HUMAN RESOURCE INFORMATION SYSTEMS

Basics, Applications, and Future Directions

4th Edition

Editors
Michael J. Kavanagh
Richard D. Johnson

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SAGE Publishing

Human Resource Information Systems

Fourth Edition

To my wife, Barbara, and my sons Sean, Colin, and Timothy, and especially to my granddaughter, Isabella

—M. J. K.

To my wife, Kelley, and my daughters, Rachel and Katherine

—R. D. J.

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Preface

In his book *Good to Great,* Jim Collins notes, “Great vision without great people is irrelevant.” In a sense, this quote gets at the heart of human resources—attracting, hiring, motivating, training, and retaining the best people for your organization. However, to be truly successful in this mission, organizations have to invest in technology to support all aspects of their human resources. In this fourth edition of *Human Resource Information Systems: Basics, Applications, and Future Directions,* we have several goals. First, we want to update the text to reflect the current use of technology in organizations. The core human resource information system (HRIS), although still the center of any human resources (HR) technology investments, is no longer the only technology supporting HR. New technologies such as mobile devices and social media are driving changes in how organizations deploy technology in HR. Second, we wish to continue to improve the content and the usefulness of the content for faculty and students. Third, we continue with our goals of presenting a broad-based perspective on HRIS, one which includes a focus on developing and implementing these systems, an understanding of how these systems impact the practice of HR across a number of functions, and finally, a discussion of timely and important developments in these systems (e.g., metrics, social media, international human resource management [HRM]). Although there have been several books on HRIS published, most authors have focused only on one aspect or dimension of the HRIS field, for example, on e-HRM, Web-based HR, or the strategic deployment of HRIS in a global context.

In the preface to the first edition of this book, we note that Kavanagh et al. (1990) stated that “among the most significant changes in the field of human resources management in the past decade has been the use of computers to develop what have become known as human resource information systems (HRIS)” (p. v). We also argued that the introduction of computers to the field of HRM during the 1980s and early 1990s was a *revolutionary* change. That is, HRM paper systems in file cabinets were replaced by HRM software on mainframes and PCs. To keep up with these technological changes in HRM, companies were forced to adapt, even though it was quite expensive, in order to remain competitive in their markets. Although we have previously

suggested that the changes since the early 1990s were evolutionary, it is clear that in the past five years, we have entered another period of revolutionary change. No longer are companies purchasing an HRIS, customizing it to fit their needs, and installing it locally. Instead, today organizations are moving to cloud computing where they "rent" space to maintain their data and rely on the vendors to manage and support the system. In addition, HR is taking advantage of systems outside of organizational control, such as Twitter, Facebook, Instagram, YouTube, and more to support employees throughout the employment life cycle. Thus, managers and organizations must develop policies to address this vastly different environment, where much of the data supporting HRIS is accessed remotely and often is stored on systems not under the direct control of the organization.

Along with these changes in technology, a revolution has come to the practice of human resources. By adopting software to support HR functioning, HR now has more information on employees, and can use this understanding to better attract candidates, hire better employees, and more effectively manage them. In other words, these changes have meant that there have been significant advances in the use of people resources in managerial decisions. Thus, the role of HRM has evolved so that now it is increasingly viewed as a strategic partner in the organization. In addition, the role of an HR professional is changing, and the most successful HR professionals will have both HR expertise, as well as strong knowledge and appreciation for a how a variety of technology tools can support "people practices" within HR and within the firm.

What do these changes mean for the new learner with a background in HRM or information technology (IT), who is trying to understand the HRIS field? Although it may be tempting to think that the optimal approach is to train students on the latest HRIS software and the latest trends in HRIS, in reality this would be like starting with Chapter 17 of this book and then proceeding backward through the book. Unfortunately, many people do, in fact, focus on learning the actual software tool itself (e.g., the HRIS) and the technological advances in HRIS without understanding the basics first. The approach we take in this book, and one we recommend, is to start with an understanding of the *evolutional* changes to technology and how these changes have transformed HR practices (e.g., how HRM moved from using paper records

in file cabinets to the computerization of the HR function), and how this interplay between technology and human resources has changed, and will continue to change, the field of HRIS. Only after understanding these changes will the learner be able to effectively understand how advances in technology can help their organization manage their HR function more effectively.

New Aspects of the Fourth Edition

As we do in each edition of the text, we have made substantial revisions in response to feedback from adopters and advances in the field of HRIS. Consistent with the previous version of the text, we have four main parts to the book, but we have adjusted the chapters to more directly relate to the themes of

- HRIS: The Backbone of Modern HR
- Managing HRIS Implementations
- Electronic Human Resource Management (eHRM)
- Advanced HRIS Applications and Future Trends

In our first section, we discuss the modern HRIS, the role that databases play in HRIS, and the key IT architectures and people who interact with the HRIS. Chapter 1 has been rewritten to more clearly describe how technology is transforming human resources, define what an HRIS is, discuss how an HRIS contributes to HR functioning, and the advantages and risks of using HRIS. In our second section, “Managing HRIS Implementations,” we focus on the development and implementation of an HRIS in an organizational setting. Chapters 6 and 9 from the previous edition were combined with a greater focus on change management and systems implementation issues (Chapter 6). The major motivation for this change is that with the increased influence of cloud-based systems, fewer and fewer organizations are choosing to build or customize HR software. Thus, success is increasingly dependent upon strong change management processes.

Section 3 focuses on eHRM, or the management and delivery of HR functionality enabled by technology. In this section, each chapter focuses on a major functional area of human resources (e.g., recruitment, selection,

training, etc.) and discusses how technology is changing its practice. In addition, these chapters bring in some of the latest research-based recommendations for using HR technology. In Chapter 11, we welcome aboard Steven Charlier, who has brought in some of the latest research findings on e-learning to inform the recommendations made in the e-learning chapter.

The final section of our book focuses on advanced HRIS topics. The chapters in this section have undergone substantial changes. Miguel Olivas-Luján has joined the authors of the international HRIS chapter and has updated the chapter to more fully bring out the issues associated with implementing HRIS in a global organization. Chapter 14 (previously Chapter 7) has been updated to bring out the importance of the decision-making processes to metrics, as well as provide fuller examples of the use of metrics in staffing. Stephanie Black is has joined us in this edition and has contributed a new chapter on the role of social media in HR (Chapter 16). This is an important and timely topic as many organizations are embracing social media despite the potential risks involved. Finally, Chapter 17 has been updated with a discussion of the latest trends in HR and HRIS that will shape the future of the field.

In addition, we have added a number of "industry briefs" to several chapters in the book. In each industry brief, leaders briefly discuss the importance of the chapter's topic and how it plays out in their firm or industry. Continued positive feedback has contributed to our decision to retain our feature "HRIS in Action." We did these things to improve the text as a learning and teaching tool—we wanted the text and each chapter within it to present a complete learning experience. Thus, we also continued the consistent structure across all chapters that was introduced in the previous edition. Chapters contain, in the following order, (1) an editors' note, (2) chapter objectives, (3) chapter content, (4) chapter summary, (5) a list of key terms, (6) chapter discussion questions, (7) a case with student discussion questions, and (8) the industry brief (where included). This internal *consistency* for each chapter was established by emphasizing the same chapter learning points for the chapter objectives, chapter summary, key terms, and chapter discussion questions. We felt that this within-chapter consistency would aid the learning process of the students and aid the faculty in identifying the important content of each chapter. Likewise, the websites and additional readings have been expanded

because of recent changes in the field. In determining to make these changes in the book, the coeditors worked to make the fourth edition a textbook they would personally be comfortable using to teach their HRIS courses.

Fourth Edition Summary

In summary, in this fourth edition, we have described the major advances in the field of HRIS and the relation of HRIS to managerial decision making while, at the same time, exploring the basic concepts of developing, implementing, and maintaining an HRIS. The book represents the intersection of the best thinking and concepts from the two fields of HRM and IT. It was the early intersection of these two fields that changed the role of HR in organizations from record keeper to strategic partner. After introducing the basic concepts of an HRIS combined with new approaches to the operation of HRM in the organization, we then proceed to the more advanced, and evolutionary, technical changes. The basic philosophy of this book is that the integration or harmonization of technology with people management in an HRIS will create a distinct competitive advantage for organizations. We hope that you, the reader, gain this understanding and that you enjoy this book.

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—Michael J. Kavanagh and Richard D. Johnson

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Part I Human Resource Information Systems (HRIS): The Backbone of Modern HR

1 A Brief History and Overview of Technology in HR

Richard D. Johnson

Michael J. Kavanagh

Editors' Note

The purpose of this chapter is to provide an introduction to the field of human resource information systems (HRIS), which lies at the intersection of human resource management (HRM) and information technology (IT). A central focus of this chapter is the use of data from the HRIS in support of managerial decision making. The chapter starts with a brief discussion of HRIS and electronic human resource management (eHRM). The history of the field of HRM and the impact of information technology on HRM is covered, as well as the advent of using a human resource information system and the subsequent effects on both HR and IT professionals. The different types of HR activities will be discussed as well as the different types of information systems used in HRIS. The chapter will also discuss the role of an HRIS within this broader organization environment, particularly its alignment with HR and organizational goals. This first chapter lays the groundwork for the remainder of this book, and, consequently, it is important to understand thoroughly the concepts and ideas presented. This chapter contains definitions for a number of terms in common use in the HRM, IT, and HRIS fields. (Note that a glossary defining these terms is also provided at the back of this book.) The central themes of this book in terms of the development, implementation, and use of an HRIS will also be discussed. A brief overview of the major sections of the book will be presented here as well, one discussing how each chapter is an integral part of the entire field of HRIS. Finally, you should note that the key terms used in this chapter are in bold and contained in a section after the chapter summary. The pattern of sections for this chapter will be consistent for all chapters of this book.

Chapter Objectives

After completing this chapter, you should be able to

- Describe the three types of HR activities
- Explain the purpose and nature of an HRIS
- Describe the differences between eHRM and HRIS
- Explain the value and risks associated with the use of an HRIS
- Describe the different types of HRIS
- Describe the historical evolution of HRM, including the changing role of the HR professional
- Discuss the evolution of the technology of HRIS
- Discuss how the information from an HRIS can assist organizational decision making
- Understand how HRM and HRIS fit within a comprehensive model of organizational functioning in global business environments

HRIS In Action

Situation Description

To illustrate the importance and use of human resource information systems in contemporary human resources departments, this vignette examines the typical memoranda that may appear in the inbox of HR professionals and managers. Assume you are the HR director of a medium-size organization that primarily maintains and uses manual HR records and systems. This morning, your inbox contains the following memos that *require action today*.

> *Memo 1:* A note from the legal department indicates that some female staff members have filed an employment discrimination complaint with the local government agency responsible for the enforcement of equal opportunity employment. The female staff members allege that, for the past 10 years, they have been passed over for promotion because they are women. In order to respond to this allegation, the legal department requires historical data on the promotions of both males and females for

the past 10 years for all jobs in the company broken down by department. It also needs the training records for all managers involved in personnel actions, such as promotions, to ascertain whether or not they have received training in equal employment provisions, especially in terms of unfair gender discrimination.

Memo 2: The second item is a complaint from employees working in a remote location of the company, about 150 miles away. The employees are complaining that their pay slips are not reaching them on time and that they are finding it difficult to get timely and accurate information on the most recent leave and benefits policies of the company.

Memo 3: A letter from the marketing manager states that he has not received any updated information on the status of his request, made three months ago, to recruit a new salesperson. The failure to recruit and hire a new salesperson has had a negative effect on the overall sales of the company's products over the past quarter.

Memo 4: A letter from the HR professional in charge of the southwest regional office says that she is swamped with HR administrative work, particularly personnel transactions on employees. As a result, she has not been able to meet employees in her region to describe and begin to implement the recent Employee Engagement Initiative as required by corporate headquarters.

Memo 5: A note from one of the production managers indicates that he has received a resignation letter from a highly regarded production engineer. She is resigning because she has not received the training on new technology that she was promised when hired. She notes that most of the other production engineers have attended this training program and have had very positive reactions to it.

Memo 6: A strongly worded note from the director of finance asks the HR department to justify the increasing costs associated with its operation. The note indicates that the HR director needs to develop a business plan for the overall operation of the HR department to include business plans for all of the HR programs, such as recruiting and training. Further, the finance director indicates that unless the business cases can demonstrate a positive cost-benefit ratio, the budget for the HR department will be reduced, which will lead to reductions in the HR department professional staff.

As the HR director, your first thought may be to resign since searching for the information required by these memos in the manual records on employees will require several days if not weeks to complete. However, you have just returned from a professional conference sponsored by the Society for Human Resource Management (SHRM) and remember how an HRIS may be what you need! As this chapter and the ones that follow will illustrate, an HRIS enables an HR department to streamline its activities and the demands placed on it by automating the HR data and processes necessary for the management of the human capital of the organization. This automation helps develop the capabilities to produce information and reports on the requests contained in the memos in the vignette, and these reports will facilitate efficient and effective managerial decision making. While an HRIS cannot make the judgment calls in terms of whom to recruit or promote, it can certainly facilitate better inputting, integration, and use of employee data, which will reduce the administrative burden of keeping detailed records and should aid and enhance decisions about strategic directions.

Need for an HRIS in Decision Situations

If you read the above memos again, you will recognize that each one has a request for human resource management information that will be used in a decision situation. The information requested in Memo 1 will help the legal department determine the company's potential liability in a workplace gender discrimination situation. This information may help to determine whether the company should decide to rectify the situation in terms of an informal settlement with the female staff members or to defend the company's promotion procedures as valid—in court if necessary. The information required in Memo 2 may help the HR department decide to change its payroll procedures as well as its distribution of benefits information to remote company locations. The information needed to respond to Memo 3 will impact decisions by the HR department to change recruitment and selection programs. The response to Memo 4 clearly suggests the need for the acquisition of an HRIS. The information required to answer Memo 5 may help in decisions regarding the revision of recruiting and training procedures, especially for new engineers. The information that would be provided in response to Memo 6 will help decide the future of the HR department. As you go through this book, look at information on the capabilities of various

human resource information systems, trying to find an HRIS that would allow you (as the HR director) to respond to each of the six memos in one day.

Introduction

> *It's kind of fun to do the impossible.*
>
> —Walt Disney

What do you think is keeping CEOs up at night? Although you might think that it may be issues such as increasing stock price and market share, navigating and surviving in a globally competitive environment, or government regulation, according to a recent *Harvard Business Review* article (Groysberg & Connolly, 2015) the most often mentioned concerns facing their organization are talent related. CEOs are worried about hiring the right individuals; how to properly develop, promote, and retain top talent; and how the employees represent the firm.

To maintain a competitive advantage in the marketplace, firms need to balance their physical, organizational, and human resources to achieve, profit, and survive. Leading management thinkers (i.e., Drucker, Dyson, Handy, Saffo, & Senge, 1997; Porter, 1990) argue that **human resource management (HRM)** will be the most critical and most challenging for organizations in the 21st century. The most effective and well-respected companies today have innovative and valuable people practices. These organizations know that human resources (HR) cannot afford to simply focus on completing day-to-day activities, but instead, they should focus on outcomes and capabilities that align with the broader organizational goals (Ulrich, Younger, & Brockbank, 2008).

But to do this, they need timely and accurate information on current employees and potential employees in the labor market. The ability of organizations to do this has been greatly enhanced through the use of **human resource information systems (HRIS).** A basic assumption behind this book

is that the effective management of employee information for decision makers will be the critical process that helps a firm maximize the use of its human resources and maintain competitiveness in its market.

HR Activities

The goals of HR are to attract, motivate, develop, and retain employees. Typical HR responsibilities involve things such as record keeping, recruiting, selection, training, performance management, employee relations, and compensation. Within each functional area, activities can be classified as transactional, traditional, or transformational (Wright, McMahan, Snell, & Gerhart, 1998). **Transactional HR activities** involve day-to-day transactions such as record keeping—for example, entering payroll information, tracking employee status changes, and the administration of employee benefits. These activities are the costliest and most time-consuming activities that HR undertakes. Wright et al. (1998) estimate that most HR departments spend approximately 65% to 75% of their time on them. **Traditional HR activities** involve HR programs such as planning, recruiting, selection, training, compensation, and performance management. HR departments spend about 15% to 30% of their time on these activities. Traditional activities can have strategic value for the organization if their results or outcomes are consistent with the strategic goals of the organization. **Transformational HR activities** are those activities that add value to the organization—for example, cultural or organizational change, structural realignment, strategic redirection, and increasing innovation. Because of the time and effort to complete transactional and traditional activities, HR departments typically spend only 5% to 15% of their time on transformational activities.

One of the major purposes of the design, development, and implementation of an HRIS is to reduce the amount of time HR employees have to spend on transactional activities, allowing the staff to spend more time on traditional and transformational activities. This notion of using technology to improve transactional activities and accomplish them more efficiently is the central theme of this book and provides one of the primary justifications for a computer-based system. In later chapters that discuss various HR programs such as selection and training, we will see how a computer-based system can aid in both traditional and transformational activities to make them consistent

with the strategic goals of the organization.

Technology and Human Resources

What Is an HRIS?

Since the 1940s, technology has been used to support HR processing. In fact, the earliest organizational systems were built to support payroll processing due to increasing tax regulations. But, despite its early start, the complexity and data intensiveness of the HRM function has led to it being one of the last management functions to be automated (Bussler & Davis, 2001/2002). This fact does not mean that an HRIS is not important; it just indicates the difficulty of developing and implementing systems in HR compared with other business functions—for example, accounting and supply chain systems. Only recently has HR embraced the use of technology, with estimates suggesting that now nearly all large organizations have implemented systems to support HR processes and functions (CedarCrestone, 2014). These systems can support activities such as online applications, Internet-based selection testing, management of employee information, support of training, succession planning, and more. As a whole, these systems are broadly referred to as human resource information systems. A sample employee home screen for an HRIS is shown in Figure 1.1.

Figure 1.1 SuccessFactors Employee Home Screen

Source: © SuccessFactors, Inc. All rights reserved.

An HRIS is defined as an information system that is focused on supporting HR functions and activities, as well as broader organizational “people” processes. A more formalized definition of an HRIS is a system used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organization’s human resources to support HRM and managerial decisions. An HRIS is not simply computer hardware and associated HR-related software. It requires cooperation among departments for its best use. That is, in addition to hardware and software, it also includes people, forms, policies and procedures, and data. The major difference between a traditional information system and an HRIS is that the HRIS contains data about people in the organization and can become both the face of HR and the initial system with which new employees interact with the firm.

Note, an information system does not have to include computers. Many small businesses utilize paper-based systems (e.g., stored in files or folders), because historically, the expense of implementing an HRIS were beyond their financial capabilities. Thus, if you work for a small organization, you may find that much of the information in HR is paper based. However, the expense and time associated with paper means that most organizations will invest in technology to support HR. As organizations choose to implement an

HRIS, the paper-based systems become the basis upon which the new HRIS is evaluated. For the purpose of this book, however, we will use the term *HRIS* to refer to a computerized system designed to manage the company's HR.

There are three main ways that an HRIS can add value to HR and the organization. First, by automating processes or transactions, it provides information to help HR conduct their transactional activities more efficiently. Second, by providing *accurate and timely information* to the HR personnel and managers, it can help them make better decisions. Finally, by providing more information, by helping HR reshape practices, and by freeing up HR employees' time, HRIS can help HR more fully support the strategic mission of the firm. For example, HR can provide better information used to support planning for needed employees in a merger, to identify potential discrimination problems in hiring, or to evaluate the effectiveness of programs, policies, or practices (Dulebohn & Johnson, 2013).

eHRM and HRIS

The implementation of an HRIS has brought with it an opportunity for HR to update and change their processes to be technology enabled. This technology-enabled collection of HR processes has been called **electronic human resource management (eHRM)** and reflects a new way of "doing" HR. eHRM uses information technology, particularly the Web, as the central component of delivering efficient and effective HR services. This can be best seen through the words of Gueutal and Stone (2005): "Things will look a bit different here. No longer will you deal with an HR professional. . . . The HR portal will take care of you" (p. xv). Essentially, technology becomes the nerve center for disseminating, connecting, and conducting human resources (Strohmeier, 2007). Organizations embracing an eHRM approach don't simply utilize technology in the support of human resources but instead see technology as enabling the HR function to be done differently by modifying "information flows, social interaction patterns, and communication processes" (Stone & Lukaszewski, 2009, p. 136). It has also been defined as the "implementation and delivery of HR functionality enabled by a[n] HRIS that connects employees, applicants, mangers, and the decisions they make" (Johnson, Lukaszewski, & Stone, 2016, p. 536).

Whereas eHRM is a way of conducting HR, the HRIS is the technology through which eHRM is enabled. An HRIS can include technologies such as databases, small functional systems focused on a single HR application (e.g., performance management), or a large-scale, integrated **enterprise resource planning (ERP) software** package and Web-based applications. In today's environment, it can even be devices such as smartphones and social networking tools that enable employees to access HR data remotely or to connect with others in the organization. Another way of looking at the differences between eHRM and HRIS is that eHRM tends to be more focused on how HR functionality is delivered, and an HRIS is more focused on the systems and technology underlying the design and acquisition of systems supporting the move to eHRM.

The Value and Risks of HRIS

An HRIS can add value to HR in many different ways. Research has shown that HR technology can lead to dramatic cost and time savings for organizations. Advantages of HRIS include

- providing a comprehensive information picture as a single, integrated database; this enables organizations to provide structural connectivity across units and activities and to increase the speed of information transactions (Lengnick-Hall & Lengnick-Hall, 2006);
- increasing competitiveness by improving HR operations and management processes;
- improved timeliness and quality of decision making;
- streamlining and enhancing the efficiency and effectiveness of HR administrative functions;
- shifting the focus of HR from the processing of transactions to strategic HRM; and
- improving employee satisfaction by delivering HR services more quickly and accurately.

Specific examples of cost savings include

- reduction of salary planning cycle by over 50% (Gherson & Jackson, 2001),

- reduction of 25% in HR staffing headcount when implementing self-service (Gueutal & Falbe, 2005),
- reduction of 25% in recruiting cycle time (Cober, Brown, Blumenthal, Doverspike, & Levy, 2000),
- reduction of recruitment costs by up to 95% (Cober et al., 2000), and
- training cost reductions of 40%–60% with e-learning (Gill, 2000).

The ability of firms to harness the potential of HRIS depends on a variety of factors, such as

- the size of the organization, with large firms generally reaping greater benefits;
- the amount of top management support and commitment;
- the availability of resources (time, money, and personnel);
- the HR philosophy of the company as well as its vision, organizational culture, structure, and systems;
- managerial competence in cross-functional decision making, employee involvement, and coaching; and
- the ability and motivation of employees in adopting change, such as increased automation across and between functions (Ngai & Wat, 2004).

The implementation of an HRIS doesn't come without risks, though. As with any information system, there are potential dysfunctional impacts that may occur when an HRIS is implemented (Stone, Stone-Romero, & Lukaszewski, 2003). These include the following:

- Management by computer and substitution of technology for human judgment: Managers may begin to base performance evaluations exclusively from the data captured by the HRIS. Thus, soft skill behaviors such as teamwork and customer service may not be fully considered.
- Privacy concerns: Employees and applicants may feel that their data are being accessed and used by those internal and external to the organization.
- System rigidity and lack of flexibility: Standardization of HR processes can benefit the organization, but some systems may not allow for the inevitable exceptions that arise and as the HR legal environment changes.

- Employee stress and resistance to the use of electronic performance monitoring.
- Performance reduction in complex tasks when performance monitoring systems are used.

Types of HRIS

Although there are multiple typologies for the classification of computer-based systems, we are going to define the most basic types of systems that are most readily applied to the HR context. One of the most common ways of categorizing information systems is to focus on what level of organizational processing the system supports: daily operations, managerial functioning, executive-level processes and strategies, and those that span organizational levels. Table 1.1 catalogs the major types of systems, their major focus and goals, and examples of how they can be used to support HR. As you go through this book, these systems and their HR examples will be discussed, and you should refer back to this table as needed.

TABLE 1.1 ■ Information Systems Providing Support for HRM

Organizational Level	Type of System	Major Goals and Focus	HRM Examples
Operational	Transaction Processing System	Improves transaction speed and accuracy Improves efficiency in the processing of daily business transactions Automates routine transactions Reduces transaction costs	Payroll processing Time and attendance entry Online creation and dissemination of application forms
Managerial	Management Information System	Provides key data to managers Supports regular and ongoing decisions Provides defined and ad hoc reporting	Producing EE03 reports Calculating yield ratios for recruiting Calculating per capita merit increases
Executive	Executive Information System	Provides aggregate, high-level data Helps managers with long-range planning Supports strategic direction and decisions	Succession planning Aggregate data on balanced scorecard
Boundary Spanning	Decision Support System	Supports interactive and iterative managerial decision making Supports forecasting and "what-if" analysis Supports business simulations	Staffing needs assessment Labor market analysis Employee skills assessment
	Expert System	Embeds human knowledge into information systems Automates decisions with technology	Resume keyword searches
	Office Automation Systems	Enables designing documents Enables scheduling shared resources Facilitates communication	E-mail training-room scheduling
	Collaboration Technologies	Supports electronic communication and collaboration between employees Supports virtual teams	Communication support for e-learning Online meetings and shared documents HR departmental wikis
	Enterprise Resources Planning System	Integrates and centralizes corporate data Shares data across functional boundaries Provides single data source and common technology architecture	OrangeHRM Oracle/PeopleSoft Lawson HRM SAP

Evolution of HRM and HRIS

To fully understand the current state of technology in HR and its role in organizations, it is important to understand both the evolution of HR and the technologies supporting HR. The historical analysis that follows will demonstrate the growing importance of employees from being just one of the replaceable parts in organizations in the 20th century industrial economy to being a key source of sustainable competitive advantage in the 21st century knowledge economy. This means examining the evolution of HRM intertwined with developments in IT and describing how IT has played an increasing role in HRM. This historical analysis will show how the role of HRM in the firm has changed over time from primarily being concerned with routine transactional activities and the utilization of simple, inflexible systems to the support of more strategic activities through the use of flexible, mobile, and Web-deployed systems. This evolution is illustrated in Figure 1.2 and will become evident as we trace the historical evolution of HRM in terms of five broad phases of the historical development of industry in the United States. For more information on this historical development, we encourage readers to consult Johnson et al. (2016).

Pre–World War II

In the early 20th century and prior to World War II, the personnel function (the precursor of human resources management) was primarily involved in clerical record keeping of employee information; in other words, it fulfilled a **"caretaker" function.** During this period, the prevailing management philosophy was called **scientific management**. The central thrust of scientific management was to maximize employee productivity. It was thought that there was *one best way* to do any work, and this best way was determined through time and motion studies that investigated the most efficient use of human capabilities in the production process. Then, the work could be divided into pieces, and the number of tasks to be completed by a worker during an average workday could be computed. These findings formed the basis of piece-rate pay systems, which were seen as the most efficient way to motivate employees at that time.

Figure 1.2 Historical Evolution of HRM and HRIS

At this point in history, there were very few government influences in employment relations; consequently, employment terms, practices, and conditions were left to the owners of the firm. As a result, abuses such as child labor and unsafe working conditions were common. Some employers set up labor welfare and administration departments to look after the interests of workers by maintaining records on health and safety as well as recording hours worked and payroll. It is interesting to note that record keeping is one of the major functions built into the design of an HRIS today; however, there simply was no computer technology to automate the records at this time in history. Of course, paper records were kept, and we can still see paper record HR systems in many smaller firms today.

Post–World War II (1945–1960)

The mobilization and utilization of labor during the war had a great impact on the development of the personnel function. Managers realized that employee productivity and motivation had a significant impact on the profitability of the firm. The human relations movement after the war emphasized that employees were motivated not just by money, but also by social and psychological factors, such as receiving recognition for work accomplished

or for the achievement of work goals.

Due to the need for the classification of large numbers of individuals in military service during the war, systematic efforts began to classify workers around occupational categories to improve recruitment and selection procedures. The central aspect of these classification systems was the **job description**, which listed the tasks, duties, and responsibilities of any individual who held the job in question. These job description classification systems could also be used to design appropriate compensation programs, evaluate individual employee performance, and provide a basis for termination.

Because of the abusive worker practices prior to the war, employees started forming trade unions, which played an important role in bargaining for better employment terms and conditions. There were significant numbers of employment laws enacted in the United States that allowed the establishment of labor unions and defined their scope in relationship with management. Thus, personnel departments had to assume considerably more record keeping and reporting to governmental agencies. Because of these trends, the personnel department had to establish specialist divisions, such as recruitment, labor relations, training and benefits, and government relations.

With its changing and expanding role, the typical personnel department started keeping increasing numbers and types of employee records, and computer technology began to emerge as a possible way to store and retrieve employee information. In some cases in the defense industry, **job analysis** and classification data were inputted into computers to better understand, plan, and use employee skills against needs. For example, the U.S. Air Force conducted a thorough and systematic job analysis and classification through its Air Force Human Resources Laboratory (AFHRL), which resulted in a comprehensive occupational structure. The AFHRL collected data from thousands in jobs within the Air Force, and, through the use of a computer software program called the Comprehensive Occupational Data Analysis Program (CODAP), it was able to establish more accurately a job description classification system for Air Force jobs.

During this time, large firms began investing in technology to keep track of payroll, but due to the complexity and expense of computers, only the largest

organizations, such as GE, could afford to develop these systems in house. In addition, companies such as ADP were founded as payroll outsourcers and used mainframe computers to support payroll processing.

With increasing legislation on employment relations and employee unionization, industrial relations became one of the main foci of the personnel department. Union-management bargaining over employment contracts dominated the activity of the department, and these negotiations were not computer based. Record keeping was still done manually despite the growing use of computerized data processing in other departments, such as accounts and materials management. What resulted was an initial reluctance among personnel departments to acquire and use computer technology for their programs. This had a long-term effect in many firms when it came to adopting advancements in computer technology, even though this technology got cheaper and easier to use.

Social Issues Era (1963–1980)

This period witnessed an unprecedented increase in the amount of labor legislation in the United States, legislation that governed various parts of the employment relationship, such as the prohibition of discriminatory practices, the promotion of occupational health and safety, the provision of retirement benefits, and tax regulation. As a result, the personnel department was burdened with the additional responsibility of legislative compliance that required collection, analysis, and reporting of voluminous data to statutory authorities. For example, to demonstrate that there was no unfair discrimination in employment practices, a personnel department had to diligently collect, analyze, and store data pertaining to *all* employment functions, such as recruitment, training, compensation, and benefits. To avoid the threat of punitive damages for noncompliance, it had to ensure that the data were comprehensive, accurate, and up to date, which made it essential to automate the data collection, analysis, and report generation process. As you go through the chapters of this book, these varying laws and government guidelines will be covered within the specific HR topics.

It was about this time that personnel departments were beginning to be called human resources departments, and the field of human resource management

was born. The increasing need to be in compliance with numerous employee protection laws or suffer significant monetary penalties made senior managers aware of the importance of HRM. In other words, HRM practices were starting to affect the “bottom line” of the firms, so there was a significant growth of HR departments.

Additionally, computer technology had advanced to the point where it could deliver better productivity at lower costs and was beginning to be used more widely. The decreasing costs of computer technology versus the increasing costs of employee compensation and benefits made the acquisition of computer-based HR systems (HRIS) a necessary business decision. As a result, there was an increasing demand for HR departments to adopt computer technology to process employee information more effectively and efficiently. These technology developments and increased vendor activity led to the development of a comprehensive **management information system (MIS)** for HRM. In addition, early forms of integrated systems were being developed by SAP, the precursor to the modern ERP. But interestingly, HR was still slow in adopting computer technology. Thus, the major issue at this time in the historical development of HRIS was not the need for increased capabilities of technology, but how to best implement it.

Cost-Effectiveness Era (1980–Early 1990s)

With increasing competition from emerging European and Asian economies, U.S. and other multinational firms increased their focus on cost reduction through automation and other productivity improvement measures. In HR, administrative burdens intensified with the need to fulfill a growing number of legislative requirements, while the overall functional focus shifted from employee administration to employee development and involvement. To improve effectiveness and efficiency in service delivery through cost reduction and value-added services, the HR departments came under pressure to harness technology that was becoming cheaper and more powerful.

In addition, there was a growing realization within management that people costs were a very significant part of a company’s budget. Some companies estimated that personnel costs were as high as 80% of their operating costs. As a result, there was a growing demand on the HRM function to cost justify

their employee programs and services. In one of the first books to address this growing need to cost justify the HRM function, Cascio (1984) indicates that the language of business is dollars and cents, and HR managers need to realize this fact. But the challenge facing HR was that most leaders were not thinking like business managers (Fitz-enz, 1980).

Technology was becoming more cost-effective, and an increasing number of organizations were increasingly able to afford using them. In addition, organizations began networking computers together, and the development of microcomputers (e.g., PCs) allowed organizations to leverage the power of both the mainframe and local computer to support HR operations. This allowed managers and employees to have HR information directly available on their workstations. This approach to computing was called client-server computing. Specifically, client-server computing supported the processing and use of HR data on both the mainframe computer as well as on the local personal computer of an employee. Organizations could now distribute employee information to multiple locations throughout the organization, providing more current information to managers in support of their personnel decisions. An early leader in this space was PeopleSoft, who developed one of the first, and most popular, HRIS during this time.

As noted earlier, the prevailing management thinking regarding the use of computers in HR was not that their use would result in a reduction in the number of employees needed in HR departments, but that employee activities and time could be shifted from transactional record keeping to more transformational activities that would add value to the organization. This change in the function of HRM could then be clearly measured in terms of **cost-benefit ratios (CBR)** to the bottom line of the company.

ERPs and Strategic HRM (1990–2010)

The economic landscape underwent radical changes throughout the 1990s with increasing globalization, technological breakthroughs (particularly Internet-enabled Web services), and hyper competition. Business process reengineering exercises became more common and frequent, resulting in several initiatives, such as the rightsizing of employee numbers, reducing the layers of management, reducing the bureaucracy of organizational structures,

creating autonomous work teams, and **outsourcing.** Firms today realize that innovative and creative employees who hold the key to organizational knowledge provide a sustainable competitive advantage because, unlike other resources, intellectual capital is difficult for competitors to imitate. Accordingly, the people management function became strategic and was geared to attract, retain, and engage talent. These developments led to the creation of the **HR balanced scorecard** (Becker, Huselid, & Ulrich, 2001; Huselid, Becker, & Beatty, 2005), as well as to added emphasis on the **return on investment (ROI)** of the HR function and its programs (Cascio, 2000; Fitz-enz, 2000, 2002).

With the growing importance and recognition of people and people management in contemporary organizations, **strategic human resource management (strategic HRM)** became critically important in management thinking and practice. Human resources and the intellectual capital of employees were increasingly viewed as a strategic asset and a competitive advantage in improving organizational performance (Becker & Huselid, 2006). Organizations became more aware that there was not one best way to strategically deploy HR resources. Thus, researchers increasingly emphasized the **"best-fit" approach to strategic HRM** as opposed to the **"best-practice" approach to strategic HRM**. They argued that it was "the fit between the HR architecture and the strategic capabilities and business processes that implement strategy that is the basis of HR's contribution to competitive advantage" (Becker & Huselid, 2006, p. 899).

A good example of the importance of HR and the information provided by an HRIS can be found in the **human resource planning (HRP)** function. HRP is primarily concerned with forecasting the need for additional employees in the future and the availability of those employees either inside or external to the company. Imagine, for example, that a company is considering a strategic decision to expand by establishing a production facility in a new location. Using the data from an HRIS, HRP can provide estimates of whether or not there are enough internal employees or individuals in the external labor market of the new location available with the necessary skills to staff the new facility.

Another critical characteristic of strategic HRM is the adoption and use of

HR metrics (Cascio, 2000; Lawler & Mohrman, 2003). Most functional departments of an organization have utilized metrics for decades due to the nature of their business transactions. For example, the marketing department has set sales goals and the effectiveness metric that is used is the percentage of sales relative to the goal. But, for HR, the focus on the measurement of the cost-effectiveness of programs is relatively recent. Despite the recent utilization of metrics, their use continues to grow and has deepened as organizations seek to compete globally.

During this timeframe, the technology supporting HR also underwent a dramatic transformation. In the late 1990s, software vendors began developing integrated enterprise resource planning systems, which integrated data from multiple functional areas of business, such as finance, accounting, marketing, HR, production, and sales. Industry leaders in this area were PeopleSoft, SAP, and Oracle. Other vendors focused on one specific HR function (such as time and attendance, online recruiting, or payroll). This approach where the organization would purchase the best system for each functional area became known as best of breed. Some industry leaders who chose this approach were Kronos for time and attendance, ADP for payroll, and Taleo for online recruiting.

"The Cloud" and Mobile Technologies (2010–Present)

Within the last few years, we have seen an additional shift in HR, and much of this has been technology and regulation dependent. In 2010, the **Patient Protection and Affordable Care Act** was passed, and with it a host of new healthcare regulations were placed on organizations. In addition, a number of new data requirements were needed by organizations to ensure compliance with this act. Thus, the data needs for organizations continue to grow.

In addition, the technology supporting HR continues to evolve. Rather than the traditional ERP, organizations are increasingly moving to cloud-based HR systems, which are accessible over mobile devices and which leverage the capabilities of social networking and Web 2.0 tools. This creates a new hurdle for HR professionals as they learn to navigate the distribution of data

on many more types of devices and on systems that are internally controlled by HR and by those systems outside of organizational control (e.g., Twitter, Facebook, Instagram, etc.).

Ultimately as we will see in the ensuing chapters, although technology is a key enabler of strategic HRM, it is not simply the best technology and best strategy that leads to competitive advantage, but rather the fit between the environmental realities, technology, and strategic practices that lead to competitive advantage. A critical aspect of an HRIS in supporting the implementation of organizational strategy is how we can use data to make more effective decisions about employees, programs, and initiatives.

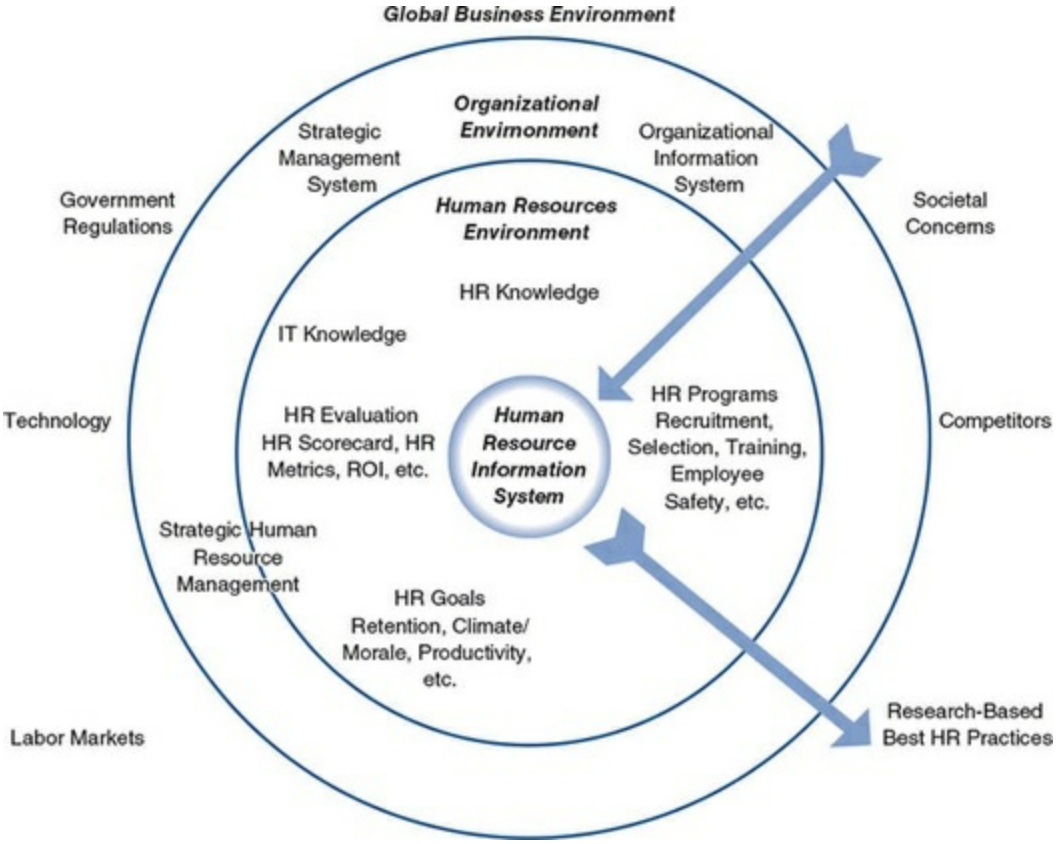
HRIS Within the Broader Organization and Environment

Beyond supporting and providing data for human resources, an effectively designed HRIS must also interface with individuals and systems within the broader organization and organizational environment. The data centrality of the HRIS is pictured in Figure 1.3. There are several aspects of this model that are critical. First, this model is a framework to use in reading, organizing, and understanding the information given in this book. At the core is the HRIS. The next layer focuses on the human resources environment and the major components of that environment (e.g., HR programs). Outside of this figure represents the organizational environment and its components. Outside the organizational environment is the global business environment, which directly influences the organizational environment and indirectly affects the HR environment. Each of these layers mutually influences each other and together can impact the development and implementation of the HRIS. For example, differing labor laws across countries mean that different HR policies may be implemented and may affect the type of data collected by the HRIS and reported to regulatory agencies in different companies. The figure also indicates the interrelatedness between the strategic management system; the strategic HRM system; and the performance, business, and HR goals that are generated during the strategic planning process.

Second, this is a systems model; that is, it is organic and can change over

time, as the environment changes (e.g., the increasing focus on unfair discrimination in society and in the workforce will affect the HR environment and will, in turn, affect the organizational and global business environments). Third, the HRIS and the HR program evaluation results, in terms of HR metrics and cost-benefit results (value added and return on investment), are in continual interaction. This emphasis is consistent with current thinking in the HRM field (Cascio, 2000; Fitz-enz, 2000, 2002) and has generated the HR workforce scorecard (Becker et al., 2001; Huselid et al., 2005). Finally, as will be emphasized throughout this book, the *alignment* between the global business environment, the strategic management system, the strategic HR management system, the business goals, the HR goals, and the HR programs is critical to the organization's maintenance of its competitiveness in the market (Evans & Davis, 2005; Huselid, Jackson, & Schuler, 1997).

Figure 1.3 Overview of an HRIS Embedded in Organizational and Global Business Environments



Themes of the Book

The *overall theme* of this book is that the HR and IT operate jointly with HR processes and people to provide accurate and timely information in support of HR and operational and strategic managerial decision making. The book itself is broken into four major themes, each with a different focus:

- *Part I: System Aspects of HRIS.* In this section, you will learn about databases and the different technical and design considerations underlying HRIS.
- *Part II: Implementation of the HRIS.* In this section, you will learn about the systems development process, change management, assessing the feasibility of an HRIS, and how to implement them.
- *Part III: eHRM.* In this section, you will learn about how technology has transformed the administration of HR as well as how it has transformed the various functions of HR.
- *Part IV: Advanced HRIS Topics.* In this section, you will learn about advanced topics such as including international considerations in HRIS, workforce analytics, privacy and security, and social media. In concludes with a look forward to the future of HRIS and technologies that are on the cutting edge.

Summary

The primary purpose of this chapter was to introduce the field of human resource information systems to readers. The field of HRIS has evolved greatly from simply automating simple HR transactions such as cutting a payroll check to one of assisting HR in becoming a strategic partner with the organization. The result of this is that HRIS have evolved from simple mainframe systems with limited capabilities to large-scale integrated, mobile systems that support social networking capabilities. In addition, the use of HRIS has allowed HR to rethink how HR functionality is deployed, leading to an eHRM approach. The distinction between HRIS and eHRM was explained to help the reader avoid confusing these terms when they appear in the remainder of the book. Additionally, the role of HRIS within the broader organization and environment and its mutually influencing role were discussed. Finally, the chapter briefly discussed four major themes covered within the book. This chapter therefore serves as an introduction to the field of HRIS and serves as a foundation for the sections and chapters that follow.

Key Terms

Discussion Questions

1. What are the factors that changed the primary role of HRM from a caretaker of records to a strategic partner?
2. Describe the historical evolution of HRM and HRIS in terms of the changing role of HRM and the influence of computer technology on HRM.
3. What is required for the effective management of human resources in a firm to gain a competitive advantage in the marketplace?
4. Describe the emergence of strategic HRM and the influence of computer technology. What are some of the approaches used in HRM to facilitate the use of strategic HRM in a firm's business strategy?

5. How does technology help deliver transactional, traditional, and transformational HR activities more efficiently and effectively?
6. Justify the need for an HRIS.
7. Describe and differentiate the major types of information systems.

Case Study: Position Description and Specification for an HRIS Administrator

One way to assess the nature and importance of a particular function or position in an organization is to examine the job description and job specifications for this position, as they tell us what activities, duties, and tasks are involved in the job as well as what knowledge, skills, and abilities (KSA) are required to perform the job. The following is an actual advertisement for an HRIS administrator. A large corporation placed this ad in the "Job Central" section of the website for the International Association for Human Resources Information Management1 (www.ihrim.org).

HRIS Administrator

Job Level: Senior (5+ Years), Full time
Reports to: Senior Director of Human Resources Operations

Position Summary

MOMIRI, LLC is an Alabama Native Owned Corporation, providing shared services to the MOMIRI family of companies and planning and incubating the next generation of companies serving federal and commercial customers. MOMIRI companies offer core expertise in telecommunications, information technology, product development, major program management, open source software, construction management, facility operations, and operations support. MOMIRI companies realize that quality personnel are the key to our success. An excellent benefits package, professional working environment, and outstanding leaders are all keys to retaining top professionals.

Primary Function

The incumbent will serve as a key member of the HR Support Services department and provide professional human resources support in specific functions or disciplines to management and staff for the MOMIRI family of companies. This position is viewed as going to a midlevel professional who assists management and staff with HR programs at the tactical level and performs all essential duties and responsibilities at the direction of the Manager of HR Operations.

Essential Duties and Responsibilities

- Provides technical assistance to senior-level HR staff and management on several HR programs to include employee relations, compensation, EEO compliance, company policies and procedures, disability programs (STD, LTD, FMLA, ADA), federal and state employment laws, and personnel actions as needed.
- Supports and maintains the Human Resources Information System (HRIS) in addition to other systems supported by the management of enterprise applications.
- Serves as technical point-of-contact for assigned functional areas and assists subject matter experts with ensuring data integrity, testing of system changes, report writing and analyzing data flows for process improvement opportunities.
- Supports HRIS and other enterprise systems' upgrades, patches, testing, and other technical projects as assigned.
- Recommends process/customer service improvements, innovative solutions, policy changes, and/or major variations from established policy.
- Serves as key systems liaison with other departments and process stakeholders (e.g., Payroll).
- Writes, maintains, and supports a variety of reports or queries utilizing appropriate reporting tools. Assists in development of standard reports for ongoing customer needs.
- Maintains data integrity in ATS, HRIS, and other enterprise systems by running queries and analyzing and fully auditing data across all HR

departments.
- Conducts new hire in-processing to include systems training for new employees and entering new employee information in Costpoint.
- Conducts termination out-processing to include entering employee separation information in Costpoint and reporting attrition data.
- Develops user procedures, guidelines, and documentation for HR-related systems. Trains system users on new processes/functionality.
- Provides HR tools and resources for management and staff to accomplish their goals and objectives.
- Processes personnel actions (hires, terminations, pay and title changes, promotions, employment status, etc.) to include entering data into HRIS.
- Assists with special HR-related projects and provides training to other staff members as required.
- Performs other duties as assigned.

Requirements

Specialized Knowledge and Skills

- Experience working with a multiple-site workforce.
- Working knowledge of federal and state employment laws and related acts.
- Advanced to expert level computer skills.
- Excellent verbal and written communication and presentation skills.
- Great interpersonal skills.
- Strong time-management and prioritization skills.

Qualifications

- Bachelor’s degree in HR and/or equivalent professional experience.
- 3–5 years of technical HRIS experience in professional HR environment.
- Self-directed, highly responsive, and detail oriented.
- Ability to maintain absolute confidentiality in all business matters.
- Government contracting experience is a plus.

Case Study Questions

1. How does this position help the HR function become a strategic partner of the organization?
2. From the position description, identify the traditional, transactional, and transformational HR activities that this position is involved with.
3. Using the key responsibilities identified for this position, explain why and how the HRIS function plays a pivotal role in the organizational model as described in this chapter.

1. The name of the company in the advertisement has been changed.

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2 Database Concepts and Applications in HRIS

Janet H. Marler

Barry D. Floyd

Editors' Note

As mentioned in the book overview in Chapter 1, this chapter is focused on understanding databases and the applications of IT to the development and use of an HRIS. Databases are the backbone of all HRIS and a basic understanding of their creation, structure, and use will help students better understand the data capabilities and limitations of an HRIS. The chapter briefly reviews the history of data and databases. The chapter next reviews the relational database management system and discusses the key terms, concepts, and design issues associated with it. The chapter closes with a discussion of business intelligence and data mining applications in HR. This section helps acquaint the reader with an overview of this critical area of growing importance to organizations. Although this chapter may be a review for some students, the material in it is critical to understanding the remaining chapters of the book. As such, students may want to refer to this chapter as they are studying subsequent chapters. This introductory chapter is also an excellent example of the contribution of IT to the field of HRM in building an HRIS.

Chapter Objectives

After completing this chapter, you should be able to

- Discuss the difference between data, information, and knowledge
- Identify problems with early database structures
- Understand what a relational database is and why it is better than older database structures
- Discuss three types of data sharing and why they are important
- Know where data in a database are stored
- Know the different ways in which data can be delivered to the end user
- Know what a query is and discuss three different types of queries
- Discuss how queries are used to support decision making
- Discuss the key steps involved in designing a simple database in Microsoft (MS) Access
- Identify key data fields in an HR database
- Understand the difference between operational databases and a data warehouse
- Discuss how business intelligence software, data analytics, and Big Data can support HR decision making

Introduction

> *In God we trust, all others must bring data.*
>
> —W. Edwards Deming

Whether an organization purchases, leases, or develops its human resource information system (HRIS), the data and the information it produces are stored in and retrieved from a database. Today's HRIS have as their foundation electronic databases that work in conjunction with **business applications** to transform data into information that is essential for business operations and for decision making. Many believe that managing electronic databases and turning data into accessible and actionable information is a

competency necessary to succeed in today's marketplace. Indeed, data are produced, stored, updated, and shared by human resources (HR) employees and managers on a daily basis. This process is so pervasive that it often goes unnoticed. Yet the effective collection, storage, integration, and use of data are essential for any business, and the most successful organizations are masters of this process!

In this chapter, we provide an insight into how commercially delivered HRIS databases work. We define key **relational database** terminology, describe how a database is structured, and show how to develop a basic database using MS Access, a basic **database management system (DBMS)**, as an example. We discuss how DBMSs provide the capability to integrate HR data and to link this data with other data essential to the operations of a business. We close by providing examples of HRIS built on MS Access to provide a basic understanding of larger more complex commercially developed HRIS databases.

Data, Information, and Knowledge

Data are the lifeblood of an organization. The production and maintenance of data are critical to the smooth operation of every part of the organization. Data represent the "facts" of transactions that occur on a daily basis. A transaction can be thought of as an event of consequence, such as hiring a new employee for a particular position for a specified salary. The organization attempts to capture the data (facts) associated with each of these transactions, such as the date hired, the name of the person hired, the title of the position, the location where the new hire will work, and so on, and then store these data for future use.

Information on the other hand is the interpretation of these data. An interpretation of data always has some goal and context such as making a hiring decision for a particular department or understanding the performance of an employee to make a promotion decision. Note that sometimes the data themselves can be informative without any additional transformation (e.g., the salary range of the job). But other times, we must do additional work (e.g., calculating totals or presenting the data in some order) to turn the data into information to answer important questions such as "What is our full-time

employee headcount in Corporate Sales?" or "Which employee should be promoted?"

Knowledge is information that has been given meaning (Whitehill, 1997). Knowledge is different from data and information. More than *what* and *why*, knowledge is about *how*. Knowledge, therefore, consists of the procedures one follows to use data and information to make decisions and conduct business. In many instances, such procedural knowledge is mostly hidden, residing in the minds of individuals and groups in the organization. For example, in HRIS, facts about age, gender, and education are the data. Information created from these data includes average age, gender ratio, and number and types of graduates at the business unit level. Such data and information help HR managers plan recruitment, schedule training programs to bridge skill gaps, and identify whether there may be employee discrimination. Knowledge represents how HR managers can execute the recruitment plan, decide which training programs are best to bridge skill gaps or determine what to do if employee discrimination exists. In the HR function, *data* about employees and jobs are the foundation of most of the *information* that is critical to analyzing and making HR decisions. *Knowledge*, on the other hand, constitutes knowing what information is needed from a database and how to use it to achieve HR objectives.

Database Management Systems

A DBMS is a set of software applications (i.e., computer programs) combined with a database. DBMS electronically allows organizations to effectively manage data. Managing data means

- identifying the data needed to create information that is necessary to make HR decisions;
- defining the characteristics of those data (e.g., number data vs. character data);
- organizing those data in a manner that promotes integration, data quality, and accessibility; and finally
- restricting access to the data to the right personnel.

By performing these functions effectively, a DBMS turns data into an

organizational resource.

A database is a set of organized data. Importantly, it is a permanent, self-descriptive store of interrelated data items that can be processed by one or more business applications. *Self-descriptive* means that the database knows about the characteristics of the data (e.g., the length of an employee's last name can be no greater than 30 characters) or that a paycheck can only be associated with one employee. *Interrelated* means that there are links between different sets of data in the database. For example, there can be a link between the data about employees and the jobs that they have. There can also be links between HR data and other data in the organization such as linking a managerial position to specific company facility resources such as office space or a production facility. As a central repository of data, many different business applications and users can access the data, making an organization's database a very valuable organizational asset and, therefore, it needs to be managed appropriately.

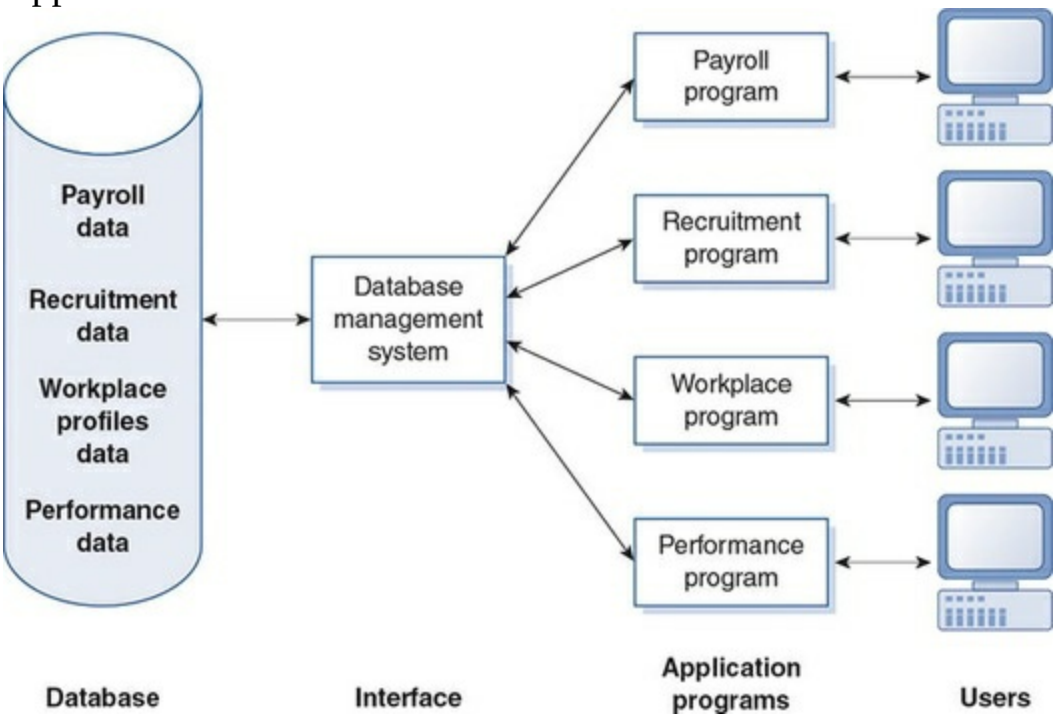
The main functions of a DBMS are to create the database; insert, read, update, and delete database data; maintain data integrity (i.e., making sure that the data are correct) and security (i.e., making sure that only the right people have access to the data); and prevent data from being lost by providing backup and recovery capabilities. Database management systems are also designed to have high performance, allowing data to be retrieved quickly by the many users in the organization.

DBMSs and databases work in conjunction with business applications, such as **transaction processing systems (TPS)**, to make organizations run smoothly. As shown in Figure 2.1, these business applications consist of a set of one or more computer programs that serve as an intermediary between the user and the DBMS, while providing the functions or tasks that the user wants performed (e.g., store data about a new hire; Kroenke & Auer, 2014). The business application must talk both to the user sitting at a computer terminal in an easy-to-use manner and to the database in a way that is very efficient. For example, a payroll business application involves collecting data from an employee's time card, storing these data in a database, and then retrieving and manipulating these data to produce a paycheck. Data from this transaction processing system can also be used to generate **reports** on

monthly personnel expenses. These reports are the basis of **management reporting systems (MRS)**. We'll talk more about these later in the chapter.

There are thousands of commercially available business applications that work in conjunction with a DBMS to process business transactions. In a 2000 census of comprehensive HR software for the HR function, Richard Frantzreb catalogued more than 150 HR applications (Meade, 2003). In another census of specialized HR products under headings such as employment management, equal employment opportunity (EEO), training management, career development, HR planning, performance management, personnel policy, survey processing, employee scheduling, attendance/timekeeping, payroll, and so on, Frantzreb counted 2,500 HR software products from about 1,700 vendors (Meade, 2003). Recent innovations in HRIS technologies including improvements in user experience, increased integration, and increased functionalities such as social and mobile computing are leading many companies today to acquire new software to meet their needs (Bersin by Deloitte, 2013).

Figure 2.1 Database, Database Management System, and Business Applications



Early DBMSs[1]

[1] For a more detailed discussion, see Hansen and Hansen (1996, pp. 52–56).

Early DBMSs were simply data-processing systems that performed record-keeping functions that mimicked existing manual procedures. Thus, electronic data were stored in computers in much the same way that they were stored in paper filing systems. Paper filing systems typically consisted of a filing cabinet and a drawer for each type of business document (e.g., an employee personnel form). These documents were also called "records." Inside would be paper documents with each document being a record of a transaction (e.g., promoting Susan to senior manager). Computer systems mimicked this, creating individual computer files, typically one for each type of document. For example, there would be an Employee File with employee records, a Time Card File with time card records, multiple Employee Benefit Files with their associated documents, and so on. The main objective of these file-processing systems was to process transactions such as update payroll records and produce payroll checks as efficiently as possible. The goal was not on data sharing among different business applications and users.

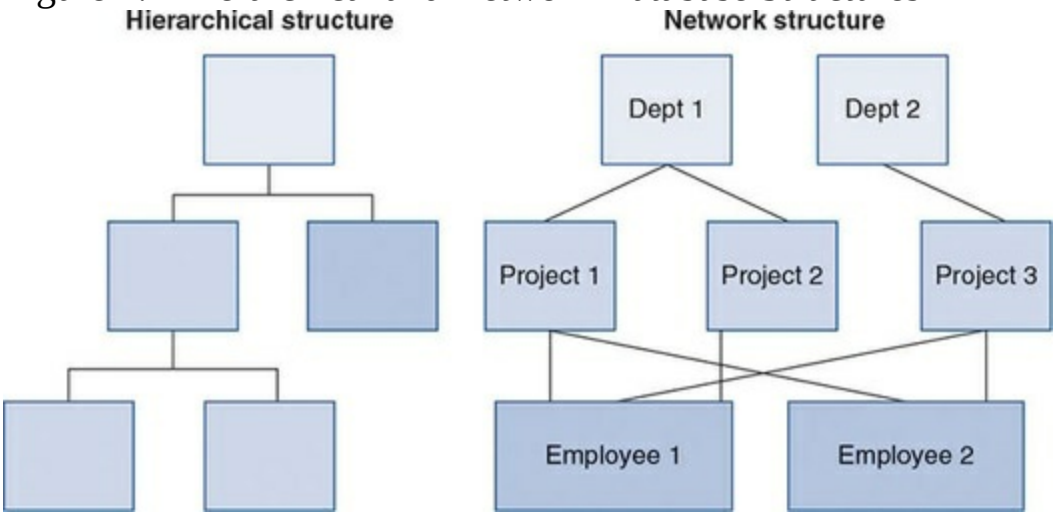
These traditional **file-oriented data structures** had a number of shortcomings. These shortcomings included (a) data redundancy—an employee's name and address could be stored in many different files; (b) poor data control—if you had access to the file you had access to *all* the data in the file, which may not be desirable because you may want to restrict the data viewed by a particular user; (c) inadequate data manipulation capabilities—it was very difficult to combine the data across files and to easily update and to add new data; and (d) excessive programming effort—any change in the structure of the data (e.g., adding a new field such as a mobile phone number or a screen name to an employee record) required extensive changes in the programming that accessed the data.

In general, early file systems were good at specialized transaction processing. They were not designed to easily and quickly provide information to answer questions such as "What was the average hourly wage for female programmers last year compared with this year?" because the data to answer the more complicated questions came from different files; for example,

employee gender and salary would be in the master file on employees, and hours worked would be in the time-card transaction file. Difficulties also arose when managers in the organization wanted to share data across applications: Fundamentally, there was no easy way to link information. For example, managers could not connect information about employee salaries and sales projections.

To overcome the shortcomings of file-oriented structures, *hierarchical and network database systems* evolved in the mid-1960s and early 1970s. The key to these systems was that **relationships** between different records were explicitly maintained. Although relationships among the data were created between sets of data, as illustrated in Figure 2.2, the relationships were created based on where the data were stored (e.g., the job records for Employee X are located in Sector 3 of Disk 4). Thus, only the very knowledgeable technical staff was able to effectively interact with the database. These database systems also required an excessive programming effort and suffered from inadequate data manipulation capabilities if the program was poorly designed.

Figure 2.2 Hierarchical and Network Database Structures



The advent of relational database management systems addressed the many problems associated with these older DBMSs and database structures.

Relational DBMSs

In 1970, E. F. Codd introduced the notion that rather than programming relationships between data based on physical location, the information needed to integrate data should reside within the data (Hansen & Hansen, 1996). Included in Codd's proposal was that data be stored in tables where each table represented one entity in the real world and the information associated with that entity be stored only in that table. For example, a company could have an employee table (i.e., employee is an entity), and so information about the employee, such as name, address, date of hire, would only be stored in that table and nowhere else. Such an idea removed problems with redundancies such as storing the employee's address in many locations and then not knowing which one is the correct one, if the employee's address is changed in one location and not in the other location. These tables were called relations, and from this model came the name *relational database.*

In relational database systems, retrieval of data from different tables was based on logical relationships built into the table structures, which made feasible the creation of a query capability that was much more accessible to end users who generally had limited programming experience. This technique also allowed for relationships to be easily built among all the entities in the organization. We'll talk more about this a bit later in the chapter.

Perhaps the most significant difference between a file-based system and a relational database system is that data are easily shared. There are three types of *data sharing:* (1) data sharing between functional units, (2) data sharing between management levels, and (3) data sharing across geographically dispersed locations. Data sharing requires a major change in end-user thinking, particularly in those employees who are accustomed to owning their own data on their PCs. Fundamentally, sharing data means sharing power because both data and information are power. Sharing data also means being a good citizen and making certain that the data you enter is correct.

Data Sharing Between Different Functions

Relational DBMSs facilitate data integration across different functions such that each function might have access not only to its own data but also to other data as well. Thus, the HR department is able to maintain its employee database, but also access cost information from the accounting department's

database. As a result, relational database technology increased the feasibility and popularity of integrated business applications. These integrated applications used in large organizations are referred to as enterprise resource planning (ERP) business applications.

ERP software applications are a set of integrated database applications, or modules, that carry out the most common business functions, including HR, general ledger, accounts payable, accounts receivable, order management, inventory control, and customer relationship management. ERP modules are integrated, primarily through a common set of definitions and a common database (Brown, DeHayes, Slater, Martin, & Perkins, 2011).

Data Sharing Between Different Levels

Operational employees, managers, and executives also share data but have different objectives and, thus, different information needs. Operational employees focus on data-processing transactions to ensure smooth operation of critical business transactions. A common business transaction is processing the information from an employee's timecard. At this level, transaction-processing information systems help conduct business on a day-to-day basis to provide timely and accurate information to managers and executives. For example, transaction-processing systems update employee work history, attendance, and work hours. Operational employees are concerned with the accuracy and efficiency with which these data are processed.

Managers, on the other hand, are more interested in summary data, such as reports generated from daily operational data that can be summarized into daily, weekly or monthly reports on hours worked by employee or absences by employee.

Executives rely on information produced at an even more aggregated level to evaluate trends and develop business strategies. For example, executives might ask for reports that compare turnover statistics across business groups and over time.

These three different levels of use correspond to three different types of

software systems that have evolved over the past three decades: transaction processing systems (TPS), management reporting systems (MRS), and **decision support systems (DSS)** (Hansen & Hansen, 1996). TPS were first applied to lower operational levels of the organization to automate manual processes such as payroll. Their basic characteristics include (a) a focus on data storage, processing, and flows at the daily operational level; (b) efficient transaction processing; and (c) summary reports for management (Sprague & Watson, 1989). Early ERP applications were used primarily for their transaction processing functionality.

Note the similarity between the categorization of information systems into **electronic data processing (EDP)**, management information systems (MIS), and DSS discussed in Chapter 1 (Sprague & Carlson, 1982). These terms correspond to TPS, MRS, and DSS in this chapter. As you may recall from Chapter 1, an additional information system was identified—the human resources management decision system (HRMDS). The HRMDS was described as consisting of the reports managers and HR professionals receive on a regular basis but that are actually used in their daily work, *particularly in their decision-making capacity.* The HRMDS could be classified as a special instance of an MRS or MIS system but focused specifically on information used in decision making—a central theme of this book.

In addition to TPS capabilities, relational databases can also provide MRS capability. Characteristics of an MRS include (1) information aimed at middle managers; (2) integration of TPS data by business functions such as manufacturing, marketing, and HR; and (3) inquiry and report generation from the database (Sprague & Watson, 1989). Management reporting systems can be designed to provide daily, monthly, quarterly, or annual summary of key transactions such as employee headcounts by department or distribution of employee absence reports to meet budgets.

Decision support systems assist senior managers and business professionals in making business decisions. Data mining, data analytics, and **business intelligence (BI)** are examples of information derived from a DSS, which relies on data warehouses. Data warehouses represent aggregated data (e.g., the total salary information by department by month) collected from various databases available to a business.

Data Sharing Across Locations

In today's global environment, access to data from any physical location in the world is increasingly important. Teams of employees may be stationed in Thailand, India, and the United States. Two issues arise when data are shared across wide geographic locations. These are (1) managing the day/time of a transaction and (2) determining where to store the various components of the business application, DBMS, and database.

To deal with day/time, developers of DBMSs such as Oracle, MS SQL Server, and IBM DB2 are building the capability to deal with recording dates and times according to the time zone in which the data originated. So, for example, if a database is stored in London and an employee records a transaction while sitting at a terminal in Los Angeles, in addition to the time (say 1 P.M. in Los Angeles), the time zone (−08:00 from Greenwich Mean Time) is also stored with the transaction.

As part of a global information system design, organizations have chosen to break their business application and DBMS into components, often called "tiers." More detail on tiers will be covered in Chapter 3. Traditional client-server architectures broke an application into two tiers, typically with the **user interface** and some business logic on the user's computer, such as a PC (the client) and the database and mainstream parts of the application stored on a server. In today's global environment with high-speed data networks, **N-tier architectures** exist with databases and applications being distributed among many different computers around the world. So if, for example, you are in an Internet café in Bangkok trying to get information about your benefit election, the hosting computer may be in London and the data may be located on a computer in Chicago. In sum, computer networks that provide instant access to these operational data are created, allowing real-time managerial decision capability regardless of physical location.

A centralized database allows a company to confine its data to a single location and, therefore, more easily control data integrity, updating, backup, query, and control access to the database. A company with many locations and telecommuters, however, must develop a communications infrastructure to facilitate data sharing over a wide geographical area. The advent of the

Internet and a standardized communication protocol made the centralized database structures and geographically dispersed data sharing feasible.

Key Relational Database Terminology

As discussed earlier, relational DBMSs are used to store data important to the organization. Key terms in relational database management include entities, attributes, tables, primary keys, foreign keys, relationships, queries, forms, and reports. Below we define each term and describe its function in a database.

Entities and Attributes

Entities are things such as employees, jobs, promotion transactions, positions in company, and so on. They include both physical things such as desks and conceptual things such as bank accounts. A company must analyze its business operations and identify all the entities that it believes are important.

Each of these entities is made up of attributes. An attribute is a characteristic of the entity. For example, an employee has a name, address, phone number, education, and so on. Attributes also have characteristics such as the type of data (e.g., date, number, or character) and size (e.g., number of characters or the largest number that can be stored).

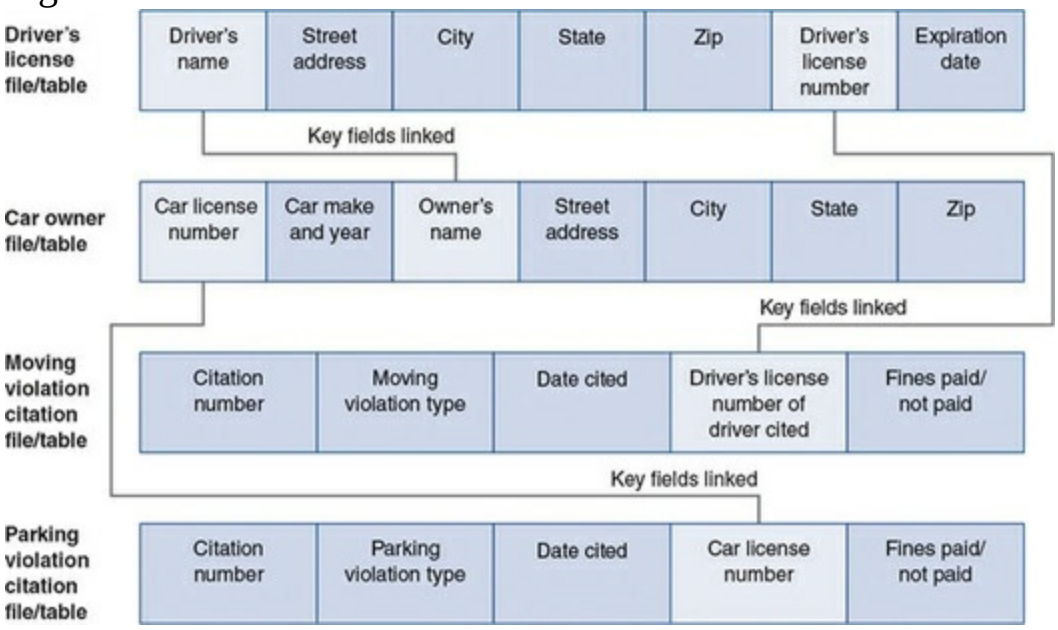
In addition to identifying the entities and attributes, the relationships among the entities must be defined. For example, a company may have an employee entity and a department entity. Then the company must define the relationship between the employee entity and the department entity (e.g., Does an employee have to be assigned to a department? Can an employee be assigned to more than one department?).

Tables

How does this information fit into a relational DBMS? Tables are used to store information about entities. As illustrated in Figure 2.3, one table is created for each entity—in this example, driver table, car table, moving

violation table, and parking violation table. Attributes are stored as the columns (also called fields) in the table. As noted earlier, attributes represent a single data element or characteristic of the data table. For example, a table of driver data would have the following columns or characteristics: first name, last name, street address, city, state, driver license number, expiration, and so on. Each of these characteristics represents an attribute or field of the table.

Figure 2.3 Relational Database Structure



Each table in a database contains rows. Rows are also referred to as records and represent an “instance” of the entity. For example, in the driver table, each row contains data about a particular driver, and each column contains data that represent an attribute of that driver, such as name, phone number, and license number.

Relationships, Primary Keys, and Foreign Keys

To represent the relationships among the tables, we have to do a bit more work. In a relational DBMS, relationships are created by having the same attribute in each table with the value of the attribute being the same in each table. Most often, this is done by taking the primary key of one table and including it in the related table. What is a primary key?

Typically, each entity has an attribute that has unique values for each instance of the entity. For example, each employee has a unique Social Security number. Other entities, such as jobs, locations, and positions can be assigned a unique number if one doesn't exist. These unique attributes can be used as a table's **primary key.** Given that we have a unique attribute, to create a relationship, we simply store that attribute in the related table. So, if an employee is associated with a position, we have two tables, an employee table and a position table. We then take the primary key of the employee table and store it in the position table. In the example in Figure 2.3, the driver's license number is the primary key in the driver table, and it is also stored in the moving violation table. When a primary key from one table is stored as an attribute of another table, that attribute is called a **foreign key.** Thus, in Figure 2.3, driver's license is the primary key in the driver table and is the foreign key in the moving violations table.

Storing data in related tables allows users to utilize the database application to create queries, forms, and reports that permit users to retrieve, update, or analyze data from multiple tables together. The relationships between tables allow users to accurately combine information that "go together" from two (or more) tables. For example, if a manager wished to provide bonuses to his or her top salespeople, he or she would likely use data from an employee file, a sales file, and some type of compensation table.

Queries[2]

[2] For a more detailed discussion, see Cable (2013, Chapters 1, 2, and 3).

A query is a question that you ask about the data stored in a database. For example, you may want to know which employees live within a specific city. You could generate these results by scrolling through the relevant table or by sorting the table by city and then looking at the result, but this is time-consuming and you would have to do this task each time you wished to find the answer to your question. A better approach is to create a query. A query is a structured way of posing your question to the DBMS in a language it understands. This definition (e.g., show all employees with city Albany) can be saved in the database and used again and again. Importantly, each time the query is executed, it searches through the *current* table records and lists the

results. The results of a query on a table(s) are always displayed in something that looks just like another table. However, this result table is only temporary and is not stored in the database. It is important to note that queries do not store data! All data are stored in tables. Queries only report on data currently in the table.

There are three different kinds of queries: select queries, action queries, and cross-tab queries. A **select query** allows you to ask a question based on one or more tables in a database. This is the most commonly used query. These queries can be quite general or quite specific. For example, a general query might extract all employees from the database who have reached retirement age. A more specific query might retrieve employees who have reached retirement age and who live in New York and are engineers.

An **action query** performs an action on the table on which it is based. Actions include updating data in the table (e.g., increasing the base salary of all employees who were rated above average in the latest performance rating), deleting records from the table (e.g., removing employees from the employees table if they no longer work at the company), or inserting records (e.g., the query may add a new set of benefits to the benefits table). You can also use this type of query to create new tables.

A **cross-tab query** performs calculations on the values in a field and displays the results in a datasheet. The reason it is called “cross-tab” is that it *tabulates* the data for a set of descriptor attributes, contrasting them or *crossing* them in a table format. For example, we might want to see the total personnel count by gender by region. So we would see the gender on the left-hand side and the different regions listed across the top of a table. A cross-tab query could display different aspects of the data, including sums or averages or minimum or maximum values. As another example, a cross-tab query could determine headcount by department or determine pay range maximums and minimums in pay grades by department.

Select queries and cross-tab queries provide the information that managers and executives expect from IT. These queries can serve as the foundation for MRS and DSS information and decision making. Action queries, on the other hand, improve the operational efficiency of managing and maintaining a database and are most closely associated with TPS. These tasks are important

to the operational staff but of less interest to HR managers and executives.

Queries are also used as the basis for forms and reports. In addition to retrieving data, they can add, update, and delete records in tables. You can define fields in a query that perform calculations, such as sums and averages. The following list illustrates typical capabilities of queries (Cable, 2013):

- Display selected fields and records from a table
- Sort records on one or multiple fields
- Perform calculations
- Generate data for forms, reports, and other queries
- Update data in the tables of a database
- Find and display data from two or more tables
- Create new tables
- Delete records in a table based on one or more criteria

Forms[3]

[3] For a more detailed treatment, see Tutorials 4 and 5 in Adamski and Finnegan (2013).

A form is an object in a database that you can use to maintain, view, and print records in a database in a more structured manner. Although you can perform these same functions with tables and queries, forms can present data in many customized and useful ways. For example, you can design a form to look like the time sheet submitted by an employee. Well-designed forms can improve data input efficiency and accuracy. Consequently, forms represent the main mechanism for creating end-user interfaces.

A form can be based on a table, multiple tables, or queries. A form can display one record at a time or many records. Often, we select only one record and then create a nice-looking, easy-to-use layout to work with the data in that one record. To view and maintain or add data using a form, you must know how to move from field to field and from record to record. Forms provide navigation buttons that facilitate moving from field to field and from record to record. Data that are entered or changed in a form automatically change the values in the underlying table once you save the changes.

Reports

A report is a formatted presentation of data from a table, multiple tables, or queries that is created as a printout or to be viewed on screen. Data displayed in a report are dynamic, reflecting the latest data from the tables on which the report is based. Unlike forms, however, you cannot change the data or add a new record in a report. You can only view the data in a report.

Although you can print data appearing in tables, queries, and forms, reports provide you with the greatest flexibility for formatting printed output. As with forms, you can design your own reports or use a wizard to create reports automatically.[4]

[4] For a more detailed treatment, see Tutorials 4 and 6 in Adamski and Finnegan (2013).

MS Access—An Illustrative Personal Database

MS Access is a relational DBMS in which data are organized as a collection of tables. Like any relational database, the data in tables can be queried. MS Access also makes it easy to create forms and reports through the use of form or report wizards. A form or report wizard is a computer program or tool that guides you through the creation of a form by asking you a series of questions. For example, which table is the form to be created from, and which attributes do you want to be displayed on the form? The form or report is created based on your answers.

MS Access is designed for relatively small databases and assumes limited knowledge of database programming. MS Access provides the following functions (Adamski & Finnegan, 2013):

- It allows you to create databases containing tables and table relationships.
- It lets you easily add new records, change table values in existing records, and delete records.
- It contains a built-in query language, which lets you obtain immediate answers to questions you ask about your data.

- It contains a built-in report generator and report wizard, which lets you produce professional-looking, formatted reports from your data.
- It provides protection of databases through security, control, and recovery facilities.

Data in an MS Access table or query can be exported to other database applications or to spreadsheet programs such as MS Excel. Once these records are in a spreadsheet program, then further analyses may be conducted and graphs and charts constructed to enhance analytical HR metric reports. Data can be exported by simply opening the database that has the object—for example, table or query—that you want to export. Then select File, Export from the database menu. Select the type of file—for example, .xlsx—you want the object to be saved to and specify a name. Click Save. Now you can open the file in Excel. You may also link the data in the database to the spreadsheet. When the spreadsheet is opened, the most recent data from the database are retrieved and presented in the spreadsheet.

Unlike spreadsheet software programs, MS Access handles substantially more data and contains the ability to model relationships. Each MS Access database, for example, can be up to 2 GB in size and can contain up to 32,768 objects, including tables, queries, forms, reports, and so on.

Designing an MS Access Database

The design process begins with an analysis of the data and information that the users of the database will need to have stored and retrieved in order to accomplish their work. Typically, we think of work as consisting of tasks within a business process, and so we can think of the data that will be required to be stored in a database and of the information that will need to be extracted. We find out the data to be stored by interviewing the intended end users of the database. We ask about entities that they need to keep information on, the attributes of those entities, and also how the entities are related. In addition, we may watch users at work and look at the forms, reports, and other business documents that they use to be successful. Gathering copies of all existing forms and reports currently used may also act as guidelines for creating forms and reports, though sometimes our intention is to change how they are doing business, and so some of these documents

may be significantly changed or even discarded.

In general, the database design process can be broken down into several steps that are somewhat sequential but oftentimes have to be repeated until the database meets the users' needs:

- Determine what the users want from the database: What questions need to be answered? What information needs to be tracked? What reports are produced? What data are needed to provide the basis for those results?
- Identify the data fields needed to produce the required information; in doing so, we also identify rules that define the integrity of the data, including data type (number, character) and data limits (e.g., if we are storing days, we might only allow the numbers 1 to 31).
- Group related fields into tables (entities).
- Determine each table's primary key.
- Normalize the data: Make sure the data for an entity are really associated with only that entity.
- Determine how the tables are related to one another and include common keys.
- Create the relationships among the different entities and ensure referential integrity.
- Create queries to define data needs that are not handled by only looking at individual tables.
- Create reports to provide a structured view of the data.
- Create forms, and in doing so, identify a common design for the forms: Typically, we create a form for each table along with a "main menu" form that allows the user to navigate to each form associated with a table and to view queries and reports.
- Enter test data to verify the quality/accuracy of the system design.
- Test the system: Do all the queries work correctly? Are the forms easy to use? Are the end users happy?
- Enter or populate the database.

HR Database Application Using MS Access

For small companies, generally with fewer than 1,000 employees, there are commercially available HR database applications based on MS Access. One

such system, popular in the United States, is HRSource from Auxillium West (www.auxillium.com). This software product offers a wide breadth of functionality and flexibility to import and export data from and to Excel and to integrate with other database applications, particularly payroll. It provides a centralized relational database with basic transaction processing and management reporting systems.

HRSource utilizes the familiar MS Access forms as user interfaces. It allows users to create custom queries and reports. However, it also offers 70 preconfigured reports and queries. Customers also claim that with a little expertise in MS Access, they are able to mine their HR information in a way that they never could before they utilized a central database (Meade, 2003).

Other HR Databases

A few decades ago, database application programs were often written by companies for their particular use; in today's business environment, customized application programs termed *legacy systems* are being replaced by commercially developed HR systems supported by enterprise database application programs (e.g., Oracle Enterprise HCM, MySAP ERP HCM, UltiPro HR, Workday). The most well-known HR database applications can operate on various DBMS platforms (e.g., Oracle, MS SQL Server, IBM DB2). These commercial database application programs can either be licensed and installed onto computer hardware a company buys themselves or now, given the ability to share database information regardless of geographic location, some vendors of HR database applications are leasing HR DBMS and business applications to business customers. This new way of acquiring an HRIS is called **software as a service, or SaaS**. The SaaS approach to HRIS is discussed further in Chapter 3. Regardless of how complex your HRIS DBMS is, you must ensure that you know what information can be derived from any database. To know this, one must have an idea of what tables and attributes (fields) are in the database. Software vendors should be able to provide this information to end users; however, for the large complex HR applications, this may run into thousands of tables and fields! Auxillium West offers a document to prospective customers that lists the data items commonly tracked (Table 2.1; Meade, 2003).

Although the list in Table 2.1 appears to be comprehensive, in fact, it is quite sparse when compared with more complex database applications. More complex database applications will also have fields that relate to business processes other than HR, such as accounting and finance. Integrated databases allow sophisticated queries and analytical reports, such as hours spent on recruiting, recruiters' hourly pay, job board posting costs, number of positions filled, number of declined offers, number of open positions, number of voluntary terminations, and number of involuntary terminations.

TABLE 2.1 ■ Examples of Common Fields in an HR Database

Employee ID	Job Code/Title
First Name	Pay Rate Type
Last Name	Rate Effective Date
Address	Salary
City	Bonuses
State	Status
Zip Code	Category (full-time/part-time)
Home Phone Number	Contract Employee Status
Gender	Department
Ethnic Code	Office Information
Birth Date	Manager
Veteran Status	Division/Location
Visa Expiration Date	Company Property
Education	Emergency Contact
Past Employment	Time-Off Accruals
Skill Code	Benefits
Training/Certification	Work-Related Injuries
Performance Rating	Disability
Next Review Date	
Hire Date	
Termination Date	
Termination Reason	
Rehire Date as Applicable	

Data Integration: Database Warehouses, Business

Intelligence, and Data Mining

An organization's ability to generate meaningful information to make good decisions is only as good as its underlying database. As Dr. John Sullivan notes, "I have found that the largest single difference between a great HR department and an average one is the use of metrics" (Gur, 2006). Metrics are measures of organizational performance outcomes that are derived from important individual and organizational outcomes (e.g., individual job performance and absence rate). As was discussed in Chapter 1, the current emphasis in HRM is functioning as a strategic business partner. A prerequisite to this goal is the use of metrics to assess and monitor quantitative data from HRM programs like recruiting and training. The primary objective of measuring HR metrics is to improve individual and organizational effectiveness.

Much of the data used to create HR metrics come from an organization's data warehouse. A **data warehouse** is a special type of database that is optimized for reporting and analysis and is the raw material for management's decision support system. Business intelligence is a broad category of business applications and technologies for creating data warehouses to analyse and provide easy access to these data in order to help organizational users make better business decisions. BI applications include the activities of decision support systems, query and reporting, statistical analysis, forecasting, and data mining.

BI systems allow organizations to improve business performance by leveraging information about customers, suppliers, and internal business operations from databases across functions and organizational boundaries. Essentially, BI systems retrieve specified data from multiple databases, including old legacy file database systems, and store these data into a new database, which becomes that data warehouse. The data in the data warehouse can then be accessed via queries and used to uncover patterns and diagnose problems.

Patterns in large data sets are identified through data mining, which involves statistically analyzing large datasets to identify recurring relationships. For example, data mining an employee database might reveal that most

employees reside within a group of particular ZIP codes. This may help if the organization wants to supply transportation or encourage carpooling. Data mining is relatively new to business analytics and has not yet been widely used for HRM decisions.

BI systems also provide reporting tools and interfaces (e.g., forms) that distribute the information to Excel spreadsheets, Internet-based portals, PDF files, or hard copies. These results can also be distributed to key executives in specialized formats known as executive dashboards, which are becoming a popular executive decision support tool.

A major reason for a DBMS is to provide information from various parts of the organization in an ad hoc manner. Ad hoc means that a user can ask a question of the data that no one has thought about yet. The user can sign into the data and pose his or her question in the form of a query. This is a very powerful concept that enables all levels of the organization. Data warehouses and BI software enable managers to create information from an even greater store of data.

Big Data and NOSQL Databases

Successful organizations realize that data-driven decision making is key to organizational success, but to achieve this success, and as a result, they are capturing increasing amounts of transactional data. However, they also realize that capturing the data is not enough: They must better manage this data. **Big Data** is a term that illustrates the challenges faced by organizations. Big Data is described by four dimensions: volume, variety, velocity, and veracity. **Volume** refers to the amount of data, often measured in terabytes that organizations collect today. Most large organizations in the United States have at least 100 terabytes of data. The HR function produces and consumes increasing amounts of data on activities such as payroll, talent management, social media, email, I-9 forms, and so on. **Variety** refers to the different forms of data. Although relational DBMSs provide a very structured view of a critical segment of HR data, HR managers also need to store and access unstructured documents such as resumes, performance reviews, disciplinary actions, images, video email, and many others. In fact, Gartner estimates that 80% of the information generated today consists of unstructured data

(Bridgwater, 2010)! **Velocity** refers to the speed at which data is coming into the organization. Sensors that track employees movement, audit logs of information access, and many other sources of information stream with increasing speed and must be captured and stored. Lapses resulting in missing data may be problematic for organizations striving to meet regulatory obligations. **Veracity** refers to the quality of the data collected by the organizations. HR is plagued by inconsistencies and inaccuracies, and these problems must be fixed in order for planning and prediction to be meaningful (Vorhauser-Smith, 2014). When these problems are fixed for structured data, HR will then be able to embrace the wealth of value found in the relatively unstructured data present in market and social data.

To manage unstructured data, organizations are turning to different database approaches to support these different data forms. For example, MondgoDB (http://mongodb.com) is an open source, document-oriented database that stores data using JSON (JavaScript Object Notation). Figure 2.4 shows the creation of an object named *Alexx,* which can have any number of properties such as age, hometown, gender, and so on. MongoDB is designed to allow users to create these objects in a flexible fashion (e.g., one could create another object named Steve that has the same properties plus other ones such as height and eye color). MongoDB is an example of a NOSQL (not only SQL) database. NOSQL are databases where data are stored and retrieved using different methods than SQL. Importantly systems like MondgoDB provide a very flexible means of describing, storing, and retrieving documents whose structure does not fit well into a relational table scheme.

For HR to be successful in meeting the challenges of Big Data, though, HR employees must develop new skill sets, ones with a “data scientist” perspective and capable of mastering HR analytics. This effort will not be accomplished overnight. “It takes organizations between five and eight years to put necessary people, processes and infrastructure in place in order to become a data-driven culture” (Vorhauser-Smith, 2014).

Thus, the sooner that HR invests in this expertise, the sooner they will be able to realize greater returns on the Big Data investments. More information on the use of metrics and Big Data in HR are discussed in Chapter 14.

Figure 2.4 Sample Object-Oriented Database

```
var Alexx = {
        “age” : “38”,
        “hometown” : “Boston, MA”,
        “gender” : “female”
};
```

Summary

In this chapter, we have described the key aspects of current DBMS technologies and how they work to create, store, and manage critical data about an organization. Data are transformed into information by relational DBMSs and business applications that work together. The underlying data in a database are collected from business transactions and stored in tables that are related to each other through shared fields called primary and foreign keys. Queries represent questions asked of the data and are used to access specific data stored in tables. The results of queries can be viewed in forms or reports that are customized so that the end user can better interpret the data that are retrieved from the database. More sophisticated data analyses and reports such as executive dashboards are produced from specialized databases called data warehouses and business application software called BI software.

Most HRIS rely on an underlying database. Understanding how database systems work, therefore, is relevant to HR decision makers because knowledge about how to create, store, and access data can be a key differentiator in a competitive environment. Small HR databases can be created using MS Access, or more sophisticated ones can be purchased from software vendors. There are literally hundreds of HR database business applications that create, process, and analyze HR data. The challenge is to find one that can most cost-effectively collect and share data from which meaningful information can be extracted to support making good decisions.

Key Terms

Discussion Questions

1. Explain the differences between data, information, and knowledge.
2. What are the main functions of a database management system, and how is it different from a database?
3. What were the shortcomings of early file-oriented database structures?
4. What are the three types of data sharing?
5. Define the key terms in a relational database.
6. What is the difference between a primary key and a foreign key?
7. What are the three types of queries?
8. How are forms and reports similar, and how are they different?

9. Take the list of HR database common fields and group them into tables.
10. What are the differences between data warehouses, BI, and data mining?
11. Can knowledge be turned into a database?
12. How can Big Data support HR decisions?

Case Study: Building an Applicant Database

You have been asked to create an applicant database for a small recruiting firm that specializes in recruiting HR professionals for small to medium firms. Describe the process that you would use to design this database. Use MS Access to develop a prototype of the database that you could show your manager.

Student Study Site

Visit the Student Study Site at **study.sagepub.com/kavanagh4e** for additional learning tools such as access to SAGE journal articles and related Web resources.

3 Systems Considerations in the Design of an HRIS Planning for Implementations

Michael D. Bedell

Michael L. Canniff

Editors' Note

This chapter focuses on the HRIS as one large information system. It starts with a brief discussion of the various stakeholders who must be considered during the design and implementation of a new HRIS. Next, it turns to a discussion of the various hardware and software architectures that organizations may consider when implementing an HRIS. This discussion traces the history of HRIS from early mainframe systems to today's integrated, mobile, and cloud-based systems. An important consideration for all organizations is whether to select the best software package from different vendors for each functional area of HR (e.g., best of breed) or to select a system that integrates all the functions within one large software package. The chapter touches on how organizations would integrate these best-of-breed solutions so that they integrate as seamlessly as possible. Whereas Chapter 2 focused on the key data considerations within an HRIS, this chapter focuses more on the technology and processes underlying HRIS implementation.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the different types of users or customers of the implemented HRIS and their different data needs
- Discuss the differences between the five general hardware architectures that are presented, from “dinosaur” to “cloud computing” to “bring your own device”
- Discuss, very generally, the main concepts of hardware and database security
- Discuss the “best-of-breed” approach to HRIS acquisition and the various options available for each functional area of HR
- Develop an understanding of the general steps and factors that affect system implementation
- Understand the pros and cons of implementing a changeover from one software system to another

HRIS In Action

A billion-dollar retailer with 4,000+ stores finds that it cannot move fast enough to beat out the competition. The organization’s senior management arrives at the conclusion that it would be easier to achieve the strategic goals enumerated by the board of directors if the various organizational functions would share information. Shared information would enable them to develop and deploy new actions and tactics more quickly. The CEO and president have therefore ordered the major functions to update their information systems immediately so that data sharing is possible. The senior vice presidents (SVPs) of accounting and human resources immediately conclude that the only solution is to decide jointly on an **enterprise resource planning (ERP) software**. An ERP software application is a set of integrated database applications or modules that carry out the most common business functions, including human resources, general ledger, accounts payable, accounts receivable, order management, inventory control, and customer relationship management (see www.erpsupersite.com). To speed the installation along, the SVPs decide on a rapid-implementation methodology that a company

down the street used. The goal is to have the new systems operational in nine months.

Shortly after this decision has been made, the SVP of human resources (HR) calls you into his office and tells you that you will be management sponsor for this project. You have to decide on everything. You sit back in your nice office and think:

> What's the problem with this scenario? It shouldn't be difficult to select a vendor and then borrow the methodology from down the street. It worked for them; it should work for us! We'll call a few vendors in the morning and find out about cost, time frame, and implementation methods. In the meantime, I should find out a little more about how to do this and who will be using the ERP. I remember from my information systems class in college that this is a reasonable first step when it comes to buying software.

What do you think your response would be to this inquiry? As you go through this chapter's material, keep this vignette in mind, and see if your answer changes.

Introduction

> *There are two ways of implementing a software design; one way is to make it so simple that there are obviously no deficiencies, and the other way is to make it so complicated that there are no obvious deficiencies. The first method is far more difficult.*
>
> —C.A.R. Hoare, James Martin Professor of Computing, Wolfson College

Successful implementation is the central goal of every human resource information system (HRIS) project, and it begins with a comprehensive design for the system. As the steps in the system development process are

covered in this chapter, the foundation knowledge that is critical to the implementation process will be emphasized. Only by understanding the users/customers of the HRIS, the technical possibilities, the software solution parameters, and the systems implementation process can we increase the probability that the completed software installation will adequately meet the needs of the human resource management (HRM) function and the organization. The chapter will begin by identifying the potential users and the kind of information that the HRIS will be managing and storing to facilitate decision making. The chapter will next discuss the technical infrastructure, how the technical infrastructure has evolved, and the many choices that the organization must make. After the technology is discussed, the systems implementation process will be presented.

Those who have participated in a system implementation will tell you that success is the result of careful planning, a dedicated team, top-management support, and an awareness of potential pitfalls. These same people will also tell you that the implementation process provides a host of opportunities to reengineer and systematically improve nonsoftware processes to reflect best practices in HRM. These opportunities should not be ignored, as they can benefit the organization as much as implementing the software will. Finally, the **implementation team** members will tell you that getting the system up and running was the most intense six months, year, or two years of their work life but that they learned a lot and every moment of the experience was worth the time.

There are four things that should be remembered throughout the chapter:

1. It is important to keep in mind the customer of the data, the process, and the decisions that will be made.
2. Everything about HRM is a system of processes designed to support the achievement of strategic organizational goals. The HRIS, in turn, supports and helps manage these HR processes.
3. An HRIS implementation done poorly will result in an HRIS that fails to meet the needs of the HR function.
4. Successful implementation requires careful attention to every step in the system design process. However, done well, the implementation process is full of opportunities to improve the organization and processes. More

consistent processes will contribute to enhanced organizational performance.

HRIS Customers/Users: Data Importance

Individuals who will be using the HRIS can be split into two general groups: employees and nonemployees. The employee category includes

- managers who rely on the HRIS and the data analyzed by the analyst or power user to make decisions;
- analysts or power users who use the HRIS to evaluate potential decision choices and opportunities;
- technical staff who are responsible for providing a system that is usable and up to date for each user, or clerical employees who largely engage in data entry; and
- employees who use the HRIS on a self-service basis to obtain personal information, for example, to look up paycheck information, to make choices about benefits during open enrollment, or to see how much vacation time they have available.

The nonemployee group includes potential employees, suppliers, and partners. Potential employees are those who might log in via a Web portal to search for and apply for a position. Suppliers and partners are organizations that interface with the HR function for a variety of purposes, from recruiting to benefits administration and payroll.

Employees

Managers

The managers referred to within this section may have a variety of titles: manager, director, vice president, and even CEO. What they all have in common is that their primary HRIS need is to have real-time access to accurate data that facilitate decision making with regard to their people (Miller, 1998). The HRIS provides the manager with data for performance management, recruiting and retention, team management, project

management, and employee development (Fein, 2001). The HRIS must also provide the information necessary to help the functional manager make decisions that will contribute to the achievement of the unit's strategic goals and objectives (Hendrickson, 2003). Easy access to accurate employee data enables the manager for each employee to view and engage in employee life cycle changes such as salary decisions, job requisitions, hiring, disciplinary action, promotions, and training program enrollment (Walker, 2001; Zampetti & Adamson, 2001).

Many HRIS products provide real-time reporting and screen-based historical information that can provide managers with information about their employees or their functional units. There are also several third-party software products available that provide managers with almost continuous data about the status of their unit and the organization—much as a dashboard on a car provides immediate information. The analysis of more complex situations is beyond the capabilities of many of these reporting and query tools. To facilitate decision making on complex issues, the manager, before making a decision, usually relies on the analyst or power user to complete some type of analysis.

Analysts (Power Users)

The analysts or power users are perhaps the most demanding user of the HRIS. The primary role of the analyst is to acquire as much relevant data as possible, examine it, and provide reasonable alternatives with appropriate supporting information to facilitate the decision process of the manager. The analyst is referred to as a power user because this person accesses more areas of the HRIS than almost any other user. Analysts must be proficient with reporting and query tools. Analysts must also understand the process used to collect the data, how new data are verified, and how the HRIS and the employee life cycle interact. They also need to understand the data definitions in terms of what data exist, the structure of the data, and what data fields are up to date and complete. Some HRIS also provide tools that the analyst can use to model scenarios or perform "what-if" analyses on questions of interest.

As an example, a recruiting analyst might be asked to provide a short list of potential internal candidates for a position that opened in the marketing

function of a large retailer. The potential candidates' characteristics of interest are queried and may include (1) when they were last promoted, (2) whether they have engaged in continuous personal-skills development, (3) what their undergraduate degrees were, and (4) whether they have ever expressed any interest in marketing. The analyst would query appropriate tables and develop a list of internal candidates.

Another example might have the HR analyst completing an analysis of corporate headquarters turnover to determine if a particular function or salary issue is the cause of the problem. This information would be drawn from existing reports, ad hoc queries, and available salary information. Data could be compiled into categories by salary, function, gender, or organizational level and examined to determine if the cause of the turnover can be pinpointed and then countered.

Technicians (HRIS Experts)

Technicians (HRIS experts) straddle the boundary of two functions. Their role is to ensure that appropriate HR staff members have all the access, information, and tools necessary to do their jobs. HRIS experts do this by understanding what is needed from an HR-process standpoint and then translating that into technical language, so the technical employees—programmers, database administrators, and application administrators—know exactly what to do. When the technical staff is planning to install the latest update and one of the results will be a change in functionality, the HRIS expert must take what the technical staff provides and translate that into language HR users understand, so as to indicate how processes and activities might change. For example, if an HR professional required that a new report be generated every other Tuesday, the HRIS expert would learn what data the report requires—perhaps mock the report up with the user—and then explain to the technical people how to make sure that this report is automatically generated on the time schedule.

Clerical Employees

Much like power users, clerical employees also spend a significant portion of

their day interacting with the HRIS. The difference is one of depth. The clerical employee must understand the process required to enter information into the HRIS and may also need to start the process or generate periodic reports. While clerical staff members in the HR employment department do not generally provide input about whether to hire an individual to a particular position, they bear considerable responsibility for seeing that the new employee gets paid properly. Hiring a new employee requires that someone, for example, a clerical employee, enter the appropriate information into the HRIS—such as the reporting relationship of the new employee as well as his or her benefits, salary, and direct deposit information.

Organizational Employees

Organizational employees are essentially all the other employees throughout the organization who interact with the HRIS. These employees serve in roles such as bank teller, nurse, machinist, salesperson, and accountant. These employees are not involved in human resources and are not likely to make decisions with HR data, but they may utilize the HRIS to help manage their personal information. Typically, all the employees in the organization may interface with the HRIS through a self-service Web portal or secure employee kiosk, removing the necessity of an HR clerk or staff member assisting with many routine HR record modifications (Walker, 2001). Self-service capabilities encourage employees to manage their personal HR profiles with respect to a variety of functions, such as benefit and retirement plan monitoring or computerized training, in addition to using HRIS-based systems to complete numerous personnel forms (Adamson & Zampetti, 2001; Zampetti & Adamson, 2001). Typical self-service applications are accessible most of the day throughout the week. Employees log on to the system, where their identity is authenticated and verified. Then appropriate change options are offered to the employee based on certain parameters that control the areas where the employee is allowed to make valid alterations to the HRIS—such as personnel data updates, job postings, or desired training enrollments (Adamson & Zampetti, 2001; Zampetti & Adamson, 2001). One fairly large financial-services organization noted that self-service options significantly enabled them to reduce the annual benefits open-enrollment process by reducing the paper documents generated, reducing necessary mailings, and reducing the data that had to be read and entered into the HRIS. Data entry

time alone was reduced from six to two weeks (Bedell, 2003b).

Nonemployees

Job Seekers

It is estimated that 70% to 90% of large organizations use online recruitment, and that number continues to increase (Stone, Lukaszewski, & Isenhour, 2005). Online recruiting tends to attract individuals who are well educated, Internet savvy, and searching for higher-level positions (McManus & Ferguson, 2003). Online recruitment also attracts people born since 1980, who have grown up with computers and are therefore comfortable with obtaining information on the Internet (Zusman & Landis, 2002). A successful recruitment website needs to be user-friendly and easy to navigate, while attracting candidates to apply to an organization by clearly communicating the benefits of joining it.

Typical job seekers have little or no prior information about how to interface with the HRIS and have had nearly zero training opportunities with it. Therefore, the recruiting portal needs to provide ease of use and ease of access to up-to-date job information. The Web form that is used to collect applicant data must also be reliably entered into the appropriate fields within the company's HRIS database. This online recruiting activity will facilitate searches for new employees to fill existing and future positions.

Sourcing Partner Organizations

The partner organizations to HR functions require certain information to complete their tasks. **Sourcing partner organizations** such as Monster.com, Adecco, and most executive recruiting firms require information about vacant positions, including a position description, job specifications, desired candidate competencies, potential salary range, and contact information. The information provided is limited to specific searches for open jobs and is updated as needed.

Business partners that are the recipients of decisions to outsource portions of

the HR function (e.g., benefit management firms) or that facilitate process completion on behalf of the employee (e.g., banks) require information that is related to current employees. This requirement increases the need for accurate data, training, and specialized security assurances, as employee information is leaving the organization.

Important Data

As is evident in the previous sections, each customer or user of the HRIS has slightly different needs with regard to what information he or she will be using. Some users simply input data and information, a few simply look at data and information provided in the form of reports, while a few others analyze the data and information to make decisions. What these users all have in common is that all the information is about potential and current employees with a focus on managing the organization's human capital to improve decision making and help to achieve strategic organizational goals. Specific data from the HRIS database fit into three categories:

1. Information about people, such as biographical information and competencies (knowledge, skills, abilities, and other factors)
2. Information about the organization, such as jobs, positions, job specifications, organizational structure, compensation, employee/labor relations, and legally required data
3. Data that are created as a result of the interaction of the first two categories: for example, individual job history, performance appraisals, and compensation information

HRIS Architecture

HRIS Evolution

In the early days of human resource applications (just 30 years ago), large "dinosaurs" roamed the IT landscape. These were called mainframe computers and were primarily built by International Business Machines (IBM). These large systems hosted the payroll applications for most

enterprises. Users of the mainframe system, which mainly consisted of IT personnel and HRMS administrators, executed large batch processes while directly logged onto the mainframe. Although access to the mainframe could be done via a desktop monitor, no processing was done locally. This architecture is commonly called a single-tier computing system. Everything (user interface, application processing, and data storage) resided on the mainframe and had to be accessed by the client company locally.

Client-Server (Two-Tier) Architecture

During the 1980s, it was discovered that many typical HR functions (such as employee benefits, recruiting, training) did not require such high-powered and expensive processing available on the mainframe computers. With the advent of the personal computer (PC), many of these functions could be re-allocated to the local processing power of the PC. The purpose of the **two-tier (client-server) architecture** was to spread out low-powered processing capability to the dozens of PCs now being used across the enterprise. High-performance applications such as payroll would still be run in a batch process on the mainframe (or large Unix server). Ease of computer usage was a driving factor to include individuals with lower levels of technology experience. By the end of the decade, HRIS vendors such as PeopleSoft began the power of PCs and created the two-tier/client-server) architecture (see Figure 3.1).

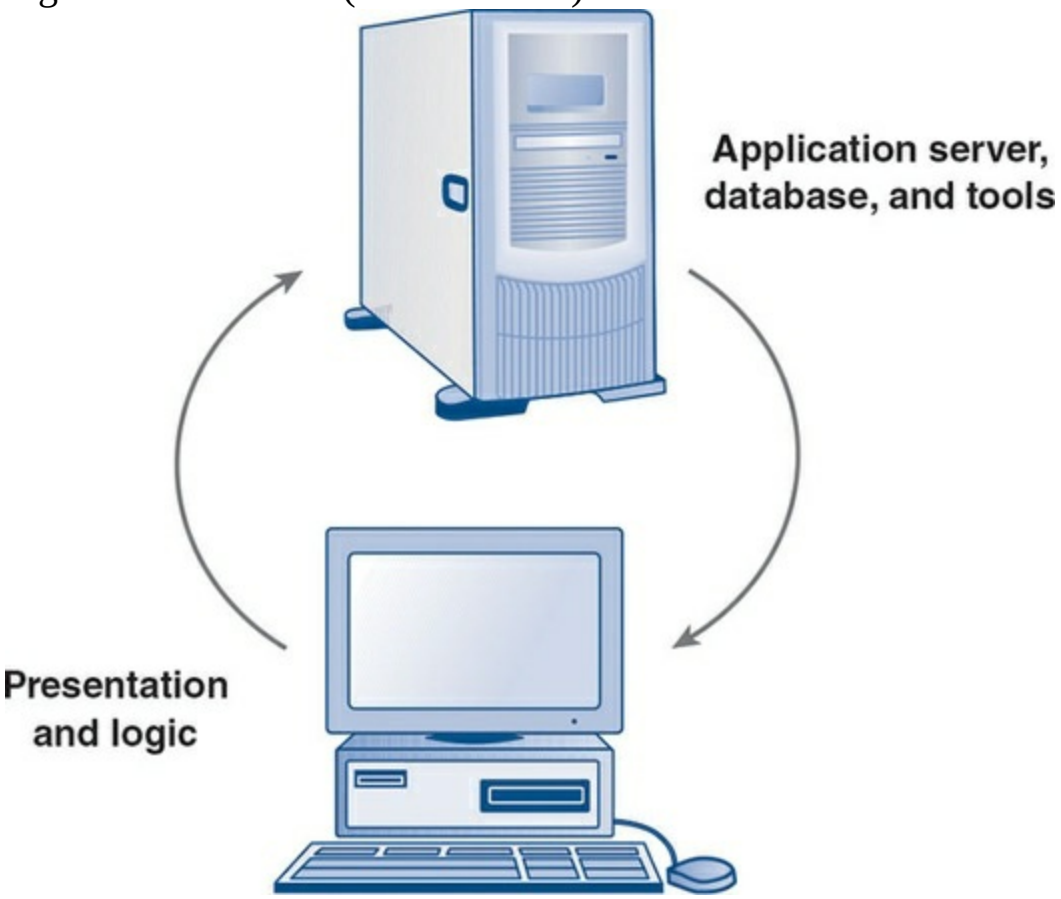
Finally, the HR software application technology could be divorced from the database technology. This separation simplified the HR application and allowed an enterprise to select the most appropriate database management system (DBMS) for their needs. Refer to Chapter 2 for comprehension discussion of DBMSs. This time period coincided with the maturation of the relational database model. This model standardizes how data are physically stored on the computer and provides standard data access via the Structured Query Language (SQL).

Three-Tier and N-Tier Architecture

From about 1995 to 2010, this division of labor concept expanded from two-

tier into three-tier and finally N-tier architectures. With a **three-tier architecture**, the “back end” servers are divided into two components—the database server and the application server (see Figure 3.2).

Figure 3.1 Two-Tier (Client-Server) Architecture



The client still managed the user interface, but more demanding processing occurred in the middle—the application server tier. For example, if two recruiters updated the same job position at the same time, a transaction processor would ensure that both updates are committed to the database (if possible). This allowed many simultaneous users to access the central database. There are a couple of drawbacks with both two-tier and three-tier systems. First, there exists a large amount of network traffic or **bandwidth** required to execute database transactions between the client and the server. Second, the user interface client needs to be installed (along with database drivers) on every PC that needs to access the HRIS (with a corollary issue being that employees need to be trained on this application). Therefore, HRIS access tended to be limited to employees within the “four walls” of the

enterprise (residing within the local area network). Low-bandwidth access, such as Internet dial-up, was impractical.

To truly provide for employee self-service (ESS) portals (discussed in detail in Chapter 10), the Web browser was adopted to solve the above issues. First, the browser created a "thin client" environment as opposed to the "thick client" environment described in the two-tier model (architecture). An Internet Web browser comes installed on all major **operating systems** (OS; e.g., Windows, Mac OS, Linux, Android). The browser's user interface has become universal. Therefore, very little employee training is required to use a browser-based application. Finally, a browser works well in a low-bandwidth network environment. So now the typical HRIS application architecture looks like Figure 3.3. A standard Web server, such as Microsoft's Internet Information Server (IIS) or Apache's Web Server, manages **HTML (Hyper Text Markup Language)** communication between the browser and the application server. And the application server also issues transactions to the centralized database server. Instead of just limiting ourselves to a four-tier label, this has been labeled N-tier architecture for the following reasons:

- It is expandable to multiple Web servers and application servers to handle **load balancing**.
- Web servers can be geographically dispersed to provide world wide access.
- Additional file servers can be added to save documents, reports, error logs, and employee data, which are generated on a daily basis.
- Multiple print servers or specialized printers can be added as needed. For example, payroll check printing requires a security enabled toner called MICR to print encoded checks for bank cashing. These check printers can be physically located in a secure environment, but connected to the HRIS N-tier architecture like any other printer.
- Additional "process schedulers" can be added to handle large batch jobs such as payroll cycles. These servers offload "heavy" processing from the main application server so that user interaction is not impacted.

Figure 3.2 Three-Tier Architecture

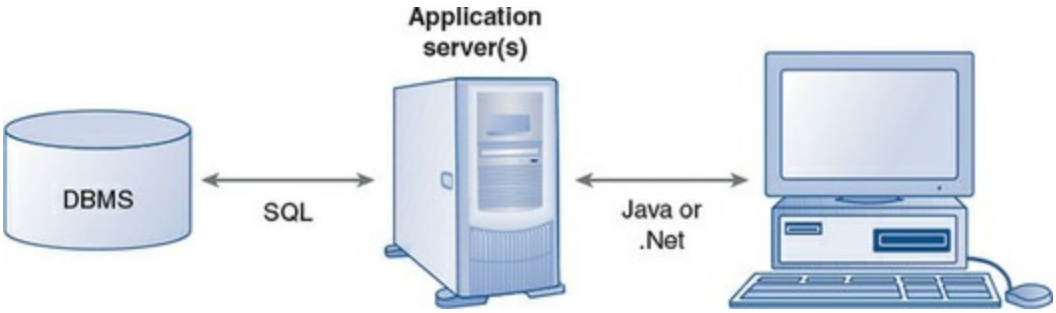
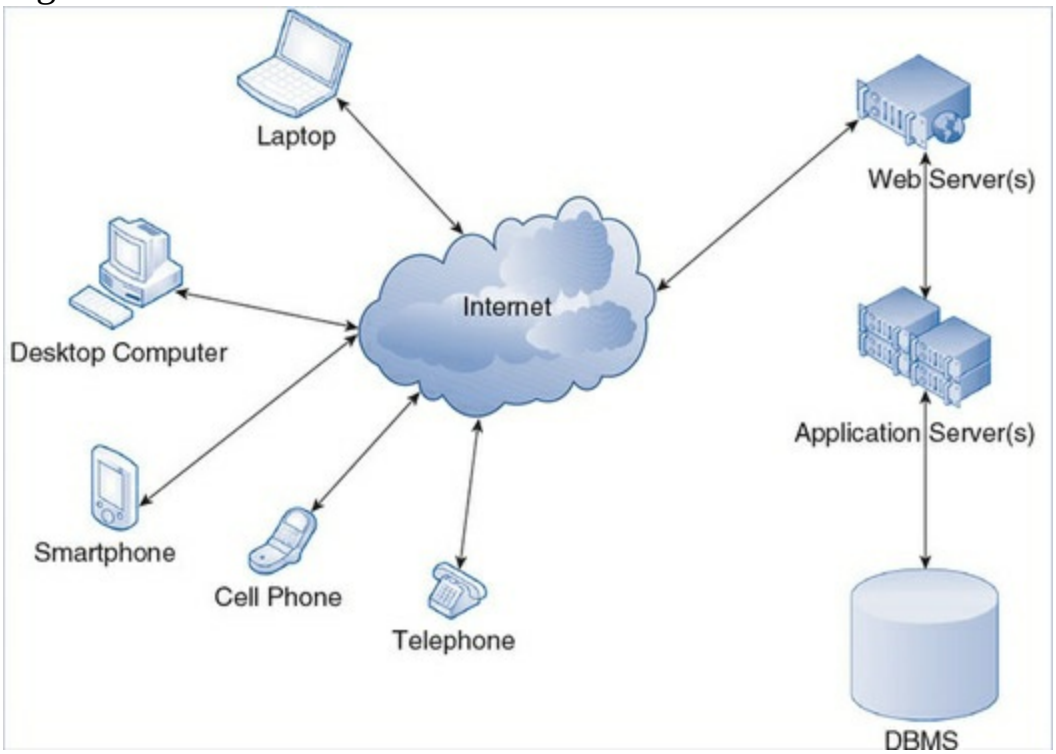


Figure 3.3 N-Tier Architecture



The architecture diagram becomes even more complicated when other ERP components are added. For example, when payroll is run, financial-related transactions need to be registered in the company's general ledger (GL) application. Typically, GL exists within the financial/accounting component of large ERP systems from SAP, Oracle, and Microsoft. Therefore, GL transactions must be interfaced between payroll and these systems. Thus additional application servers and databases enter the picture, as shown in Figure 3.3. So even though the architecture may be more complicated, the logical view of the system remains relatively simple and this complexity is hidden from the end user. For example, a consultant for a large IT services company can travel throughout the world, work with multiple clients, but still be able to record his or her time and expense reports with a single browser

application from any hotel room.

Cloud Computing—Back to the Future?!

Around 2010, a new architectural model became more prevalent, called **cloud computing**. Cloud computing can be defined as a computing architecture that uses the Internet and central remote servers to maintain data and applications. Hosted services are then delivered over the Internet. Cloud computing technology allows businesses to use applications without having to go through the complex installation process. It is notable that the "cloud" in "cloud computing" was inspired by the cloud symbol that one uses to represent the Internet in flow charts and diagrams. There exist three general service categories commonly recognized in cloud computing. These include the following:

- **Infrastructure as a Service**—This type of service basically provides access to an operating system (such as Microsoft Windows or Linux) or cluster of connected systems. For example, Amazon Web Services provides access to on-demand operating systems.
- **Platform as a Service** —The next level of services includes application and Web server technology prebuilt into the leased computer. Enterprises still build out custom applications on top of these servers. Microsoft Azure is an example of this type of service.
- **Software as a Service (SaaS)**—In this case, a complete application is delivered over the Internet. This can be as simple as an e-mail service (think Google Mail) or as complex as the entire HRIS application (see Workday, Inc. at www.workday.com) or ERP system (see NetSuite, Inc. at www.netsuite.com).

The underlying goal with cloud computing is to reduce the resources needed by companies in maintaining and running databases and applications. To achieve this, a server "cloud," or group of computers, is operated off site and accessed through the Internet. In this way, a company can utilize the processing and storage powers of these "clouds" of computers without actually having to own and invest in them. This can reduce software and equipment capital outlays as the company does not need to keep purchasing new software or hardware to keep pace with technology changes. That

investment becomes the responsibility of the vendor offering the cloud computing services. Cloud computing can be sold on demand, by the minute or the hour, and is elastic—meaning that an enterprise can consume as much or as little of a service as they want at any given time. From an accounting perspective, an enterprise leases a preset amount of computing power over an annual period. This can be budgeted in a similar manner as telephony or electrical expenses. Computing charges then become part of operational budget expense as opposed to large capital investments.

In a sense, cloud computing is a return to the single-tier model of the 1980s. Instead of a single, large mainframe running all of the applications, the Internet is acting as the "supercomputer," providing the application runtime environment. And instead of a "dumb" terminal accessing the mainframe payroll system, the browser now provides the interface to the entire set of human resources applications. In the ancient history of mainframe applications, human resources departments had to rely upon corporate data centers (or IBM) to provide high-performing and up-to-date applications. With cloud computing, the burden lies with software vendors such as Workday or Oracle's Taleo (www.oracle.com/us/products/applications/taleo/overview/index.html, a hosted recruiting and talent management solution) to provide the updating. And of course, leveraging the cloud requires solid, high-performance Internet access all of the time.

Mobile Access

Increasingly, workforces are mobile and available 24/7. Today, most people have mobile devices that have more computing power than even the fastest supercomputers in the 1980s. Mobile operating systems such as Android and iOS provide an easy to use interface that nontechnical people can navigate. Instead of companies forcing mobile devices onto their employees, enterprises encourage bring-your-own-device (BYOD) policies. Employees can access the HRIS through apps installed on their phones in a similar manner as installing consumer apps such as Facebook or Twitter. Major HRIS vendors provide apps for user friendly access to the system. Think of mobile devices as the "thin client" in the N-tier model. Tasks such as approving an expense report, viewing budget data, and managing time cards

are easily accomplished on mobile devices (from phones to tablets).

Security Challenges

Security ranks as a top priority for any human resource information system. Cloud service providers now maintain sensitive corporate data (outside of the four walls and possibly in other countries). So, when choosing a cloud solution, the evaluation process must include a thorough security analysis. Security needs to be addressed to handle the following situations:

- Exposure of sensitive payroll and benefits data between employees
- Loss of sensitive personnel data outside the enterprise (such as Social Security numbers)
- Unauthorized updates of key data such as salary amounts, stock options (both quantity and dates), and so on
- Sharing of personnel or applicant review comments with unauthorized employees
- Sharing data with external organizations and service providers

There are two auditing standards with which cloud vendors should comply. These are the Statement on Standards for Attestation Engagements #16 (SSAE 16) and ISO 27001. SSAE 16 asserts that a provider meets security process requirements and has been audited. ISO 27001 requires that a provider implements a management and control framework related to security risks. HRIS cloud providers need to pass these certifications on a regular basis. As you consider vendors, it is important to ensure that the vendor is in compliance with these standards. Security for the HRIS is so important that there is an entire chapter that covers this topic in detail. If interested at this point, read and examine Chapter 15 for a comprehensive discussion on HRIS security.

Best of Breed

An HRIS, as discussed in the previous section, often exists as one of the main parts of an overall ERP software solution for the company. Yet the HRIS is not a monolithic solution even within HR business processes. There exist

alternative software applications that solve specific HR business problems. This section addresses these types of solutions, the pros and cons of using multiple applications, and technical infrastructure. In general, an architecture that combines products from multiple vendors is called **best of breed (BOB)**.

The most well-known example of these BOB architectures comes from the audio industry—surround-sound receivers combined with CD players, DVD players, high-end speakers, and even the occasional retro turntable. All these components "plug and play" with each other to provide the best possible sound experience. This architecture works because of the standards that have been established for decades and that enable different devices to work together. We will see below that BOB software components for an HRIS still need to mature somewhat to reach the capability of the analog audio components. Yet the goal remains the same: deliver the best possible point solution to meet the business need.

For this synergy to work properly, three conditions need to be present for each software solution:

- First, there should be a perceived need for a specialized solution. For example, if a company expects to receive electronic job applications over the Internet 90% or more of the time, an **optical character recognition (OCR)** program, which scans handwritten or typewritten forms into an electronic format, would not be needed for resume scanning.
- Second, a universally agreed-on set of guidelines for interoperability must exist between applications. This exists at both the **syntactical level** and the **semantic level.** The syntactical level refers to the base "alphabet" used to describe an interface. For any two applications to communicate, they will need to share data. This data exchange can be done through databases, simple text files (such as Excel), or, increasingly, **XML (eXtensible Markup Language).** Basically, XML is similar to HTML, which is used in all Internet browsers. XML files can be shared or transmitted between most software applications today. XML presents a structured syntax—an alphabet—to describe any data elements within an HRIS.
- Third, applications need to "speak the same language." Just as the

> Roman alphabet allows the spelling of words in multiple languages and formats, XML enables data to be described with many different tags. At the semantic level, the language needs to map between software applications. An employee's data description may consist of various tagged fields, such as Name, Address, Birth Date, Phone, Title, Location, and so on. If one of the applications does not have most of the same set of XML tags, it will not be able to exchange employee data. As important as the shared data semantics between applications is having analogous business process semantics. For example, a time-keeping system may define a pay period differently from the payroll application that actually prints employee checks.

An HR example would consist of selecting the most robust HR software applications—regardless of vendor—for each need and then using the XML language to move data efficiently among those applications. The HR department might select SilkRoad for talent management (recruiting), Workday for most HR applications and data management, Kronos software for time and labor tracking, ADP software for payroll purposes, and a proprietary vendor product for outsourced HR benefits administration. To integrate these applications and create a seamless interface for users, companies will often utilize **middleware** software that sits on top of the applications, and can give the different applications an overall look and feel and single point login. If the above conditions are met, HRIS applications should be able to interoperate with many point solutions. What are the typical solutions found in an HRIS implementation? The following sections will detail examples of solutions for some of the HR functions in an organization.

Talent Management

The business process to recruit new employees for a company has many BOB opportunities. Large HRIS applications tend to focus on the internal hiring processes of the company—creating and approving job requisitions, saving applicant data, scheduling interviews, capturing interview results, and, finally, hiring the new employee. Yet there exist other software applications to fine-tune the hiring process. OCR scanning applications can eliminate the rekeying of applicant data from paper-based resumes, and other applications can perform applicant database searches, post job requisitions directly to

Internet job sites, and run applicant background checks. These examples of specific functionality are typically not provided in an HRIS.

Time and Attendance

Most companies require employees to submit time-keeping data each pay period. For hourly employees, this typically means using a punch card and time clock to track hours. Some solutions use employee badges with magnetic stripes, thereby enabling employees to clock in and out. Again, most HRIS vendors do not provide the hardware needed to track time. Time-keeping systems will capture the hourly data from various readers throughout a site. Employee scheduling for various shift coverages can be implemented with time collection or planning software. For example, transit districts schedule bus operators to cover a very complex route system throughout the week. Unionized rules force certain break periods and preferences for senior operators. Driver schedules are posted for future pay periods, and actual hours worked, reported sick, taken as vacation time, and so on, are collected for prior pay periods. Such data will be reviewed each pay period prior to being transmitted to the HRIS payroll application.

Payroll

In some cases, the entire payroll process may be outsourced to another vendor, such as ADP. ADP specializes in providing payroll services for companies of all sizes. For some enterprises, the cost of maintaining a payroll application and staff in-house may outweigh the benefits of controlling the process. In this case, employee time data, pay rate, and benefit information would be transmitted to ADP for processing. This choice of using an outside provider is conceptually the reverse of the typical BOB motivation. The enterprise is not looking for the *best* technical or functional solution, but for a provider offering a commodity service at the *lowest* cost. In the case of a large multinational corporation with lots of employee levels, it would probably be prudent to purchase the HRIS payroll application.

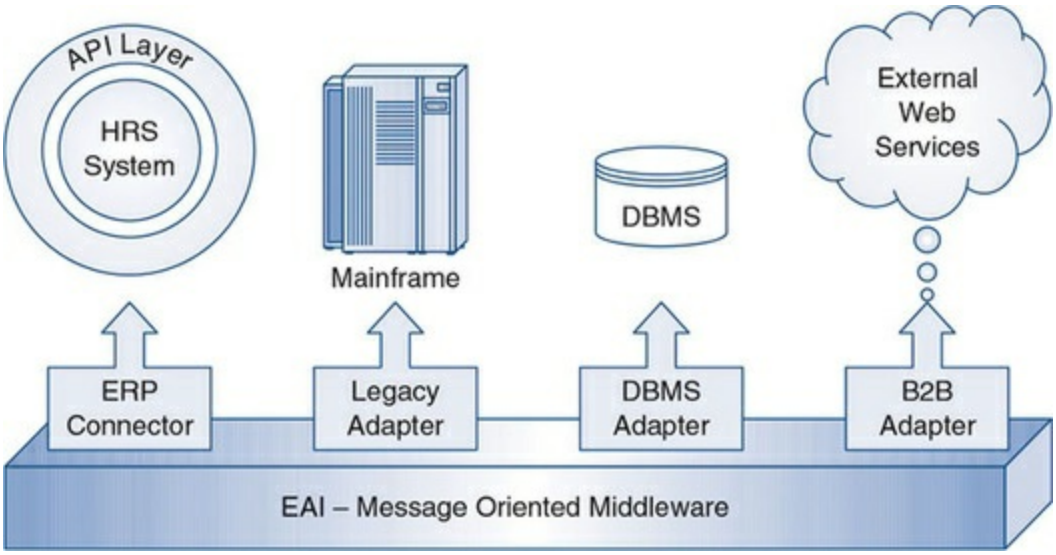
Benefits

Each year, most employers present their employees with what is called the benefits open enrollment period during which signing up for benefits is similar to course enrollment for students each semester. Instead of enrolling in courses, though, employees enroll for major medical, dental, and insurance benefits. For example, employees choose between health care providers such as Kaiser or Blue Cross for their medical insurance. These providers support interfaces with the major HRIS applications so that, as employees log into the enrollment software, they can review offerings tailored to their company's plan. Thus, when employees select a particular insurance program, they can then transmit enrollment data to the provider through their organization's HRIS.

As one can see in Figure 3.4, BOB solutions introduce additional complexity into the software architecture. This complexity can add IT expense in the form of new software licensing and programming charges. The justification for the added functionality needs to compensate for these additional costs. So a cost-benefit analysis should be performed by the HR function to determine whether the BOB alternative is to be used. Detailed procedures to compute a cost-benefit analysis are covered in Chapter 7.

In summary, BOB options can create a much more powerful solution than a stand-alone HRIS. The BOB alternative also creates system flexibility, as each application can be managed and upgraded independently. Yet this power and flexibility may end up costing the IT department by giving rise to more complex systems administration issues.

Figure 3.4 Best-of-Breed Solutions Architecture



Planning for System Implementation

A variety of authors, consultants, and others have discussed implementation methods for information systems. Rampton, Turnbull, and Doran (1999) discuss 13 steps in the implementation process. Jessup and Valacich (1999) divide the implementation of a system into five steps, with a focus on the systems side of the process. Regan and O'Conner (2002) provide eight steps for implementing information systems. Some organizations have proprietary processes that they use for all implementations. Points to remember in regard to system implementation as this section is examined are as follows: (1) This is a process that will take a team of individuals anywhere from six weeks to three years to complete; (2) a variety of ways to manage this process may be attempted, so long as the key issues are examined and organizational goals for the implementation are achieved; and (3) there is no single definitive approach to be used in all situations.

The first key step is planning. This is an absolutely critical step in any business process and especially in the design of any large-scale software implementation involving multiple-process interfaces. Note that the planning process doesn't guarantee success—rather, it increases the probability that the implementation will be successful. The systematic examination of the following topics provides the organization with the opportunity to see how the implementation will work—to peer into the crystal ball—and identify some contingencies for implementation steps that might not go perfectly. In

other words, a robust planning process provides a framework within which the implementation team can proceed, and it provides some decision-making parameters for any unforeseen difficulties that might appear (Bedell, 2003a).

The topics that need to be discussed during the various steps of the planning process include, but are not limited to, the following:

- **Project manager**
- Steering committee/project charter
- Implementation team
- **Project scope**
- Management sponsorship
- Process mapping
- Software implementation
- Customization (vanilla vs. custom)
- Change management
- "Go live"
- Project evaluation
- Potential pitfalls

Rather than go into a lengthy discussion of all of the topics above regarding systems development, Chapter 4 address them more in-depth, and Chapter 6 discusses issues surrounding change management processes in HRIS implementations.

Summary

The implementation of an HRIS goes beyond simply placing a new technology into the organization. The organization the challenges of coordinating different organizational, people, and technical needs. The first section considers the important internal and external users or customers of the HRIS and organizational goals. In the second section, four different types of HRIS architectures are enumerated. The evolution of technology, from legacy "dinosaur" systems to contemporary N-tier architectures as well as cloud and mobile computing, has dramatically affected the scope and influence of HRIS in organizations. Therefore, the strengths and weaknesses of each architecture are discussed. The third section of the chapter discusses the best-of-breed approach to HRIS adoption and the pros and cons of this approach in

different functional areas. Finally, the chapter concludes with a general discussion of the steps that organizations might take to plan and implement an HRIS and of the factors that can affect these processes. In summary, organizations that are able to manage the people, processes, and technology involved in an HRIS implementation should be more likely to find that the new HRIS is able to meet their goals more effectively in terms of budget, functionality, and usability than those who are unable to do so.

Key Terms

bandwidth 54
best of breed (BOB) 58
cloud computing 56
enterprise resource planning (ERP) software 46
eXtensible Markup Language (XML) 58
Hyper Text Markup Language (HTML) 54
implementation team 48
infrastructure as a service 56
load balancing 54
middleware 59
operating systems (OS) 54
optical character recognition (OCR) 58
platform as a service 56
project manager 62
project scope 62
semantic level 58
software as a service (SaaS) 56
sourcing partner organizations 51
syntactical level 58
three-tier architecture 53
two-tier (client-server) architecture 53

Discussion Questions

1. Identify the various types of users or customers of an HRIS.
2. What are the three broad categories of data that an HRIS manages?
3. How does network bandwidth affect a two-tier (client-server)

architecture?

4. How does an N-tier architecture simplify the IT department's task of maintaining client software?
5. Research www.hropenstandards.org. How many transactions or interfaces do the standards support? How many software vendors are involved with the organization?
6. Take a specific industry, say the K–12 education industry. How might HireRight's integration with Oracle's PeopleSoft assist the process of hiring employees such as bus drivers, janitors, or campus security?
7. When might BOB not be best?
8. The systems development process has been discussed by many. Name five discussion topics that need to be completed during the planning process.
9. How does network bandwidth impact a two-tier (client-server) architecture?
10. How does an N-tier simplify IT departments' task of maintaining client software?
11. How does the use of smartphones and other devices make delivery of HRIS functionality more effective? More complicated?

Case Study: Vignette Revisited

This case is revisited with some additional information that involves the understanding of the material in this chapter. The additional information will be added to the situation described in the vignette at the beginning of this chapter.

A billion-dollar retailer with more than 4,000 stores finds that it cannot move fast enough to beat the competition. The organization's senior management arrives at the conclusion that it would be easier to achieve the strategic goals enumerated by the board of directors if the various organizational functions would share information. Shared information would enable them to develop and deploy new actions and tactics more quickly. The CEO and the president have therefore ordered the major functions to immediately update their information systems so that data sharing is possible. The SVPs of accounting and human resources immediately decide that the only solution is to decide jointly on an ERP product. ERP software applications are a set of integrated

database applications, or modules, that carry out the most common business functions, including human resources, general ledger, accounts payable, accounts receivable, order management, inventory control, and customer relationship management. To speed the installation along, they will install it using a rapid implementation methodology that a company down the street used. The goal is to have the new systems operational in nine months.

Shortly after this decision is made, the SVP of HR calls you into his office and tells you that you will be management sponsor for this project. You have to decide on everything. You sit back in your nice office and think:

> What's the problem with this scenario? It shouldn't be difficult to select a vendor and then borrow the methodology from down the street. It worked for them; it should work for us! We'll call a few vendors in the morning and find out about cost, time frame, and implementation methods. In the meantime, I should find out a little more about how to do this and who will be using it. I remember from my information systems class in college that this is a reasonable first step when it comes to buying software.

What do you think your response would be to this inquiry? Has your response changed now that you have read this chapter? If so, how?

New Information for the Case: Part 1

After some discussions with department heads from all the departments in the organization, you realize that there are a large number of people (stakeholders) who will be affected by the new systems. Furthermore, you come to realize how important HR data really are to these stakeholders. Based on this information, you think, “Wow, there are far more people who could be potentially using this information system than I expected!” The old textbook and the vendor information should provide a lot to think about.

Using the information from the section of this chapter titled “HRIS Customers/Users: Data Importance,” please answer the following questions:

1. Identify some of the customers who would be logical members of the implementation team and explain why.
2. Think through an HR process and sketch out what data are necessary to complete your sample process well. How much history does the organization need to convert to continue functioning?
3. Pick one area of the HR function (e.g., recruiting), and make a list of processes that will need to be mapped and possibly reengineered during this implementation.

New Information for the Case: Part 2

Over the next month, as you continue to obtain information about the design and implementation of the new system, you are still somewhat confused about what to do. Once again, we find you in your office thinking:

> There are so many potential decisions to make with regard to hardware! I wonder what we need to schedule, if we need to buy hardware, and how we should configure the servers to ensure maximum security. And this bring-your-own-device stuff is going to drive us nuts! It's time to make another list of questions!

Based on the information in the section of the chapter titled "HRIS Architecture," please respond to the following:

1. Make a list of questions for each of the following individuals: lead hardware technical expert, network manager, and chief software manager.
2. What configuration should the company use? Make a suggestion and support it!
3. Make some recommendations about security and bring-your-own-device.

New Information for the Case: Part 3

As part of your investigation, you have uncovered a system concept called “best of breed.” You are in your office again trying to decide what to do, and you think, “Perhaps best of breed might be the easiest and best way to go.”

1. Make a recommendation as to whether a BOB option should be chosen or a more standardized option with simpler interfaces between hardware and software should be selected.
2. Think about what the best answer should be when you have to connect your system with accounting and finance. Make a recommendation and support it!

New Information for the Case: Part 4

You have just sat down in your office feeling as if there is way too much to do! Your IS software professional has given you the information from one of the potential vendors about the various steps that need to be taken in implementation of the HRIS. Your immediate reaction is, “Man, am I going to be at work late for the next many months!”

Case Study Questions

Based on the information in this chapter, answer the following questions:

1. Develop the first few steps of the project plan.
2. Discuss the potential political necessities outlined in this section as they relate to this type of implementation.
3. Think about and create a list of steps that make sense for your organization.
4. Is the nine-month rapid-implementation time frame feasible? Or will it just lead to failure?

Industry Brief: Jim Pascarell, Vice President, Nfrastructure

Designing and implementing an HRIS is one of those initiatives that every organization encounters, yet most of the individuals within an organization usually have little or no experience in going through the process. This combined with the continuous evolution of technology puts organizations in the precarious spot of trying to figure out the best approach to successfully choosing and implementing a solution that provides the organization with all of the necessary value-added benefits, yet manages the risk of a potential failed implementation.

Organizations, whether they are commercial, education, or public sector, that have had the most success follow a design methodology that is centered on people, process, and technology. Those of us that have spent a great deal of our careers designing and implementing these systems have learned, sometimes through trial and error, that the planning and design of the system

arguably plays the most critical part in determining success. Common characteristics shared by organizations that have been and are most successful are as follows:

Commitment: A frequently used word that is only proven to be true by actions. Defining and understanding what the system needs to provide so that it can be an enabler for the organization and used as a competitive differentiator.

Proper Resource Allocation: Having your best and brightest be part of the design, participating throughout the lifecycle of an implementation. Insight is critical and to avoid sloppy design, it is worth the sacrifice to dedicate some of the most knowledgeable resources in the organization. The cost of not doing this will be paid later on due to rework and changes.

Understanding of Technology: Designing a system that will evolve along with technology, not one that will be restricted as technology changes. There are too many organization design systems that are somewhat outdated in a short period of time. This is primarily caused by the lack of understanding as to what the capabilities of the technology are and how they can help the system continue to be enhanced. I unfortunately have been part of many projects where once a system was "live" and operational, it almost immediately needed to be "upgraded" due to improper design upfront.

Clear and Realistic Expectations: Once set, these expectations need to be constantly communicated to all stakeholders. This provides a common bond and keeps everyone focused on what needs to be accomplished.

Acceptance of Change: Through education and training, acceptance defeats resistance. Too many organizations choose the right technology yet fail to allocate the proper attention to change management.

Over 25 years of working and assisting with many diverse organizations as they design their HRIS, the most successful have truly understood and successfully managed the points above. Through dedication and perseverance, these organizations have become leaders in their industries by using all of the benefits a properly designed HRIS can provide. As we continue into the digital age with access to more data faster than we could

have ever imagined, it has never been more important for organizations to "get it right" when it comes to designing their HRIS.

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Part II Managing HRIS Implementations

4 The Systems Development Life Cycle and HRIS Needs Analysis

Lisa M. Plantamura

Richard D. Johnson

Editors' Note

This chapter begins the section of the book focused on managing HRIS implementation—how to determine the needs for an HRIS and how that determination affects the design of the HRIS. The idea that there will be different users of the HRIS with various data and information needs was introduced briefly in Chapter 3. In this chapter, you will see the importance of the initial needs analysis and learn how it is done. In keeping with the holistic nature of HRIS, the systems development life cycle (SDLC) is introduced; however, this chapter focuses heavily on the analysis phase of the SDLC, as the remaining parts, namely, planning, design, implementation, and maintenance, are discussed in subsequent chapters. The authors emphasize that the needs analysis begins the process of HRIS design, but that this analysis is also done continuously throughout the system design process. This notion of continuously updating the needs analysis recognizes the possibility of both organizational and technology changes during the development and implementation of the HRIS. In addition, it is important to complete an accurate and comprehensive needs analysis because this will provide the blueprint for the evaluation of the HRIS after it is implemented.

Chapter Objectives

The learning goals for this chapter are listed below. After completing this chapter, you should be able to

- Define the systems development life cycle (SDLC)
- Explain how the analysis phase of the SDLC informs the needs analysis process
- Describe the purpose of needs analysis and why it is important
- Outline the main stages of needs analysis
- Identify what is involved in an HRIS needs analysis, including the types of activities performed
- List the typical participants involved in an HRIS needs analysis
- State the key deliverables of an HRIS needs analysis

HRIS In Action

Failing to Plan Is Planning to Fail

A multimedia company planned to offer a special benefits package to a select group of employees. The purpose of the package was to encourage some employees to retire early, which would provide cost savings to the company, as well as meet some of its other needs, such as providing promotional opportunities to help attract and retain younger employees. The special package included granting additional years of service for the purposes of calculating retirement and retiree medical benefits, granting additional age to employees to be used in the calculation of eligibility for early retirement incentives from the pension plan, and eliminating some portion of the normal reductions in pension plan benefits for those taking early retirement. The cost of implementing these changes in the existing system for the estimated eligible group of just over 500 employees was prohibitive due to the complex nature of the calculations involved.

The project was in danger of being canceled until a careful needs analysis was done. For 500 employees, did the solution need to be fully automated?

Did employees need to be able to model their retirement benefits on the Internet? How much manual work could be relied on to handle the workload? Did the project need to be repeatable?

The answer for the multimedia company was to build a simple solution outside its HRIS using spreadsheet and word merge applications and to couple that simple solution with a high-touch customer service group that was able to respond to the needs of program participants, manage the increased manual paperwork requirements, and perform the interventions into the system to make the components that had to be automated, such as the payment of benefits, function properly. The program that had nearly been canceled was a success, so much so that it was repeated just the next year in another company division.

Implementing the changes in the existing HRIS would have been the obvious solution, but creating a one-time solution when it appeared there would be little future need for a complicated implementation was the right choice in this case. Careful, honest, and practical needs analysis made possible what had been impractical due to cost concerns. It should be noted, however, that the HRIS provider recognized the need the multimedia company had expressed and later made a decision to augment its software to include features that would provide greater flexibility for future offerings, meeting a need the provider had not recognized during its own original planning and needs analysis.

Introduction

> *For either you know what you are looking for and then there is no problem, or you don't know and then you cannot expect to find anything.*
>
> —Plato

This chapter briefly introduces the systems development life cycle and provides readers with an in-depth look at one of its most important phases: analysis. The SDLC focuses on the activities across all aspects of the

development project. The second part of the chapter focuses on one specific activity within the analysis phase of the SDLC: needs analysis. **Needs analysis** refers to the process of gathering, prioritizing, and documenting an organization's human resources (HR) information requirements thoroughly, and it serves as a necessary input for the subsequent design and implementation of a human resource information system (HRIS).

Needs analysis usually takes on a particularly prominent role in the analysis phase of an HRIS development project, prior to significant design and implementation activities. It is important to note, however, that the needs analysis for the HRIS continues through the entire systems development process because each stage in the process could lead to the identification of new needs for the HRIS. An effective needs analysis can help the organization save costs and reduce headaches in later phases of the development and implementation process. Consider, for example, some of the potential costs of not planning and conducting a thorough needs analysis:

- Users reject an HRIS that fails to provide the functionality they need.
- Vendor software packages are selected based on incomplete, inaccurate, or irrelevant criteria.
- Costly custom systems are developed and built based on arbitrary data.
- Custom additions to the HRIS are required to fill needs after implementation, as these needs were not properly identified during the needs analysis.
- Scope creep occurs because of growth in the goals, functionality, and requirements of the HRIS without adjustments to the time, cost, or resources allocated to the project.

Consequently, needs analysis is not something that HRIS project personnel *choose* to do; it is something they *must* do. The following sections in this chapter provide a road map for conducting a needs analysis. First, we discuss the systems development life cycle.

The Systems Development Life Cycle

The **systems development life cycle (SDLC)** is a formal, multistage process through which information systems are implemented. Specific phases include

planning, analysis, design, implementation, and maintenance (Figure 4.1). Just as each organization has a unique culture, so, too, the SDLC is often tailored to the needs of each organization. Some organizations may choose to codify over 20 phases in their life cycle, while others may use only the five phases listed above. Despite the variation in the number of phases, most scholars and practitioners would agree that the activities outlined in the five-phase SDLC introduced here contain the major system development activities.

This phased approach to system design has multiple advantages. First, it allows the organization to focus on a limited set of issues. Second, it contains many activities within one phase and allows organizations to make "go, no-go" decisions at the end of each phase. If at any time the project is seen as not meeting organizational objectives, it can be terminated, with the work to-date providing a baseline for future development (if future conditions merit moving forward).

We encourage readers to take particular note of the dashed lines in Figure 4.1, as they represent the idea that you may find it necessary to revisit previous phases of the life cycle if conditions change or if details were missed. The problem is that, just like climbing a real waterfall, moving back up the life cycle can be costly, challenging, and require significant effort. Just ask salmon how hard it is to swim upstream! Each of the five phases in the SDLC is important, and skipping any specific phase can have negative impact on the success of your project. Let us consider more closely the SDLC phases depicted in Figure 4.1:

1. *Planning:* The **planning phase** of the SDLC includes both long-range or strategic planning and short-range operational planning. During the planning phase, HR will determine the existing technological and system capabilities and develop a general plan for adapting, upgrading, or changing these plans. In a sense, HR is conducting an analysis of their future human capital strategies and assessing what may need to be done technologically to ensure that these strategies may occur. As this phase is at a strategic level, the planning is very high level and not detailed. At the end of this phase, an organization should have a general idea of the issues it needs to address and may have developed a plan to move

forward. It is important to note that, in addition to poor planning, inadequate change management is a significant reason why HRIS projects may fail. Change management processes should begin during the planning phase to prepare employees for the transformation process that is coming. The role of change management is covered in more detail in Chapter 6.

2. *Analysis:* It is in the **analysis phase** that an organization's current capabilities are documented, new needs are identified, and the scope of an HRIS is determined. For many projects, this phase can be the most time-consuming and important phase of the SDLC. The analysis phase of the SDLC encompasses steps such as reviewing the current system processes, looking for opportunities for improvement, exploring and justifying change, developing requirements for the new system (needs analysis), and prioritizing those needs. At the end of this phase, a formal requirements definition report should be completed and available for use in systems design or vendor evaluation. Because needs analysis is such an integral part of the analysis phase, we devote an entire section of the chapter to it below.
3. *Design:* In the **design phase**, the blueprint for the new system and detailed specifications are developed and finalized. The final vendor evaluation and selection often occurs during the design phase. (This topic is covered in detail in the next chapter.) Using the results of the needs analysis conducted in the previous SDLC phase, the current human resources processes may be changed and updated to reflect current organizational needs and potentially industry best practices. Organizations have many options in design, and these options are also covered more extensively in the next chapter.
4. *Implementation:* During the **implementation phase**, the HRIS is built, tested, and readied for the actual rollout, or "go live" stage—the point in the SDLC at which the old system is turned off and the new system is put into operation. Two common approaches to switching from the old system to the new system, used by many organizations, are to either pilot the new HRIS in one location before fully going live or to turn on limited functions and then continue to add functionality. There is not one single optimal approach, but instead, the approach used by your organization should reflect your needs and context. Key steps in implementation include coding or configuring modules, system testing,

finalizing procedures, converting old data for use in the new system, documentation, and training end users.

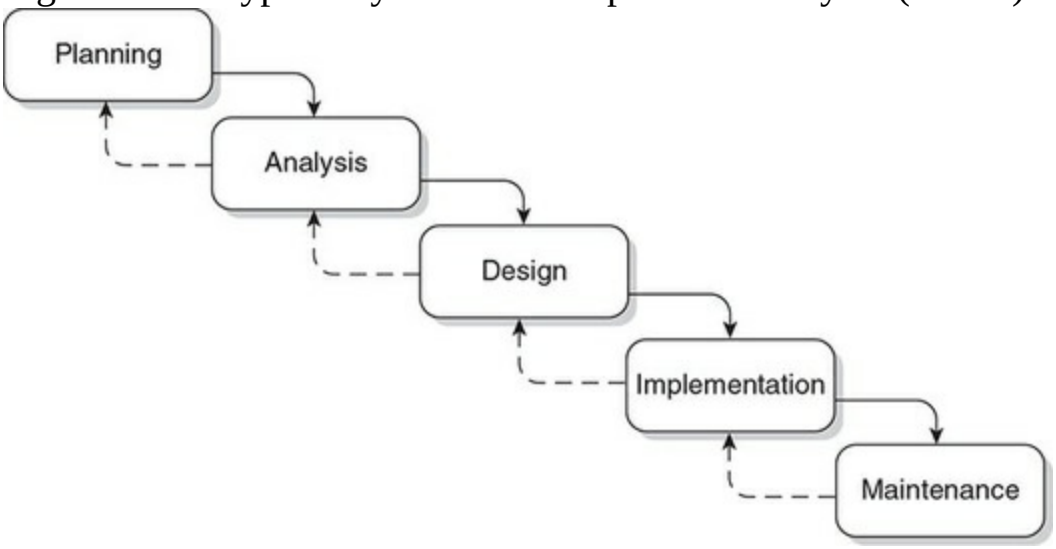
5. *Maintenance:* The SDLC does not end once the go-live date arrives. The **maintenance phase**, sometimes referred to as the "forgotten phase" (Smith, 2001), is the phase in the life of an HRIS during which the primary objective is to prolong its useful life. Maintenance begins immediately when the new system goes live. Consequently, a crucial part of maintenance is the evaluation of the HRIS. Does the HRIS meet the needs of all users as determined earlier in the SDLC? Has the system been accepted by the users? Is the HRIS being used properly? Maintenance serves four main purposes:
    1. **Corrective Maintenance**—There will be times that despite the best efforts of designers and implementers, something in the system doesn't work properly and must be fixed (e.g., computer bugs, misinterpreted designs, incorrectly specified designs, or identified needs ignored).
    2. **Adaptive Maintenance**—The human resources environment is always changing and evolving. For example, new government regulations affecting HR practices, such as legislation addressing racial and gender discrimination, can prompt new requirements or alter the old requirements of the system.
    3. **Perfective Maintenance**—The goal of perfective maintenance is to tweak or improve on the existing system. For example, a more efficient routine that speeds up processing times could be developed in the maintenance phase.
    4. **Preventative Maintenance**—Preventative maintenance focuses on the ongoing requirements of maintaining the hardware and software than runs the HRIS. Such a maintenance action will prevent future system crashes due to inadequate hardware.

Having briefly reviewed the SDLC, the remainder of the chapter will focus on needs analysis. Although needs analysis is important throughout the life of a project, it is particularly important early in the project—in the planning and analysis phases.

Analysis

As noted above, the analysis phase of the SDLC encompasses multiple steps, including conducting a needs analysis and writing a formal requirements definition report. Organizations sometimes skip over analysis, progressing directly to solutions, as people may be influenced by the marketing materials and promises made by software vendors. It is not unheard of for HR representatives, after attending trade shows and viewing potential HRIS solutions, to make a purchasing decision based on what they have seen, rather than what their organization really needs.

Figure 4.1 A Typical Systems Development Life Cycle (SDLC)



This phase is particularly important because, unless the requirements are specified in detail, the organization cannot select the best vendor package or design their own system effectively. Regardless of whether it is built or bought, HRIS software is expensive, so the investment made should be in the best system that fits the organization's needs. When an organization does not conduct a proper needs analysis, it may expend considerable effort reworking the solution because it does not meet their needs. In fact, it has been argued that the costs to fix errors increase exponentially through the life cycle. What this means is that a $100 fix during analysis could be a $10,000 fix during the implementation. Additionally, time is wasted, as it takes longer to get to a solution that works for the organization. A proper needs analysis provides the organization with information focused on the essential areas of HR and organizational functioning to be supported by the HRIS. This information is then used to document the functional system requirements. Do not underestimate the importance of analysis. Remember, it is easier (and less

expensive!) to fix a problem now before the new system is designed, rather than when it has been implemented.

Needs Analysis

As noted above, needs analysis focuses on the process of thoroughly gathering, prioritizing, and documenting an organization's HR information requirements. The first question that you may want to ask is why would you undertake a needs analysis? Essentially, the purpose of needs analysis is to collect and document information related to making changes connected to

- current system performance issues;
- the introduction of a new system, application, task, or technology; or
- any opportunities perceived to benefit the organization.

The process of conducting a needs analysis is systematic, and it should progress in a logical, methodical fashion, as each stage affects those that follow. An effective needs analysis consists of five main stages, each of which has activities that will be discussed in detail:

1. Needs Analysis Planning
2. Observation
3. Exploration
4. Evaluation
5. Reporting

Regardless of the type of system desired, all stages should be completed, although more detail may be required when, for example, a system is being built in-house rather than purchased from a vendor.[1] The resulting HRIS will be better formulated, executed, accepted by employees, and used if time and effort are invested in this early phase. At the end of needs analysis, there will a detailed and prioritized list and description of HR's current and future functional automation support needs.

[1] Although most organizations no longer build full systems from scratch, many organizations find it necessary to customize their systems by building their own modules or apps. Thus, the same need and logic would apply to

these small-scale changes.

1. Needs Analysis Planning

During this first stage of the needs analysis process, **needs analysis planning**, the team is assembled and prepares to investigate the current and desired system applications and functions. Once the team is in place, they can begin arranging and conducting a thorough investigation. There are four major activities that need to be completed during this stage. Each is discussed in turn.

Organize the Needs Analysis Team

The needs analysis is generally conducted by a team led by HRIS analysts and involving human resources and information technology staff. The team must work with current systems users and associated constituents and **stakeholders** to identify problems clearly, research possible ways of addressing the problems, and report their findings to support a decision on the most appropriate solutions. There are several key organizational personnel who need to be part of this team. For example, a senior-level manager, preferably with HRIS analysis experience, should be on the team and have overall accountability for needs analysis. In addition, an information technology professional should be included, along with at least one employee who has knowledge of the present HRIS (if there is one) or current HR processes. Finally, for large-scale projects, teams may wish to involve an external consultant. If an outside consultant will be involved in the needs analysis, it is important that he or she be integrated early in the assignment.

In addition to this core project team, a task force of constituents from the functional areas is needed to speak for the stakeholders. This group should include representatives from each area of HR, payroll, and any other areas that may use the HRIS directly (e.g., managers who make personnel decisions). Table 4.1 provides a list of several common stakeholders in many large organizations. These people will participate in review and verification of findings, as well as serve as liaisons for their departments or functions. They should support the core team and care about the project.

TABLE 4.1 ■ Common Organizational Stakeholders

Human Resources Stakeholders	Other Stakeholders
Benefits Administration	Payroll
Compensation	Corporate Security
Diversity Management	Auditing
EEO/Affirmative Action	Organizational Subsidiaries
Employment	Service Bureaus and Third-Party Processors
Employee Relations	Retirees
Ethics and Sustainability	General Ledger
Global HR	Telephone Directories
Health and Safety	Medical
HR Consulting	Legal
Incentive Programs	Company Store
Labor Relations	Community Relations
Pension Administration	Relocation Services
Profit Sharing	Emergency Services
Relocation	Corporate Strategy
Staffing Management	Mail Room
Succession Planning	
HR Technology	
Training and Employee Development	
Workers' Compensation	

Determine Management's Role

Next, it is important to determine upper management's role in the needs analysis. If top management support has not already been obtained, getting their active involvement and buy-in of other stakeholders can be difficult. Senior management sponsorship and a visible presence are critical to the success of the project, and mutual respect and honesty will allow the team to acquire the information needed to perform the analysis and make suitable recommendations. This group acts as a steering committee that will guide the

team, resolve issues, and set priorities.

Define the Goals

Once the needs analysis team is in place, the next step in planning is to define, clarify, and gain management acceptance on the goals for needs analysis. Goals give focus and provide a standard against which performance and achievement may be measured. Goals help the needs analysis team focus on what it hopes to achieve, how it plans to work, and the anticipated schedule, as well as how the completed needs analysis document will look. In addition to overall systems scope and processes, these goals may also include timing, budget, staffing, and any other factors that could affect system selection, development, implementation, and operations. Like other goals, they should be specific, measurable, attainable, relevant, and timely (SMART). At this point, the requirements should be phrased in terms of what the system should accomplish rather than how it will work; details will be determined later.

Determine Tools and Techniques to Be Used

Specific information-gathering tools and techniques should be used when conducting a needs analysis. Each organization and project will require its own combination of observation, exploration, analysis, and reporting approaches. The tools may run the gamut from simple paper-and-pen note taking for smaller projects through complex documentation systems for corporate-wide systems. Whatever the size of the project, it is important to choose tools that are easy to manage and allow the organization to gather the data needed to ensure that the organization can move into the design mode with accurate and timely data.

It is important to note that, although these tools and techniques assist analysts in examining every indicator, it is also important that the team verify all data and consider each alternative objectively before making any conclusions. In addition to identifying the tools and techniques to be used, it is also important to establish performance standards and criteria to measure the results of the process. This way, stakeholders can be satisfied that the recommendations are

based on thorough, rigorous research. We will discuss some of these tools and approaches later in the chapter.

2. Observation

During the **observation** stage, the needs analysis team observes the current systems and processes, forming the basis for later recommendations. At this point, the investigation is at a high level; more detailed data will be gathered later, during the exploration stage. During observation, it is important for the analysts to interact with employees at all levels in the areas that may be affected by the changes. Trends may become apparent, which could be helpful later. Involving employees now provides a great opportunity for them to voice their concerns and for the needs analysis team to better understand the strengths and weaknesses of the current systems and operations. Research has shown that the more involved the users are in the analysis, design, and implementation of new systems, the more successful these systems will be. Involving the users can create a sense of ownership, can lead to better communication and idea sharing, and has been shown to relate to more successful systems (cf. Harris & Weistroffer, 2009). The observation stage also consists of multiple steps, each of which is discussed below.

Analyze the Current Situation

This activity begins by assessing the current state of HR systems and processes. Before embarking on the detailed exploration of any new system, analysts must first develop a picture of present HR operations, including any problems and issues in each area or function. As part of this activity, analysts must consider the existing processes and current organizational results and compare these to the organization's expectations for what they anticipate in the future. Once a clear, objective understanding of current processes are obtained, this phase continues with a definition of needs. As an example, a tool such as the one shown in Figure 4.2 might be helpful during this stage to help organize the analysis.

Define the Needs

The next step in the observation stage is to define the needs that the new system must meet. The objective of this activity is to determine how those within HR believe their operations should occur, to evaluate industry best practices, and to begin investigating what changes or updates to the system may be valuable to adopt. As part of this step, organizational policies, procedures, and standards must be considered, along with any regulatory requirements. Essentially, the goal of this activity is to determine what the new system should accomplish.

Identify Performance Gaps

Once the team understands the current operating environment and has gained a strong understanding of the "ideal" operating environment, they can conduct a gap analysis. Comparing the current situation to the desired situation allows the organization to identify and outline any **performance gaps**. These gaps, or areas of mismatch between the existing and required processes, form the basis for developing the systems requirements that are documented during the analysis and reporting stages.

Classify the Data

Once the data have been gathered, they need to be organized. It is important to separate the data into categories by function, process, and other groupings that makes sense for your environment. In addition, technical and process systems issues should be separated from other organizational issues. For example, if there are problems with a specific function due to lack of knowledge on how the current process works, this may reflect a training issue rather than a system issue. In addition, the needs analysis team should separate the real problems from symptoms when reviewing the effects of one process on another. For example, late filings of mandated reports may be considered a problem, but it may actually be a symptom of the real issue, which might be lack of data needed to generate the report. Finally, consider the scope of the issue; does it affect a few employees or the entire management staff?

Figure 4.2 Example Preliminary Systems Review Document

Functional Area	Task	Current Process	Desired Process	Performance Issues
Compensation	Performance Reviews			
	Annual Salary Increases			
	Job Analysis			
	Salary Evaluation			
Benefits	Annual Benefits Enrollment			
	Claims Administration			
	Paid Time Off			
Employment	Employment Planning			
	Recruitment			
	Staffing			
Training and Development	Workforce Training			
	Career Development			
	Succession Planning			
	Performance Management			

Determine the Priorities

Using the information above, the team can now set the priorities for the needs that have been identified. The needs may be ranked based on scope, cost-benefit analysis, time to implement, and/or potential impact if ignored. Management will be interested in these assessments when reviewing the results of the preliminary analysis. Before presenting the results to management, it is a good idea to have the task force review priorities to ensure that the assessment is accurate.

Note that both *needs* and *requirements* are strong words in the sense that they imply something that the organization, and therefore the HRIS, *must have.* It

is important to recognize that as needs are being identified, a process should be put into place to prioritize them. This ranking will result in a list of needs that fall along a continuum from high-priority or critical needs (e.g., those that definitely will be built into the system); to medium-priority needs, which are likely to be included; to low-priority needs, which may be incorporated if time and resources allow. More on this is discussed in the following sections.

Review With Management

When presenting the preliminary findings to management, the analysis team should be prepared to adjust priorities as requested, clarify any remaining questions, and discuss the next phase of the project in order to gain management's continued commitment. It is important to work with management to define the scope, agree on the process, state the desired outcome(s), and establish shared responsibility for the continuation of the project. The team should also ensure that management understands that the full needs analysis takes time to design, develop, and accomplish. How long this will take depends on the complexity of the organization and the number of people working on the analysis. It is critical *not* to promise more than can be delivered. One of the challenges is that the analysis phase is time-consuming and complex, yet HR and management will likely push the team to finish the phase as quickly as possible. Therefore, the analysis team should be prepared to defend the phase and educate stakeholders on what the phase entails and why it should be completed before moving forward. Ultimately, though, management's commitment is essential to fund, staff, and back the next stage. Thus, it is important to receive formal management support and agreement (e.g., memo, contract, etc.) before moving forward.

3. Exploration

The **exploration** stage of the needs analysis process builds on the analysis completed in the observation stage and involves gathering additional and more detailed data regarding HR processes. Remember that the problems must be defined clearly before any suitable solutions may be determined.

Collect the Data

The data collected during exploration provide the foundation for the development of goals that the organization wishes to achieve with the new system. These data also help the organization align their new system with key HR objectives. It is important to keep in mind that the data collected during the needs analysis may be used for other purposes after the system is developed and implemented, so it pays to do a good job now. In other words, good documentation now means fewer problems later! Multiple techniques should be used to collect data for the needs analysis, including interviews, questionnaires, observation, focus groups, and reviews of job descriptions, policies, procedures, and other documentation.

Interviews

The goal of conducting **interviews** is to find representative employees who can effectively communicate the key HR practices and processes to the analysis team so that the team can develop a thorough understanding of current HR operations. A variety of different interview types may be used when conducting a needs analysis. They can run the gamut from completely unstructured interviews, where a general topic is introduced for discussion and the interviewer lets the interview progress naturally, to highly structured interviews, where the interviewer asks specific questions in a predetermined order and respondents select from a set of alternative answers. An example of a structured interview script/guide is shown in Figure 4.3.

Figure 4.3 Interview Guide

Interviewee:	
Date:	
Position:	
Function:	
Phone:	
E-mail:	
System/Activity:	
Staffing (FT, PT, Temps, etc.):	
Brief Description:	
Technology/Software in Use:	
Status:	
Which data are collected, stored, and/or used by this function?	
Which of these data are automated, and in which systems?	
Which additional data could be automated, and in which systems?	
What problems do you experience with your current systems?	
How often have you observed this problem, or how often does it occur?	
Interviewer:	

The results of interviews can then be compiled by functional area experts and reviewed by that area's management to make certain that all tasks are covered and represented correctly. Although interviews are time and labor intensive, when conducted well, they can contain the required data needed to assess the system requirements as well as being a rich source of opinions, ideas, and suggestions. It is also important that the interviewer reviews his or her notes soon after completing the interview to ensure that the information recorded is complete and accurate. The longer you go without writing down and reviewing your notes, the harder it will be to ensure that your notes are accurate.

Questionnaires

Questionnaires are structured data-collection tools that must be designed and implemented carefully in order to obtain usable results. Before the questionnaire is implemented, the purpose and importance of each question should be determined. Employee time is valuable, and no question should be

included unless it serves a clear purpose that helps the analysts better understand HR data or processes. In addition, from a statistical standpoint, it is important that the questions are reliable and valid so that any analysis of the captured data can be trusted. As you would expect, it is important to design a professional-looking document (or Web survey, if administering the questionnaire online), to use clear instructions, and to focus on developing a document that is easy to use. Before launching the questionnaire to employees, the questionnaire should be tested to ensure that the questions are clear and understandable, and that they are collecting the needed data. Finally, throughout the process, it is important not only to ensure that respondents' answers remain confidential, but also that the respondents understand that their answers will remain confidential.

As with interviews, questionnaires also have several advantages and disadvantages. For example, one advantage of questionnaires is they can be distributed to large groups quickly and easily. In addition, questionnaires are much less time-consuming than observing or interviewing employees. Questionnaires also lend themselves to easier analysis and can be more convenient for employees (i.e., they can be completed at a time of their choosing). Finally, because questionnaires can be viewed as more anonymous, it increases the likelihood that you may obtain more accurate and honest responses.

Questionnaires do have shortcomings, though. Compared to interviews, questionnaires have much lower response rates. Many employees may not perceive that they have the time to complete them, or they may feel that their responses do not matter. Unlike an interview, questionnaires contain less rich data because there are no opportunities for an interviewer to focus on any nonverbal cues or to engage in follow-up questions as needed. In addition, questionnaires can be used less effectively to increase employee or management buy-in. People like to have their opinions valued, and interviews can reinforce their feelings of worth. When employees believe that their feelings and perceptions are valued and they are involved in the decision processes, they feel greater ownership in the new system (Wu & Marakas, 2006).

Observation

Another excellent way to gather data regarding HR processes is to observe personnel as they do their jobs. Because observation takes place in the actual work environment, information is obtained within the context in which HR activities occur. Observation is most useful when trying to determine what employees do and in what order. Further, it can be used to identify potential causes of performance issues. Although observation has the advantage of minimizing interruption of routine functions, observers must be skilled in observation and knowledgeable of the process itself.

Prior to observing employees in the work setting, it is important to determine the activity to be studied and to collect and review any documentation available (e.g., mission statements, organization charts, position descriptions, current systems processes, policies, etc.). In addition, try to remain as unobtrusive as possible, take notes for later clarification, and refrain from disturbing the employees' work.

Observation has its limitations, though. First, it is important to account for the fact that even with a well-trained and effective observer who attempts to remain unobtrusive, his or her presence alone may subtly affect how the employees go about their work. Second, observation is not as effective for high-level jobs where the process and outcome of work are not as easily seen. For example, complex tasks that require an employee or manager to make decisions are not easily observed and may require interviewing the employee to better understand the actual decision-making process. Therefore, observation may be best for simpler tasks, tasks in which data are not as accurately articulated by employees, or tasks where it may be easy to inadvertently miss key processes using other data-collection techniques.

Focus Groups

Focus groups consist of a small sample of people representing a larger population who gather together to discuss a topic; in this case, the topic would relate to the HRIS. Participants are asked for their opinions and attitudes, and the results can help to shape system requirements. Focus groups are important because they can provide the same depth of information as interviews, but they have the added advantage of bringing people together, which can lead to greater and more effective information sharing than if only

individual interviews were utilized. Although it can seem challenging to pull together the perfect combination of people at the same time, small discussion groups such as these may uncover needs not previously found and help the analysts identify new requirements. Recommendations for effective focus groups include the following:

- Limit the size of the group to no more than 8 to 12 people.
- Allow sufficient time to cover the material, generally one to two hours, and keep the meeting focused to make good use of everyone's time. Consider having a moderator assist in this process.
- Before starting the focus group, explain the objectives clearly.
- Encourage group members to speak freely and ensure that everyone participates. An icebreaker exercise can be a great way of opening up group communication.
- Use a variety of group facilitation methods, such as brainstorming, prioritizing, and consensus building to encourage and promote discussion on differences of opinion and to clarify issues.
- Take notes and/or video or audio tape the session, so that nothing is lost.
- Thank participants for their time and ideas.

Regardless of the methods chosen, it is critical to develop a concise problem statement that documents the causes of the issues to be resolved and separate facts from opinions. A **problem statement** is a well-defined, succinct description of the known symptoms and issues with current operations, their most likely causes, and how the proposed system will address these problems. The more precise and measurable a problem statement is, the more it will help to focus the team throughout the project and ultimately solve the problem. Generally, problem statements include three components:

1. A *vision statement* describing the ideal set of processes and technologies that will exist after the system is operational
2. An *issue statement* explaining the problem using specific issues
3. The *method* that will be used to solve the problem

In developing the problem statements, consideration should be given to those whom the issues affect (individuals, groups, stakeholders, etc.), the boundaries and the impact of the issues, and the risks of not solving them. Additionally, timing and location must be reflected in the problem statement,

that is, when and where the issues occur and when they need to be remedied. Further, the reasons why the issues need to be resolved should be emphasized. Finally, the problem statement must be written in a way that is clearly measurable and testable to ensure that the new system does solve the stated problem. An appropriate, well-defined problem statement should convince the audience, including management and other stakeholders, of the need to continue the project. Visualizing what could be along with what is and what could happen should provide assurance that a problem does exist and that it can be resolved.

4. Evaluation

Several activities occur during the **evaluation** stage of needs analysis. Once the data have been collected, they must be reviewed and assessed to create a clear picture of the current and desired processes, data sources, and issues. Next, the data should be arranged in a format useful for the next phase of the SDLC: design. Third, the data should be reviewed by the project team to gain additional perspective and encourage suggestions, noting any duplications or omissions. For example, consider whether data must be collected and stored in the new system or could be calculated from data already in the system. For instance, if employer-paid life insurance is twice an employee's annual salary, there is no need to store that value in the system, as it can simply be calculated from the existing salary data. In addition, it is important to consider how other areas of business interface with human resources and how HR data may come from, and be sent to, other systems. As an example, production or sales data may be used by HR as part of a performance appraisal or compensation process, but they would likely be provided from a non-HR module or system.

There are several ways of assessing and analyzing the system data, functions, and processes, and these may be organized in any way that assists in this process. For example, visual representation of priorities may be displayed in check sheets, graphs, Pareto charts, flowcharts, or data flow diagrams to support and summarize the analysis. When this information is organized, it can then be prioritized according to, for example, the time when it must be present or the level of importance, as shown below. The prioritization method is up to each organization.

Priority	Description
1.	Must be present at implementation
2.	Must be present within six months of implementation
3.	Nice to have, but not essential
4.	Not needed in the near future, but may be needed due to environmental changes
Importance	**Description**
1.	Mandatory
2.	Strongly desired
3.	Nice to have

The result should be an operational depiction of the HR system needs, including a visual representation and descriptive text that lists the particular processing required to support each function. These documents will serve as the primary reference for the remainder of the project, and they also serve as a key communication tool for HR staff, consultants, vendor representatives, and technical staff. For example, given that no organization has unlimited budget to implement all functionality desired by the organization, prioritizing ensures that the most important functionality will be given first focus. In fact, for many projects, desired functionality will often have to be eliminated because of budget or time constraints.

5. Reporting

The final stage of the needs analysis process, *reporting*, involves preparing a document that summarizes the findings and presents recommendations for the design phase. The final report should include an overview of the current systems and processes, along with a description of how a new system could address the issues and weaknesses with which the function deals. This report should contain the formalized **requirements definition**, the document that lists each of the prioritized requirements for the new system. The requirement definition can include specifications geared toward solving problems identified in the analysis as well as any that focus on new functionality that HR requires in the new system. These requirements should be written in such a way that when the new system is tested, each requirement can be verified as

being met.

Although the report can be, and often is, viewed as a sales presentation to management and other constituents that presents a business justification for continuing the project, it is also a roadmap for moving forward. The report becomes the basis upon which the new system will be designed. There is no standard format for the requirements report. Instead, the format will depend on the intended audience and corporate and/or information technology reporting standards. A potential outline for the report is shown in Figure 4.4. The written report is generally accompanied by an oral presentation where stakeholders can ask questions and receive additional information about the project.

Figure 4.4 Sample Report Outline

1. Executive Summary
2. Project Background
    - 2.1. Project Initiation
    - 2.2. Project Charter
    - 2.3. Project Scope
    - 2.4. Project Team
    - 2.5. Steering Committee
    - 2.6. Project Schedule
3. Current Systems
    - 3.1. Description
    - 3.2. Components and Functions
    - 3.3. Interfaces
    - 3.4. Strengths and Weaknesses
4. General Operational Requirements
5. Functional Requirements
    - 5.1. Function 1
        - 5.1.1. Function 1 Description
        - 5.1.2. Function 1 Requirements
    - 5.2. Function 2
        - 5.2.1. Function 2 Description
        - 5.2.2. Function 2 Requirements
    - 5.3. Etc.
6. Information Technology Requirements
7. Support Requirements
8. Next Steps
9. Appendices

Summary

Organizations faced with the need to update, upgrade, or implement changes to HR processes and to consider new software should follow a formalized, structured process to give them the best chance of success. In this chapter, we briefly introduced this structured process: the systems development life cycle that helps organizations better manage the design and implementation of new or upgraded systems.

The chapter further focuses on the analysis phase of the SDLC, particularly

on the needs analysis portion of this phase. Needs analysis is designed to help the organization discover the disparity between the organization's present HR system(s) and desired HR systems. The chapter outlines an effective, formal, multistaged approach that starts with naming the project team, reviewing current processes and systems, and determining future needs and priorities. The resulting requirements definition can provide the ongoing project team responsible for vendor evaluation and/or system design with a clear picture of what the organization requires and when it must be delivered. It establishes the structure for future phases of this project, as well as a framework for ongoing operations. Needs analysis can, therefore, rightfully be viewed as one of the most critical to the success of the entire project.

Key Terms

Discussion Questions

1. What are some critical success factors for effectively conducting an analysis of HRIS needs?
2. Explain how planning and analysis integrate and inform further steps in the SDLC.
3. Compare and contrast the different methods of data collection, explaining the conditions under which each is most effective.
4. Which prioritization method is most useful in establishing the appropriate values for system requirements, and why?

Case Study: "Planning the Needs of Other Organizations"

If you think a thorough, high-quality needs analysis is daunting on an internal project, imagine if you were an HRIS vendor and your job was to provide a best-of-breed system (see Chapter 3) that meets most of your many different clients' needs. Such an approach makes planning and needs analysis more challenging because difficult choices must be made as to the functionality that is sufficiently broad to go into a general market package. It is costly to vendors, and indeed may be infeasible, to include functionality that is so specific that only a small portion of a system's client base benefits from the function.

Consider the following hypothetical company, Benefast Partners, which provides a specific market niche HRIS product: benefits administration software. Its challenge: Provide comprehensive benefits administration software that meets the needs of a growing and complex benefits marketplace. According to Davis Hunter, a former employee of Benefast,

> Benefast Partners (name changed to protect confidentiality) was only doing defined benefit pension plans for large employers (20,000+ employees). When you focus your business opportunities on *Fortune* 100 companies, it limits your potential for growth to small and midsized markets. Given that there is competition in the market for small, medium, and large clients, there was no real way to expand. We were,

however, doing 401(k) retirement plan administration both on our proprietary system, designed and marketed for large employers, and on a purchased platform for smaller companies. We had interest from existing 401(k) clients to take on administration of their defined benefit plans, and we felt we had lost 401(k) business in the past because we didn't offer total retirement outsourcing, just 401(k).

It wasn't possible to charge small employers the kinds of fees necessary to implement their plans on our proprietary system, so our efforts centered on what could be done with the purchased system used for small to midsized 401(k) plans. We quickly determined that the purchased system's defined benefits platform wasn't sophisticated enough from a calculation standpoint to handle most of the complexity of defined benefit plans, so we decided to use a combination of the purchased system with the calculation engine component for the proprietary system.

We had a lot of needs analysis conversations with our colleagues in another office who were running the project. Given the multiple platforms involved, processing time was a huge concern. We decided to segment the market and serve only those customers who met a fairly stringent set of requirements. Basically, we built a system to serve clients whose plans were easy to administer. In other words,

1. No multiplan clients
2. No retirement modeling
3. No coordination of benefits, for example, no combination of 401(k) and defined benefit plans
4. Limited Web interface

So, based on this segmentation, we launched our new product with one of our parent companies (a bank). By the time we had signed our third client, we had already begun to move toward a fairly complex multiplan environment. Our fourth and fifth clients were even more complex. We were over budget and off schedule on everything, and then we started trying to figure out how to do coordination of benefits. We built a system for plans that were easy to administer—but plans that are easy to administer are few and far between in the marketplace, and those that

exist aren't typically managed by organizations shopping for benefits vendors.

Case Study Questions

1. How would you evaluate Benefast Partners' strategy?
2. What changes (if any) would you make going forward?
3. What methods would you employ to ensure that an HRIS package meets the majority of your clients' needs?

Industry Brief: Dan Staley, Partner, PwC

A systems development life cycle (SDLC) is critical for our consulting practitioners at PwC. First and foremost, SDLC provides everyone—our clients and consultants—a common structure by which to plan and execute the proposed work effort. We generally organize our contracts (statements of work) and associated deliverables/responsible activities around these stages. Second, SDLC provides a proven methodology or sequential order for key project activities. Although it seems embarrassingly obvious that one would, of course, plan before they designed or analyze before they implemented, you would be surprised at the temptation to "shoot before aiming" or rush to an answer before fully understanding the question. We see it time and time again when we are engaged to rescue troubled initiatives.

When I bought my first house, a few years after I'd graduated from college, I decided to install my own crown molding throughout. After borrowing my dad's compound miter saw and buying many planks of molding from the local home supply store, I was eager to make progress. Up the ladder I went for a quick measure of the wall, down and back to the work area to mark the wood with my pencil, and then "buzzzz" went the blade. Back up the ladder and . . . oops . . . I'd cut it too short and with the wrong angle. That piece was ruined. It didn't take me long to learn the importance of the Carpenter's Rule: "measure twice; cut once." The same is true of the early stages of SDLC. The planning and analysis phases, if short changed, are certain to doom whatever you are hoping to construct. Although the excitement is in the implementation phase, it is critical to study the problem first to avoid

building something that you or your clients do not need.

A few years ago, a client engaged our firm to quickly “fix their HR data” and provide an estimate to upgrade their HRMS from their older version to the latest version. The executives were frustrated with the inconsistent and corrupted data in the HR application and needed it fixed yesterday. They also believed that the newer version of the software would help address their issues. They conveyed that they already knew what the data issues were and just needed a few programmers familiar with the application to clean up the data over a few weeks’ time. After several conversations, we convinced them that a more thorough root cause analysis was required to truly understand the need. Although the client executives were not thrilled with the delay, the needs analysis ended up saving them from throwing good money after bad.

After several weeks of observing their users entering data, interviews with key business leaders and HR managers, extracting and assessing their data, reviewing and understanding the purpose of their reports and the data critical to running their business, we were able to report out our findings. These findings concluded that a different type of project was needed before any clean up occurred. We found that HR data entry was decentralized to roughly five different groups, and users were not trained consistently on how and where to enter data. The same data fields were being repurposed in the system and used in a wide variety of ways. Data fields most desired by the executive team to run the business did not even exist in the application and wouldn’t in the upgraded version either. Instead of “cashing their tail” on never-ending data fixes or upgrading immediately, which would not resolve any of their pain points, we suggested that they invest in more systemic changes that would have more immediate and lasting impact. Our recommendations included the following:

- Change their HR service delivery model—especially around how data are captured and entered (employing ESS, MSS, and a central support group when data must be keyed by HR).
- Update and deliver consistent training for HRIS users entering data.
- Add custom fields to the HR database to capture essential operational data elements not included in the current HRIS.

Our team suggested that we clean up (remediate) the current data only after

the first three items were addressed. This way we would be confident that it would not immediately be corrupted again a few weeks after we left. Taking the proverbial “step back” to perform a proper needs analysis was critical in this case, as it is most of the time. By measuring twice, we uncovered issues that the client hadn’t seen in their haste to attack the problem originally.

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5 System Design and Acquisition

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Editors' Note

Building on Chapters 3 and 4, this chapter focuses on the design and acquisition of an HRIS. Thus, the focus of this chapter is on the "design" phase of the systems development life cycle that was introduced in Chapter 4. The authors differentiate between the logical and the physical design of an HRIS, as well as emphasize the differences between the data and process views of a computer system. As will be discussed in this chapter, these differences are critical for the effective design of an HRIS that will meet the needs of the various stakeholders of the system, that is, HR and information technology professionals, managers, and employees. Data flow diagramming is discussed as a tool used to analyze and describe the HR processes prior to the actual physical design of the HRIS. In addition, the three choices or options that organizations face when moving into physical design are examined (i.e., do nothing, change processes only, or invest in a new or updated HRIS). All the effort involved in completing an accurate and comprehensive logical and physical design of the HRIS helps ensure that the acquisition of the system will be done properly. The chapter then continues with a discussion of how to develop a request for proposal and how to evaluate proposals received from outside vendors. Finally, the chapter closes with a discussion of how to assess the feasibility of a new system. This last section is a good lead-in to Chapters 7 and 14, which are focused on using HR metrics and analytics to calculate cost-benefit analysis for the acquisition of an HRIS.

Chapter Objectives

After completing this chapter, the reader should be able to

- Understand the difference between the data and process views of a system
- Understand the purpose and components of the data flow diagram (DFD)
- Understand the hierarchy of DFDs and the concept of DFD balancing
- Understand the three choices or options that organizations have when moving into physical design
- Understand the purpose of a request for proposal (RFP) and what information should be included in it
- Understand the various criteria used to evaluate vendor proposals
- Describe the various types of feasibility and their purpose in evaluating potential solutions

HRIS In Action

Larson Property Management Company is one of the largest property-management companies in California, with more than 1,000 employees. The company provides a full array of commercial management and development services. These activities include complete management services for commercial office and retail buildings and apartment complexes; the construction, repair, and maintenance of commercial properties; and financial management and billing services for commercial real estate clients. The company has experienced significant expansion over the past five years in response to the growth in apartment and commercial construction in southern California, and this expansion has resulted in the need to hire a large number of employees on an ongoing basis to staff its operations.

Larson Property Management has depended on a legacy HRIS to manage its applicant and employee databases. The system runs on a client-server computer system. The system was implemented approximately 10 years ago, prior to the rapid growth of the company and when the organization had fewer than 100 employees. The system’s functionality is limited to the

storage and retrieval of employee and applicant data. For recruiting purposes, the system requires a clerk to manually enter basic applicant data, the results of the application test, and whether or not an offer of employment has been made. Prior to this, applicants' files were passed around to those who reviewed the materials and were sometimes misplaced, so trying to locate a particular applicant's file was often a problem. The current HRIS has limited file storage capability for applicant and employee records and currently has reached its storage capacity.

Larson Property Management has decided to replace its legacy HRIS. One application module in the new HRIS that the company wants is a sophisticated applicant-tracking system (ATS). The primary objective of the ATS will be to provide a paperless hiring process. The basic functions of the new system will be managing the requisition and approval of job openings, storing resumes and job applications and retrieving through query functions the names of applicants who match job requirements, tracking a candidate's progress through the recruiting and selection process, and providing automated reporting functions. The company's managers also want an e-HR functionality that includes the Internet posting of job openings through the company's website and external job-posting services, application and resume submission through the Web and through kiosks at various office locations, staff ability to access and use the system remotely through a Web browser, and online resume- and application-scanning capabilities.

Part of the design phase is modeling the processes that will be used in the system for applicant tracking. For Larson Property Management, this modeling will allow the system analysts to design an efficient paperless hiring process.

Case note: As you read this chapter, keep the situation at Larson Property Management in mind. It will be the basis of the case analysis at the end of the chapter.

Introduction

Never tell people how to do things.

Tell them what to do and they will surprise you with their ingenuity.

—General George S. Patton (1947/1995)

The goal of this chapter is to provide a deeper understanding of the process through which a human resource information system (HRIS) is designed and acquired. This design and acquisition of an HRIS comprises but one phase in a larger systems development process. As noted in previous chapters, the larger development process is called the systems development life cycle (SDLC). As seen in Chapter 4 (Figure 4.1), the five generic phases of the SDLC are planning, analysis, design, implementation, and maintenance. This chapter focuses on the design phase by discussing briefly the role and features of the structuring of a system's requirements through process system modeling, during which analysts create data flow diagrams to model both the business processes that the system will use to capture, store, manipulate, and distribute data and the options facing the HR department as it moves into design. Next, the vendor–management relationship is covered, including the creation and use of a request for a proposal, the evaluation of vendor responses, and the choice of a vendor or vendors. Finally, the chapter ends with a discussion of the HRIS feasibility criteria.

Design Considerations During the Systems Development Life Cycle

As discussed in previous chapters, the SDLC is a structured set of phases focused on the analysis and design of information systems. The goal of the SDLC is to provide those organizations updating existing systems or designing new ones with a stronger, more structured process to follow. A report by the Standish Group (2004) provides evidence that, as the use of structured development techniques is increasingly practiced, system quality improves. At the same time, this report also found that fewer than 30% of systems projects are successful and more than 50% go live later than planned and are over budget. Given the wide variety of program needs in the HR department, such as recruiting, selection, training, performance management, and compensation, and the complexity of these needs, the importance of

following a structured approach to the development of an HRIS cannot be overstated.

Although each phase in the life cycle is important, the goal of this chapter is to focus specifically on the activities associated with designing the HRIS. The design of the HRIS can occur in two phases: logical and physical design. The design phase is separated into two components because each has a different aim and perspective. The **logical design** of a system focuses on the translation of business requirements into improved business processes, irrespective of any technological implementation. For example, a business requirement for organizations such as Larson Property Management is the acquisition of new employees. HR business processes typically include (1) identifying jobs requiring new employees and approving those jobs; (2) analyzing the requirements of those jobs; (3) posting those positions and recruiting applicants from the labor market; (4) tracking applicants through the recruiting process; (5) selecting from the recruiting pool, through the use of selection tools such as interviews, applicants that best fit the job requirements; and (6) bringing new hires on board and placing them in their jobs. The HR programs associated with these processes are (1) HR planning, (2) job analysis, (3) recruiting, (4) applicant tracking, (5) selection, (6) placement, and (7) record keeping.

Conversely, the focus and goal of **physical design** is determining the most effective means of translating these business processes into a physical system that includes hardware and software. To merge the phases together can invite the temptation to focus heavily on the physical aspects of the new system (hardware and software) at the expense of improved business processes. In addition, focusing on the physical aspects of a system can lead to premature decisions and the selection of physical solutions that may not be the most effective ones for the business processes identified.

For example, a new and improved version of software may appear on the market. Imagine that this software is designed to automate and help manage compensation systems based on a combination of base pay administrative features along with merit modeling, reporting and analysis, and bonus pay plan tools. However, a company purchasing this software because of its elegance may have made a serious error if the company’s top management is

planning to drop the bonus program in two years as part of the company's new strategic plan. Another example would be the failure to acquire needed software features due to lack of attention on processes. Of course, adequate logical design enables effective physical design. Revisiting the example of Larson Property Management, we can imagine a design scenario related to staffing and the acquisition of new employees in which a thorough and careful analysis of the staffing process (logical design) would permit the company to determine that it needs a particular level of workflow processing and Web enablement to track applicants and allow the posting of jobs online and online application to posted jobs (physical design).

Logical Design

As discussed in Chapter 4, once an organization has completed the analysis phase of the SDLC, which results in a comprehensive process analysis for the new HRIS, one of the key tasks facing the HR staff and development teams is to model the needs for the new system. There are two ways in which the system can be modeled: the physical model and the logical model. The physical model focuses on the computer technology for the HRIS, that is, on the hardware, software, networking plans, and technical manuals. The strength of this type of model is that it focuses on how the system will actually operate. In turn, this strength also becomes its weakness because, by focusing on the actual way the system will be implemented in terms of technology, analysts and HR staff may be constrained by the current, operational physical model. That is, HR staff members are familiar with the functioning of the current (i.e., legacy) HRIS they are using but, typically, not with the technological aspects of new systems or with the current technology available.

Therefore, system developers like to focus on the essence of the business processes independent of any technological implementation. To do this, logical models of the system are created. Logical models are HRIS models that could be operationalized in multiple ways in terms of the technology. For example, in the logical model, an organization might focus on receiving and processing applicant files. There are several physical ways in which an organization could implement this process. It could use a Web portal in an HRIS, a kiosk at a retail outlet, direct e-mail, or physical mail. The strength

of using logical models is that the HR staff and developers can focus specifically on the business processes, policies, and procedures instead of on technology. Marakas (2006) refers to this as “separating the ‘what’ from the ‘how’” (p. 116). By focusing on what the system does or needs to be able to do, the analyst and HR staff will be less likely to be distracted by or to focus on a single technology platform. In turn, they will be more likely to design a stronger solution.

Essentially, a **logical model** is similar to the blueprints for a home or an airplane. It provides the organization with an outline of the key business processes and goals for the system. Then, as the physical system is designed, these are translated into the hardware and software platforms that best fit the business’s needs. For an HRIS, there are two types of models created for the system: those focused on the system processes and those focused on the data the system captures.

Two Ways to View an HRIS: Data Versus Process

For any HRIS, the organization must look at the total HR system from two different perspectives: the data perspective and the process perspective.

The **data perspective** focuses on an analysis of what data the organization captures and uses, and on the definitions and relationships of the data, while ignoring how or where the data are used by the organization. For example, a system whose aim is employee recruiting would need data about the applicants and their knowledge, skills, and abilities (e.g., name, address, degrees received, work experience). The data perspective would focus on the important data to be captured, but would not be concerned with how the data are to be used within the organization. In addition, the data perspective focuses on the most efficient and effective way to capture the data to ensure accuracy.

The **process perspective**, conversely, focuses on the business processes and activities in which the organization engages and on how data flow through the HRIS. For example, a recruiting module from this perspective would consider business activities, such as receiving applications, sorting and scanning resumes to determine the interview pool, scheduling interviews,

reporting candidate information for legal purposes, and so on, but not the data definitions and relationships. The designer would focus on the specific business processes, including the input of the data into the system, the flow of data through the system, and the storage of the data, but not on precisely what data are captured and how they are best organized or stored. Essentially, process modeling uses tools to describe the processes that are carried out by a system.

A key question that the reader might be asking is, “Why should I care about these distinctions?” The reason the distinction between the process and data perspectives is important is that each represents a portion of the total HRIS, but neither provides the complete picture. By modeling each separately, the organization is better able to understand and communicate its needs to the technical staff (e.g., the project management team responsible for designing and implementing the HRIS and any external consultants, vendors, or software developers). In addition, while processes may change in the future, data generally represent the most permanent and stable part of a system. For example, employee data from prior systems are often converted into the new HRIS data format and transferred into the new system. This data conversion and migration process is a critical step in the implementation phase, and it provides a bridge and continuity between the legacy system and the new HRIS. This permanency of data and the more dynamic aspect of processes suggest the importance of dealing with each separately.

Over the past three decades, a well-established procedure for modeling information systems has been developed. The procedure is based on a process perspective that uses **process mapping**, also called data flow diagramming. A common aspect of all design methodologies is the use of diagrammatic modeling techniques. While the style of the charting symbols varies, the fundamentals are well established. Our focus in this chapter is on the creation and use of process models.

Logical Process Modeling With Data Flow Diagrams

A **process model** describes and represents the key business processes or

activities conducted by the organization, such as applicant tracking. The specific type of process model typically used by organizations is a **data flow diagram (DFD)**. A DFD is a graphical representation of the key business activities and processes in the HR system, the boundaries of this system, the data that flow through the system, and any external individuals or departments that interact with the system.

The focus of a DFD is on the movement of data between external entities (such as a job applicant) and processes (the applicant-tracking process) and between processes and data stores. Kendall and Kendall (2008) argue that DFDs have four distinct advantages over narrative (e.g., written) descriptions:

1. There is freedom from committing to the technical implementation of the system too early.
2. They provide a deeper understanding of the interrelatedness of systems and subsystems.
3. They allow for stronger communication of system knowledge to the employees, since the diagrams are in pictorial form.
4. They ensure a deeper analysis of the proposed system to determine if all business processes have been identified.

A DFD consists of four symbols (see Figure 5.1): the entity, the data flow, the process, and the data store. The **entity** represents any external agent (e.g., an individual, department, business, system) that either receives or supplies data to the HR system. For example, in an **applicant-tracking system (ATS)**, a manager could request that a job opening be posted, or an applicant could submit her resume online. In this scenario, both the manager and applicant are entities. Other examples of an entity are a manager inputting merit pay raise information on an employee into the payroll system or the production/manufacturing system inputting piece-rate production data about the number of products produced by an employee into the payroll system. Similarly, the time-and-labor module, which provides time-card information on employees and their start and end times on workdays, represents an entity for payroll systems. Because entities represent a specific person, place, system, or department, they are labeled with a noun in the DFD.

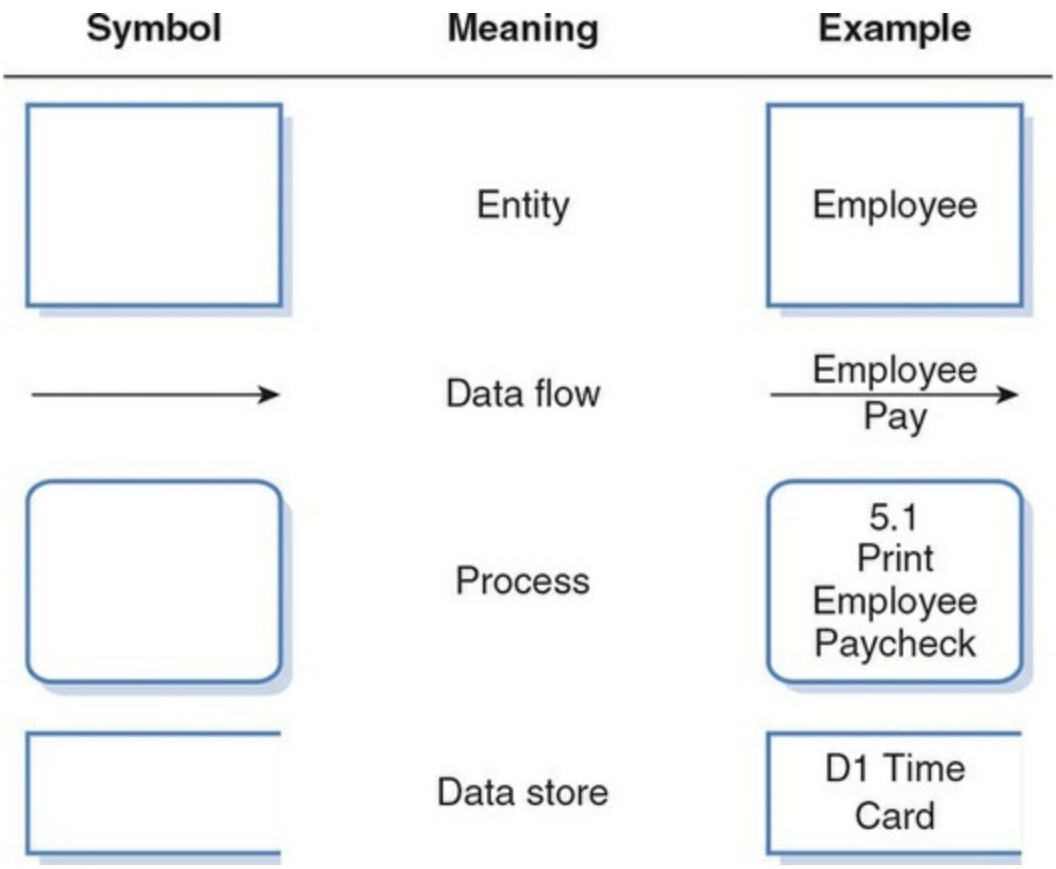
The **data flow** represents the movement of a single piece of data from point

to point through the system (e.g., from process to process, entity to process, or process to data store). As a data flow represents data about a person, place, or thing, it should also be labeled with a noun. The label of a data flow should describe exactly what data are contained in the flow. For example, a data flow labeled “Time Sheet” would represent an employee’s time sheet, and the exact data contained in the flow would be precisely defined as part of the diagramming process. Because DFDs describe the key business processes and the flow of data between them, *an important rule to remember is that all data flows must begin or end at a process.*

The third symbol in the DFD represents the **process**. A process represents a business activity or process. The goal of each process is to change or transform inputted data into a useful output (e.g., creating an applicant record, updating an employee record, creating a recruiting yield ratio report, reporting Equal Employment Opportunity Commission data on applicants). Since data are transformed as part of these processes, they should be labeled with action verbs, for example, *calculate, send, print,* or *verify.*

The final symbol represents the **data store**, in other words, the data at rest in the system or a repository of data. This repository could be a filing cabinet, a file on a desk, a computer file, or a database table. A data store contains data about a person, place, or department and should be labeled with a noun. Examples of data stores include employee files, applicant files, employee records, and customer or current benefits records. Data stores are typically identified with a “D*n*,” where D identifies that what is labeled is a data store and *n* is a number reflecting the data store’s unique identifier (D1, D2, etc.). The symbols and their use are illustrated in Figure 5.1.

Figure 5.1 Symbols of the Data Flow Diagram (DFD)



Creating and Using the DFD

Most DFDs for integrated business systems are very complex, consisting of hundreds to thousands of processes, data flows, and data stores. If all of these were included on a single diagram, it would make the task of developing and using the DFD too complex. Therefore, DFDs are organized by modeling the individual processes (such as the applicant-tracking process) and components (such as the recruiting module) of an information system. Furthermore, a series of DFDs are created to depict visually increasingly detailed views. The value of this approach is that all individuals involved in the logical design of the system can view the model at their own level of understanding and complexity. Viewing the model provides much better understanding than creating written documents to describe the model and all the processes.

The highest-level DFD developed is called the **context-level diagram**. This diagram describes the full system, its boundaries, the external entities that interact with the system, and the primary data flows between the entities

outside the system and the system itself. The context level diagram contains only one HR process, representing the system, data flows, and entities. This process is labeled with the system name and is identified as the context-level diagram. A sample context-level diagram for an ATS is shown in Figure 5.2.

The single HR process in the context-level diagram is then broken into greater detail on the **level 0 diagram** to provide a clearer picture of the HR business process. The level 0 diagram contains the major system processes and the data that flow between them. Each process should be labeled with a verb that reflects the action that the process conducts. In addition, each process is numbered consecutively starting with 1.0 (1.0, 2.0, 3.0, 4.0, etc.). It is important to note at this point that the context-level diagram and the level 0 diagrams should reflect and communicate the same information (see Figure 5.3).

This concept is called the *balancing of DFDs.* Notice that, although the level 0 diagram shown in Figure 5.3 has more detail than the context-level diagram, it contains the same inflows and outflows from management, applicants, and human resources. For example, on both levels, the three flows, “Application,” “Application Confirmation,” and “Application Decision,” flow between the Applicant entity and the system in the same way. Balancing DFDs is important because we want to ensure that all individuals are viewing and using the same model of the system. Otherwise, there is the risk that the system will not be designed appropriately.

In the same manner that the context level can be decomposed into a level 0 diagram, the level 0 diagram can be decomposed into *additional-level diagrams.* As with the context-level diagram, the level 0 diagram in Figure 5.3 also hides specific details about all the processing tasks within the HR system. Thus, the next-level diagram (the level 1 diagram) would break down the processes within the level 0 diagram to better portray and help staff to understand the HR processes in the system. This level of detail will, in turn, improve the accuracy of the logical design of the system. The same process of decomposition could occur at successive levels (level 2, level 3, etc.); however, this diagramming becomes a very complex task and is beyond the scope of this book.[1] The DFD is considered complete when it includes all the components necessary for the system being modeled.

[1] The interested reader seeking more information on developing DFDs, including the rules for their completion as well as the decomposition process, can check out the following resources: *The Structured Analysis Wiki*, written by Ed Yourdon (http://yourdon.com/strucanalysis/wiki/index.php?title=Introduction), or any of the systems analysis and design textbooks listed in the reference section of this book.

Figure 5.2 Context-Level Diagram

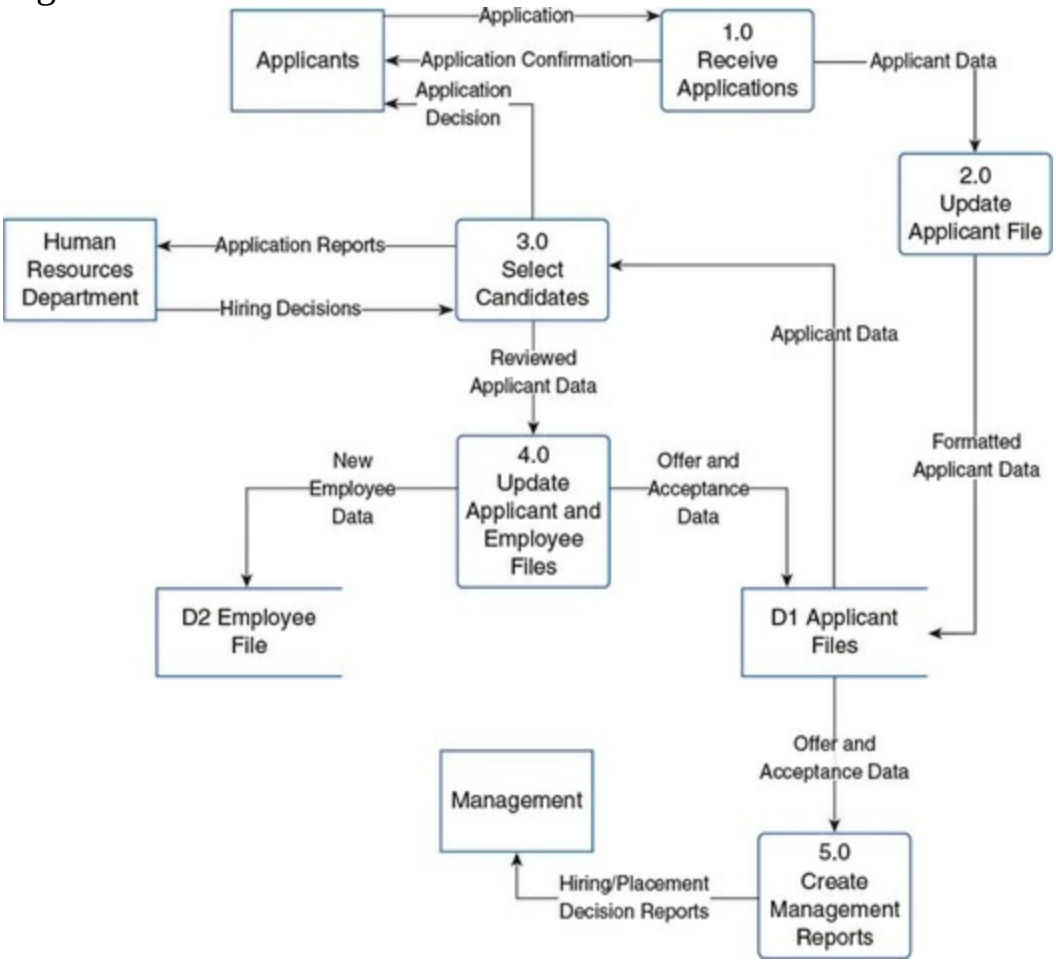
The DFD can also be used as a tool for analyzing the current system versus the desired system. In addition, DFDs are often used for **business process reengineering,** in an effort to improve the system. For example, through the DFD, the analysts designing the ATS for Larson Property Management might discover that data (e.g., rating scores) from a lower-level manager's interview of job candidates currently flow back to the HR department for approval prior to allowing the applicant file to proceed to the next-level manager. Through this analysis, they could find that this step is unnecessary in the new HRIS because the system would use a decision rule, based on the minimum score needed to proceed, to forward the applicant data to the next manager automatically upon an applicant receiving a passing score.

Physical Design

As was discussed in earlier chapters of this book, the acquisition of a system is the culmination of a series of important steps. By this point, the organization should have a strong understanding of its current operations, a

set of requirements for the new system, and a new logical model for how it wishes the system to operate. Once the new system has been designed and logical models of the new system have been tested against the business requirements, the organization will move to the physical design phase. The major goal of this phase of the SDLC is to translate the logical model and requirements into a physical system, including all hardware, software, and networking.

Figure 5.3 Level 0 DFD



Major activities in this phase include (1) determining whether or not there is value in continuing the system design and actual implementation processes, (2) determining hardware and software options and requirements, (3) determining where to obtain the hardware and software (e.g., by in-house development or commercial software purchase), (4) developing an implementation schedule, and (5) working with potential vendors to assess and select software if system software is to be obtained externally. For most

organizations, these activities will typically mean that the HR staff specialists (e.g., the recruiting manager) will work closely with HRIS specialists and the internal information technology (IT) staff, as well as with software vendors and any external consultants brought in to help with the physical design of the system. The extent of involvement of these various stakeholders depends on the size, scope, and type of HRIS developed.

During the physical design phase, the HRIS and IT staff will focus heavily on how any new software and hardware will fit within the current **IT architecture**. In addition, IT and HRIS staff will provide technical recommendations on the relative value and cost of building the system internally or purchasing an off-the-shelf package from a commercial vendor. The HR staff will also work with the external vendors to ensure that the focus of the system is on the business requirements and not the technology itself. It is also important at this point to remind the HR staff to be very careful of scope creep, or the growth in project requirements and scope.

Three Choices in Physical Design

The first step in this design phase is to determine how to proceed with physical design. First, the organization has the option of doing nothing. Although this may seem to be counterintuitive because much time and money typically have been spent on the analysis and design process to date, there may be important organizational or environmental reasons for not proceeding. For example, on completion of a thorough analysis and logical redesign of the HR processes, a small organization in the southern United States was faced with a public lawsuit, and it was forced to delay the final design and implementation of the project until this was settled. In other instances, companies have postponed proceeding after learning that a target software vendor was in the process of a major revision of the software product.

The second option is to *make changes to only the HR business processes without implementing new or upgraded technology.* Before any time or money is spent on new technology, it is important that the organization address all proposed business process changes and determine if these processes can be handled using the current HRIS technology. In the book

Good to Great, Collins (2001) suggests that one important difference between good companies and great companies is that good companies view technology as a solution, whereas great companies see technology as a tool to be used to support great business processes. Furthermore, Brynjolfsson and Hitt (1998) found that organizations were much more likely to increase productivity and performance when they coupled any technology changes with business process changes.

At this point in the process, it can be easy to forget that the goal for the development of the new system should be to use technology to support HR practices, making them more efficient and adding value to the organization; an organization should not get so caught up in the promise of a new technology with industry "best practices" that it ignores actual needs. In HR or IT, although using best practices is desirable, if these practices are not compatible with the specific needs of your organization as identified in the needs analysis, any business process and technical changes are likely to be less effective.

The final option that an organization can choose is to *implement the business process changes along with new or upgraded technology.* There are three basic ways that this can be done: build it, buy it, or outsource the development. Organizations that choose the first approach—to build the technology internally—will take responsibility for the development of the software and hardware. The advantage of this approach is that the organization will control all aspects of the development, including the look and feel and functionality. Using this approach, the organization will be able to write software to meet 100% of the business's requirements. Finally, internally building the software can also provide increased flexibility and creative solutions for the issues within the HR business processes.

There are several shortcomings in building the HR system internally from scratch. First, it can be much more expensive to implement than an off-the-shelf solution. In addition, since it is a unique application, the amount of software testing and the developmental risk are much higher with this approach than for an off-the-shelf system. Further, for this approach to work, the organization must already have or readily be able to obtain the technical, functional, and project management skills necessary to build the system

effectively. For most organizations, obtaining what is needed to build the system is a daunting task because software development is generally not part of their **core competency**, and they likely do not have the staff and resources available to complete such an undertaking. Finally, since an HRIS is typically one of at least several core modules that are part of the overall enterprise resource planning (ERP) system, building the module in-house often leads to issues and challenges associated with integrating the HRIS with the other core modules, including the data warehouse component used to integrate data as a basis for business intelligence features.

For most organizations, the second approach of buying prepackaged, **commercial off-the-shelf (COTS) software** fits many needs. These systems can range from small, single-function applications costing a few thousand dollars to large-scale, ERP software packages costing millions of dollars. The advantage of using this approach to acquiring software is that the systems are well tested and proven and can be purchased and implemented in a short period. For this reason, most of the HR software adopted and used today is COTS. The good news for organizations considering the adoption of a COTS solution is that most business operations are fairly generic, so there are applications available that should meet the majority of the needs of most organizations. The bad news is that even the best system will rarely meet all the specific needs of the organization, with most meeting about 70% of the organization's needs. Thus, organizations choosing to purchase a COTS solution should be prepared either to work with the vendor to customize the system to meet their unique needs or to change their processes to fit with the software (and thereby opt for what is referred to as the "vanilla" approach). As mentioned briefly before, the risk of adapting your business processes to the software is that the business processes supported by the software may be incompatible with the way your organization operates, which can result in increased costs or reduced competitive advantage. In addition, when an organization implements a vendor's upgrade in the future, it will likely be necessary to redo whatever **customization** was done during the initial implementation.

The final approach to developing the software is to outsource the development to an external company or to obtain access to existing software through an **application service provider (ASP)**. The greatest advantage of

outsourcing is that an external software development can bring vast resources, experiences, and technical skills to design a much more effective solution than would otherwise be possible. However, outsourcing the development can be risky. For example, by outsourcing, the firm may expose confidential internal information and business processes to an external organization. Second, outsourcing may not lead to reduced time and expense for the organization because many of the tasks that would need to be completed if the software were developed in-house would still need to be completed *with* the external software developer.

As can be seen from the previous discussion, there are advantages and disadvantages to each approach for software development. Thus, the decision as to which approach to use will be based on multiple factors and may differ from organization to organization and project to project. In addition, an organization need not rely on a single approach. For most organizations, the solution chosen is often a combination of in-house and external development. The decision regarding which approach to choose is based on a series of factors, including the nature of the business process; the size, technical skills, and project management skills of the software staff; and the development time frame. Table 5.1 contains a matrix of how these different factors may influence the approach chosen.

If the decision is made to purchase and customize COTS or to outsource development, the organization will need to work closely with external software vendors. Thus, vendor selection becomes a very important decision.

Working With Vendors

Although building a new HRIS from scratch with internal resources may be a viable option for some organizations, by far the most common decision is to work with an external vendor to develop or acquire the system. To do this, the HR staff will need to work closely with both the internal IT department and external vendors to ensure that the business process requirements and all technical requirements are presented to the vendor. The first step in this process is to develop a **request for proposal (RFP)**.

TABLE 5.1 ■ Software Acquisition Strategies

	Development Strategy		
	In-House	COTS	Outsource
Business Need	**Unique**	**Standard**	**Noncore Function**
In-house skills	Functional and technical expertise exists	Functional expertise exists	Functional and technical expertise not in-house
Project management skills	Project has skilled and experienced project manager	Project has a manager with experience to coordinate and manage vendor relationship	Project has manager with experience to manage an outsourcing relationship
Time frame	Flexible	Short	Flexible or short

Source: Adapted from Dennis, Wixom, and Roth (2006).

Source: Adapted from Dennis, Wixom, and Roth (2006).

Alliance Programs

To assist organizations that wish to implement a customized solution, most of the major HRIS vendors (e.g., Oracle, SAP, Infor) supplement their mainline enterprise solutions by investing in alliances with other independent software vendors (ISVs). The primary goal of these **alliance programs** is to provide a total solution to make vendors' products more attractive and effective for their customer base. A secondary goal for the HRIS vendors is to create an "ecosystem" of solutions that can compete more effectively with other HRIS applications. The larger the ecosystem or number of partners in a program, the bigger the footprint the HRIS application will have. A side effect is that the HRIS provider appears to be more "open" from a technical perspective. In fact, Oracle and SAP are actively selling their technical integration capabilities (middleware) alongside their HR applications.

An RFP is a document that solicits proposals and bids for proposed work from potential consultants or vendors. An RFP defines the organization's goals and requirements for the new information system. It provides the details that define hardware, software, and services requirements. For the

organization, it provides a structured approach that minimizes the chance of omitting important criteria. On return from vendors or consultants, it simplifies the vendor comparison process by providing a format to elicit consistent and complete responses.

The RFP provides an opportunity for the HR department to record systematically what its staff will need the system to do. As part of this process, any remaining implicit assumptions should be made explicit. Basically, the RFP will define what is needed and what is not needed in the system. In addition, the RFP begins the communication process and relationship building with vendors.

Although there are many different factors that will determine precisely what should be included in the RFP, experts in the field have argued for the inclusion of a key set of components. Table 5.2 presents an example of these key factors, adapted from recommendations made by the Society for Human Resource Management and the work of Hinojos and Miller (1998).

Table 5.2 is an excellent starting point for developing an RFP, but it should not be taken to include all items that may be required. Those developing an RFP for an organization should keep in mind their unique situation and add or subtract what is included as appropriate for their needs. The information in this table is also very general in nature, and how it is developed will be different for each organization.

When developing the RFP, organizations should keep several things in mind. The first recommendation is to *focus on the business requirements.* Given that the system is being considered in association with business process changes, an excellent place to begin the development for the vendor is to review the requirements and logical redesign of the business processes. These should then be communicated to each vendor.

Associated with this requirement, the second recommendation is to *be specific.* After all the effort given to the needs analysis and the redesign of business processes, very specific requirements will be available and should be included in the RFP. It is important to be specific as to your organization’s needs because, if you are not specific, you risk allowing the vendors to determine what is included in the final system. Although it is desirable to

work with a vendor to develop the final system, it is important that the system be developed to meet your specific business needs, not just designed to match the system a vendor has available. Furthermore, an RFP that is too general may not be screened in sufficient detail by the vendor, leading to a product that has too much detail and is too complex and too expensive for the business's needs. The overall objective of the RFP is to have the vendors propose system hardware and software to meet the specific requirements you have identified for your new system.

The third recommendation is to *keep it simple.* One of the temptations in developing an RFP is to include all possible business and technical requirements in it. The problem with including many technical details in the plan is that vendors may review the RFP and screen themselves out because they think they cannot fill the needs outlined in the RFP. For example, it would be important to ask whether a benefits system allows for benefits reports, benefits administration, and so on. Conversely, the RFP would want to stay away from including requirements as to length of fields, types of passwords used, and so on, which do not focus on business needs but instead are focused on technical and physical design issues. Essentially, if something is not important to the HR department and reflective of the business processes modeled in the DFDs, it is best not to include it.

The fourth recommendation is that organizations need to be aware that some *current HR practices will likely differ from the best practice practices (e.g., workflow and processes) embedded in the HRIS under consideration.* Thus, organizations need to be open to redesigning their HR functions to increase efficiency, match the workflow and processes provided in the new HRIS, and be more consistent with product offerings. As more and more vendors are moving to cloud-based deployment, the alternative of customizing the software to your organizational processes may not be possible, or may be expensive and inefficient. For example, traditionally, applicant tracking systems involved only applicants and HR staff in the data input, flow and processes used in applying for and managing the recruitment process. In contrast, newer talent acquisition approaches have adopted more of a shared approach that includes workflow to line managers and other stakeholders who increasingly are involved in recruiting and staffing responsibilities. Thus, during the design phase, the analysis of a vendor response to the RFP

provides an opportunity for the project team to rethink their HR processes and consider newer approaches that are reflected in vendor offerings.

The fifth recommendation is to *work closely with the HRIS and IT staff* as the RFP is developed. The professional staff will be responsible for working with the vendor to ensure the smooth installation and maintenance of the HRIS. Therefore, it is important for the HR staff to work closely with the information systems professional staff to make sure that any essential technical considerations are included. For example, if there are existing systems that need to provide information to or receive information from the system, then this should be included. In addition, if there is a certain platform (e.g., UNIX, Windows) that the organization has experience with and with which it would like the system to integrate, this too should be included.

TABLE 5.2 ■ Recommended Components of a Request for Proposal

- Data about you
  - Who you are as a business
  - Company name, size, scope, industry, annual sales, locations, etc.
  - Business requirements
  - Required business processes, functionality, and project scope
  - Technical requirements
  - Does it need to work with a particular operating system, existing organization systems, etc.?
  - Delivery time frame needed
  - Is there a desired target implementation date?
- Requested data from vendor
  - Vendor details
  - Company name, size, scope, annual sales, experience, etc.
  - Number of implemented applications
  - System pricing
  - May include license fees, maintenance charges, training costs, implementation costs, and support costs
  - System details
  - Functionality included in the system
  - If customization is necessary, how will this be addressed (timing, delivery, cost, support, etc.)?
  - Supported technology now and in the near future
  - Customer support options
  - Training options
  - Customer references
  - Find out user and organizational experiences with the system.
  - Ask these references for other companies they know using the system to broaden your knowledge (after all, the vendor is likely to provide you with clients who have had positive experiences).
  - Sample contract terms

Vendor Selection

After the RFPs are sent, the vendors will then evaluate them to determine if they can provide a solution that will fit the specified RFP parameters. If the HR and IT staff have put together a strong RFP, then they should get a set of vendors who have a better understanding of the company's specific needs and who can provide a better-tailored response and proposal for the HRIS. After receiving the vendor responses, you will have the opportunity to evaluate the relative strengths and weaknesses of each vendor. To do this, you should consider several things and assess software options according to a number of criteria. These are described below.

Functionality

As you assess the different vendor responses, it is important to evaluate how fully the functionality of the HRIS meets the HR needs. For example, a software product that meets 70% of the organization's needs will be less desirable than one that meets 98% of its requirements. On the other hand, software that meets 98% of the organization's needs but has no additional functionality may not provide the organization with the opportunity to grow and expand its options in the future, so it may be less attractive than a product that meets 90% of your HR needs but allows for growth over time. It is important that the HRIS implemented today is able to change as the organization grows. Otherwise, within a few years, the organization will have to go through the entire systems development process and purchase or develop an entirely new solution. Finally, an HRIS that will meet your organization's needs with minimal customization for actual use would be more attractive than one requiring significant customization.

IT Architecture and IT Integration

The next issue focuses on the IT architecture for the HRIS. The organization will need to know whether the HRIS will be a stand-alone system, a networked system, a Web-enabled one, an externally hosted or cloud based system, and so on. In addition, the organization will want to know with what technology or platform the HRIS has been developed (e.g., UNIX, Linux, Windows) and what separate database(s), if any, the HRIS requires. Finally, it is critical to ascertain the extent to which any HRIS will integrate within the broader corporate IT architecture. An HRIS that can more readily interact and communicate with operations, manufacturing, and sales can provide a much stronger return for the company than one that stands as an isolated entity. The easier the integration with the broader IT architecture, the easier it will be to implement and use the system. In today's environment of employee self-service and Web portals, the ability to provide remote access to employees can also be a plus as different systems are considered. Today's cloud-based systems are growing in popularity due to their lower up-front costs, decreased capital hardware expenditures, lower overall costs, rapid implementation and updates, and seamless integration between ERP modules

(more information on cloud-based systems are found in Chapter 3). Finally, if functional HR systems are being considered from multiple vendors, the extent to which they can be integrated, rather than requiring middleware, and communicate with each other also becomes important.

Price

Although price will ultimately play a very large role in the selection of an HRIS, price should be secondary to the goal of finding a system that meets your process needs. At the same time, price will ultimately determine which system is selected. The ultimate cost of the system will include the visible costs, such as the cost of hardware and software, as well as the less visible costs, such as customization costs, employee training costs, licensing fees (e.g., site licenses, per seat licenses), upgrade costs, and the cost of system operation and maintenance over time. HRIS costs and cost-benefit analyses are covered in more detail in Chapter 7.

Vendor Longevity and Viability

As with any purchase decision, it is important to evaluate the quality of the vendor itself. The good news is that a number of vendors have been in business for over 20 years, so vendor longevity is usually not an issue. In today's environment, the viability of vendors can often be assessed through their responsiveness to existing clients and their history of providing timely upgrades and increasingly flexible systems. Furthermore, the HRIS vendor marketplace has been undergoing some consolidation as companies seek to better position themselves to provide value-added services across the HR functional spectrum, so the vendor you sign with today may end up merging with another company. A listing of several sample vendors can be found in Table 5.3. In addition, the **International Association for Human Resource Information Management (IHRIM)** provides an online buyers' guide for those interested in adopting HR software (www.ihrimpublications.com/Buyers_Guide/BG.php).

Assessing System Feasibility

At this point in the design process, it is very important that you stop and consider whether or not the system will work for you. Although the system may meet all the requirements as defined in the requirements document, it still may not be feasible to implement for several reasons. Therefore, it is important to conduct a thorough feasibility assessment of the project. A feasibility assessment should go beyond the traditional economic metrics and should include multiple dimensions, such as technical, operational, human factors, legal, political, and economic.

Technical Feasibility

Technical feasibility focuses on the current technological capabilities of the organization and the technological capabilities required for the implementation of the proposed system. As part of any assessment of technical feasibility, the HR staff must work closely with systems analysts and technical staff to determine whether or not the current technology can be upgraded to meet the needs of the organization or whether an entirely new technological architecture will be needed to implement the proposed system changes.

TABLE 5.3 ■ Sample Vendors

Vendor Name	Website	Twitter	Focus
Infor	www.infor.com	@Infor	ERP
Oracle	www.oracle.com	@OracleHCM	ERP
SAP	www.sap.com	@SAPHCM	ERP
ADP	www.adp.com	@ADP	Core HRIS
Ceridian	www.ceridian.com	@ceridian_US	Core HRIS
SuccessFactors (SAP)	www.SuccessFactors.com	@successfactors	Core HRIS
Workday	www.workday.com	@Workday	Core HRIS
Ultimate Software	www.ultimatesoftware.com	@UltimateHCM	Core HRIS
OrangeHRM	www.orangeHRM.com	@orangeHRM	Open Source CORE HRIS
Benefitfocus	www.benefitfocus.com	@Benefitfocus	Benefits Management
Myco Portal	www.mycoportal.com	@MycoPortal	Small Business

Typical questions an organization might ask as part of a technical feasibility assessment are as follows:

1. Do the hardware and software exist to implement this system? Are they practical to obtain?
2. Do we add on or patch the current software or start from scratch?
3. Does our organization have the ability to construct this system?
4. Can we integrate the new system with our current systems?

Operational Feasibility

Operational feasibility focuses on how well the proposed system fits in with the current and future organizational environment. For example, a system, despite meeting technical feasibility criteria, may make such a drastic change in how the organization operates that it may not have a strong chance of being successfully implemented. For example, a series of research studies in information systems has found that the more compatible a system is with an employee's current ways of working, the more likely the employee will be to use the system (Agarwal, 2000). Therefore, when a new system is highly incompatible with current practices, HR staff or designers might seek to change or decrease the scope of the project to reduce these incompatibilities.

In addition, operational feasibility assesses the extent to which the project fits within the overall strategic plans of the HR and IT departments as well as within the organization's overall strategy. Other areas addressed as part of the assessment of operational feasibility include the likelihood of meeting the proposed implementation schedule and delivery date. The HR staff and developers must work together to ensure that the schedule will meet any critical operational deadlines, that resources are sufficient to meet the schedule, and that the schedule takes into account key organization dates (e.g., annual budgeting).

A second area of operational feasibility focuses on human factors. An assessment of the human factors feasibility focuses on how the employee uses and works with the system, on the system's usability, and on the training the employee receives. The usability of the system reflects the effectiveness and efficiency of the system to the employee and is often characterized by the usefulness of the system to the employee and the ease with which he or she can use the system. It can reflect how intuitive the interface is to navigate, the effort an employee must put into learning to use the system, and how

effective the system is in supporting the employee's work.

Do not underestimate the importance of human factors in determining the operational feasibility and ultimate success of a system. Over the past 20 years, hundreds of studies have found that the usefulness and ease of use of a system play a large role in system use and adoption.[2] In addition, recent research has found that usefulness estimations can be accurately assessed by employees early in the development process but that perceptions of ease of use may evolve as employees gain direct experience with the software (Davis & Venkatesh, 2004). These human factor considerations will be covered in Chapter 9 in more detail, along with suggestions as to how to solve the acceptability issue.

[2] Interested readers are encouraged to read Ma and Liu (2004) for a thorough review of this research.

Typical questions asked as part of the assessment of operational feasibility would include the following:

1. How well does the system fit within our organizational context? Will this make us better?
2. How much will our organization change because of the new business and technical changes?
3. How long will this take to do, and does the schedule fit our business's needs?
4. If we have to squeeze, what might we be able to eliminate?
5. Do we have or can we get the personnel to do this?
6. Can people use the system?
7. What kind of training do we need?

Legal and Political Feasibility

Legal and political issues also play a very important role in assessing the feasibility of an HRIS. The best-designed and best-implemented system can end up causing major headaches for the organization if it violates existing laws and regulations. This point is even truer for an HRIS than for many other types of information systems because existing laws and regulations play

a larger role in HR than in other core business functions (as will be discussed in Chapter 8). For example, if the HRIS fails to maintain specific employee performance records correctly, legal challenges of wrongful discharges will be more difficult for the company to defend against.

Political feasibility focuses on the political environment of the organization in which the HRIS is being implemented. Issues such as power redistribution involving loss of individual or department control can have major political implications that can affect the effectiveness of the implementation. What is interesting is that political issues can undermine the implementation of a new HRIS more quickly and completely than any technical shortcomings. The challenge here is that, while political feasibility may be fairly easy to identify, it can be challenging to effectively address. Individuals who are negatively affected by the implementation of the system (or who perceive themselves to be negatively affected) are likely to undermine, resist, or disrupt its implementation, either overtly or covertly. Thus, it is important to understand and anticipate the political consequences of a system implementation at this point, before implementation is started. These issues are discussed more fully in Chapter 6.

Typical questions asked as part of a **legal and political feasibility** analysis include the following:

1. Does the implementation of this system infringe on existing copyrights?
2. Are we violating any antitrust issues by implementing the system?
3. Do we have contracts with other companies that don't allow use of the new software?
4. Does the system violate any governmental policies?
5. Does the system violate any foreign laws? (This question would be significant for global companies who have operations in multiple countries where different laws require different practices supporting the capture and use of HR data, for example.)
6. Who is likely to resist the implementation of the system?
7. Who may "win" or "lose" as a result of this implementation?
8. What is the risk of system sabotage?

Economic Feasibility

The final aspect of a feasibility assessment is evaluating **economic feasibility**. The goal of an economic feasibility analysis is to determine whether the costs of developing, implementing, and running the system are worth the benefits derived from its use. To do this, an analyst would identify the appropriate costs and benefits of the HRIS and assign precise values to each. Then, these costs and benefits should be subjected to a thorough cost-benefit analysis. As mentioned earlier, Chapter 7 provides comprehensive coverage of how to assess the costs and benefits of an HRIS.

Summary

The goal of this chapter was to discuss the factors that contribute to a more effective system design strategy. First, we discussed how the HR staff and consultants translate the requirements from previous phases of the SDLC into improved logical business processes. We then discussed how these new processes are modeled through logical modeling tools such as the DFD. DFDs are important because they allow the HR staff, consultants, and programmers to have a common model of the system from which to work and because they can be used to identify potential shortcomings not yet identified in the new system. In addition, because DFDs are hierarchical in approach, they allow for the system to be viewed at multiple levels of specificity. This makes them a useful tool for communicating with all relevant actors in the systems development process, while also being technical enough to allow developers to best determine how to translate business requirements into the new HRIS. Given that the cost of making changes becomes significantly more expensive once the physical design of the system has been undertaken, it is important that these models be as effective and accurate as possible to avoid system rework.

Third, we discussed the options available for the firm when developing the final physical design for the new system. One option available to firms is not to change their existing practices. Other options include building the software internally or sourcing the software through external vendors. The chapter also briefly outlined the steps of working with a vendor, from the RFP through the selection of the vendor, and it provided several suggestions for getting the most out of the RFP and the vendor selection process. Finally, whatever approach is chosen for the final design, any selected physical system must be

assessed as to its feasibility. Although budgeting committees will pay especially close attention to the profitability of the system, we also explained the importance of considering different types of system feasibility. Although this phase of the SDLC can be complex and challenging to manage, we believe that following a structured and disciplined approach such as the one outlined will result in the development or acquisition of a system that is a stronger fit for the organization.

Key Terms

request for proposal (RFP) 105
technical feasibility 109

Discussion Questions

1. What is the difference between the data view of a system and the process view of a system? Why is this distinction important when designing a new system?
2. Discuss four reasons that a DFD is a stronger tool than a written narrative of the business processes.
3. How do companies use an RFP when sourcing software? What are the key items that should be included in the RFP?
4. If you were advising a firm on developing an RFP, what would be some key suggestions you would make for improving the effectiveness of the RFP?
5. When evaluating vendor offerings, what are the key factors that will help your firm determine the best software product to acquire?
6. Even if a system pays for itself financially, an organization must conduct a thorough feasibility study. What types of feasibility should be assessed, and what information does each type of feasibility assessment provide the organization?

Case Study: Vignette Continued3

Larson Property Management Company is one of the largest property management companies in California, with more than 1,000 employees. The company provides a full array of commercial management and development services. These activities include complete management services for commercial office and retail buildings and apartment complexes; construction, repair, and maintenance of commercial properties; and financial management and billing services for commercial real estate clients. The company has experienced significant expansion over the past five years in response to the growth in apartment and commercial construction in southern California, and this expansion has resulted in the need to hire a large number of employees on an ongoing basis to staff its operations.

Larson Property Management has depended on a legacy HRIS to manage its

applicant and employee databases. The system runs on a client-server computer system. The system was implemented approximately 10 years ago, prior to the company's rapid growth and when it employed fewer than 100 employees. The system's functionality is limited to the storage and retrieval of employee and applicant data. For recruiting purposes, the system requires a clerk to manually enter basic applicant data, the results of the application test, and whether or not an offer of employment has been made. Prior to this, applicants' files were passed around to those who reviewed the materials and were sometimes misplaced, so trying to locate a particular applicant's file was often a problem. The current HRIS has limited file storage capability for applicant and employee records and currently has reached its storage capacity.

Larson Property Management has decided to replace its legacy HRIS. One application module in the new HRIS that the company wants is a sophisticated applicant-tracking system (ATS). The primary objective of the ATS will be to provide a paperless hiring process. The basic functions of the new system will be managing the requisition and approval of job openings, storing resumes and job applications and retrieving through query functions the names of applicants who match job requirements, tracking a candidate's progress through the recruiting and selection process, and providing automated reporting functions. The company's managers also want an e-HR functionality that includes the Internet posting of job openings through the company's website and external job-posting services, application and resume submission through the Web and through kiosks at various office locations, staff ability to access and use the system remotely through a Web browser, and online resume- and application-scanning capabilities.

Part of the design phase is modeling the processes that will be used in the system for applicant tracking. For Larson Property Management, this modeling will allow the system analysts to design an efficient paperless hiring process.

Larson Property Management is well aware that the design stage of the SDLC is critical for the successful implementation of the new ATS. However, there is considerable confusion about how to proceed with this phase. The HR and IT professionals assigned to the ATS committee have

been meeting to plan the new system. From their planning and needs analysis, it is clear that a new HRIS application is needed, can save considerable time, and can result in more accurate storage and retrieval of applicant data for cost-benefit and other management reports.

The company has had several vendors provide presentations, with each vendor outlining its particular approach to the design of an ATS. But these presentations were primarily focused on the physical design of the new ATS. The HR and IT committees must now begin the design process, which must be completed in three months.

Case Study Questions

1. Based on the material in this chapter, design a three-month operational plan for the ATS.
    1. In your plan, make certain you differentiate between the logical and physical design of the ATS. Which one should be done first? Which one is more important?
    2. Describe the importance of the data view versus the process view for the design of the new ATS.
    3. Who are the important stakeholders to be considered in the design of the ATS?
    4. How will you determine whether these stakeholders need the information that the new ATS will deliver?
    5. Based on your personal knowledge of recruiting by companies, develop a DFD with at least two levels.
2. Based on the work you have completed for Question 1, provide a brief outline of the RFP that is to be sent to the HRIS vendors.

[3] Note that this is the case from the vignette, plus added material.

Industry Brief: Jeffrey D. Miller, Deloitte Consulting

The world of human resource information systems (HRIS) has shifted over the past decade. Now more than ever, organizations are driving changes in human resources (HR) and their associated system based on business needs. All industries are witnessing increased global competition, which is

increasing the need to manage talent and costs of HR services. An increase in generational expansion in the workforce is driving the needs to increase focus on employee engagement. These challenges are disruptions. HR has a clear opportunity to lead through the disruptions by focusing its strategy on resolving these issues. Transitions in HR operating models, alignment of policies, and business processes are the key for HR to resolve the HR challenges facing its business.

Through all of the disruption, technology is HR's enabler. Organizations must remember this principle. Whether the organization is investing in a custom portal and related technology, enhancing an existing infrastructure, or implementing a cloud-based solution, the same rule applies: *Technology is the enabler, not the solution to the business challenges.* Using new technology to drive a poorly designed policy or process will result in a bad process, employee experience, and unmet executive-level expectations.

Organizations are changing their HR service delivery model to enable a greater impact in all industries. The focus: Adapt the operating model to attend to business issues and movements in the market. This shift requires HR to look at how it operates across many facets including recruiting, career management, acquisition and divestiture management, and how its technology enables the business needs.

The same global competition in the market is propelling changes in talent management. To remain competitive, there is a dramatic shift in the focus on understanding their talent base and aligning the skill growth to expansions and shifts in the market. The right process changes driven by the right information to make decisions related to recruiting, succession planning, and learning are critical to this effort.

The generational shift cannot be ignored. Many organizations are seeing up to four distinct generations resident in their workforces. Each generation has different needs and ways of working professionally and personally. This creates a need for HR and management to be sensitive and adapt the methods of employee engagement in day to day work, performance, provisions for career trajectory and learning. This area is especially sensitive to being overly burdened with technology—relying on exchanges and messaging through technology rather than employing the technology to concentrate and foster

conversations.

Selecting the right technical solution for the HR needs is significant. Most applications offered meet the majority of any organization's requirements. The real difference is in how the applications fit in driving the HR objectives and business needs of the organization. The selection, and ongoing monitoring, is becoming more closely aligned with strategy in many organizations. The selection is *not a one-time decision*. It is something that has to be closely managed. Innovation in HR technology is moving at a staggering pace. This pace will continue. The world of HR technology offers multiple options and investments levels. For HR to lead through business disruptions, the monitoring and review of technology's fit with HR business objectives must be an ongoing and formalized role in the organization structure.

In summary, to have the greatest impact, HR must focus on understanding the true business and market direction of its organization, adapt its processes and policies to contribute to meeting the business needs and then implement the model and technical solutions, which enables the right level of information to enable decisions, employee engagement, cost management, and ease of maintenance.

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6 Change Management and Implementation

Richard D. Johnson

Michael J. Kavanagh

Editors' Note

Perhaps one of the major obstacles in the use of an HRIS is its implementation. The IT and HR literature are filled with stories about the failure to implement well-designed and well-developed computer technology. This failure has occurred not only in HRIS implementation, but also in operations, marketing, and financial computer-based systems. Although technical challenges will always remain in implementing an HRIS, the major challenge to successful implementation is often more behavioral than technical. In this chapter, the authors examine the important role that change management plays in the implementation of an HRIS. This chapter briefly introduces change management and its role in HRIS Implementation. It then introduces the various models of change that can inform HRIS analysts and employees about how to help manage the change management process. The chapter then turns to a discussion of the factors that can impact the success or failure of an implementation. Finally, the authors discuss the various organizational and individual factors that can affect the successful implementation of a new or re-automated HRIS.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the management of change through the perspectives of various change models
- Discuss and compare the various change models
- Discuss the elements important to successful HRIS implementation
- Understand the factors that contribute to HRIS implementation failure
- Discuss the various system conversion approaches
- Discuss the importance of integration of the HRIS with the other systems in the organization

HRIS In Action

The Arizona Department of Administration, Human Resources Division, manages the largest human resources system in Arizona. The department administers the state's human resource information system (HRIS). The customer base includes every state agency, with the exception of the universities, that relies on HRIS to accurately pay state employees and manage health insurance coverage. Currently, HRIS processes information for over 40,000 employees and calculates the state's annual payroll of $2.5 billion. HRIS is the system that all state employees use to access their pay, leave balances, and W-2 information.[1] The HR Division's early experience with implementing an HRIS provides a good backdrop to the topical coverage in this chapter.

[1] See Arizona Department of Administration, Human Resources website at http://www.hr.az.gov/HRIS/HRIS_About_Us.asp.

The HR Division initiated a program in 2002 to update its HRIS. According to department estimates, the new HRIS would "produce more than $100 million in cost savings over the next 10 years by automating functions previously performed by administrative staff and [by] reducing turnover due to increased employee satisfaction" (Office of the Auditor General, 2005). The implementation of the new system proceeded in phases: Phase 1 was

completed in December 2003 and Phase 2 was supposed to be completed in 2004.

The implementation plan failed to meet planned milestones by a wide margin, and in fact exhausted most of the project budget early into Phase 2. With the loss of funding, the HRIS project staff was reduced from 60 to 18 positions. As a result, some state agencies had to rely on in-house systems or manual processes to ensure they had the necessary personnel information processing capabilities.

Compounding this situation was the fact that the implementation team had been slow to address some of the user requests for Phase 1 modifications, some of which are needed to correct programs that do not function properly. The net result of this poor management of the HRIS implementation project was that state agencies had not realized the anticipated efficiency savings from the new system (Office of the Auditor General, 2005).

In 2005, the HR Division considered a new plan to restart the project. Some of the questions the change leadership team was thinking about included: Did they have the right change management competencies to manage this project? What were the likely obstacles that they would face during this next phase of the project—and could they prepare for them in advance? Could they deal with the resistance from some agency managers and users? What mistakes made in the earlier effort could they avoid going forward? And finally, they wondered if the HR Division was ready for this new implementation project—that is, what other steps were needed to ensure that the HRIS project would be successful?

We hope to answer many of these questions in this chapter.

Introduction

> *It's not the progress I mind, it's the change I don't like.*
>
> —Mark Twain

> *There is nothing more difficult to take into hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things.*
>
> —Niccolò Machiavelli

Statistics measuring the success of systems development efforts are not very encouraging. Inordinate delays, excessive budget overruns, and employee dissatisfaction plague HRIS implementations. “Despite good faith efforts by organizations, analysts, and users, a majority of systems are either abandoned before completion or fail to meet user requirements” (Browne & Rogich, 2001, p. 224). It has been estimated that globally the problem of information technology (IT) failures conservatively costs organizations $3 trillion (Krigsman, 2012). One expert in the field noted that, at best, only one-third of these kinds of initiatives achieve any success at all (Beer & Nohria, 2000). Even more troubling is the fact that only 13% of completed projects are considered successful by the executives who sponsor them (Lemon, Bowitz, Burn, & Hackney, 2002). A major contributing factor to the failure of these projects is ineffective change management (Schmidt, Lyytinen, Keil, & Cule, 2001).

Successfully introducing an HRIS into an organization requires an effective blend of good technical, good organizational, and good change management skills, because employees have to adapt to both a technical change, and a change in their job requirements and processes. As Lorenzi and Riley (2000) remind us,

> A “technically best” system can be brought to its knees by people who have low psychological ownership in the system and who vigorously resist its implementation. The leader who knows how to manage the organizational impact of information systems can sharply reduce the behavioral resistance to change, including to new technology, to achieve a more rapid and productive introduction of information technology. (p. 116)

Effective change management is a critical core competence that all human resources (HR) leaders must master. By better understanding the competencies related to managing change, HR professionals can better manage change in their organization and reap the rewards that accrue to successful change initiatives. However, as the HRIS literature suggests, the track record of most change initiatives—be they restructuring, introduction of new technology, mergers, process improvement, or **reengineering**—is poor. Clearly, learning to effectively manage technology change is an important managerial competency. In this chapter, we focus on the change management processes associated with the implementation of a new or upgraded HRIS.

Change Management

Change management (CM) is the systematic process of applying the knowledge, tools, and resources needed to effect change by transforming an organization from its current state to some future desired state (Potts & LaMarsh, 2004). Change is not instantaneous. It requires the organization to focus on three key elements: the current organizational state, a transition, and a future organizational state. Very few people like changes in their lives, particularly when it affects their jobs. Therefore, effective communication with employees regarding the why, how, and benefits of change for the organizational and employee is important. Successful change requires a "critical mass of people who are committed, are willing to change and will sustain their new behavior to align with the needs of the change" (Miller, 2004, p. 10). CM focuses on altering the attitudes and behaviors of employees, and it can be used on large or small projects. As such, any change model chosen must address the important content, people, and process issues during each phase of the change initiative.

If the change is planned, the process typically is systematic and includes both a vision and a plan to ensure the change activities are on target with respect to cost, time, and expected results. Consider this example. When the catalog retailer Lillian Vernon undertook a major transformation of its IT infrastructure, the initial results proved dismal. What happened was that the change management team—which included the president and the chief information officer (CIO)—failed to take change management seriously. In particular, they overlooked the importance of assessing and managing

readiness for change. “Employees resisted mightily, avoiding training and blaming new applications for their frustration. . . . The employees had already made up their minds that the system was not going to work, and they didn’t want any part of it” (Paul, 2004, p. 80). The net result was that the company fell short of its ambitious timeline for implementation and missed an opportunity to use the new information system to improve overall performance. What Lillian Vernon failed to do was create a sense of urgency and help the employees understand how the new IT system would benefit them personally. The lesson here is that implementing change goes beyond just installing the physical equipment and system and must consider factors such as employee attitudes and needs, and the organization culture and setting.

The Change Management Process: Science and Art

Organizations are in a constant state of change. Some of the forces for change are external, such as the appearance of new technology, while others are internal, such as a decision to downsize the workforce. Regardless of the reason for change, it must be effectively managed or chaos will occur. The person who is in charge of the change is referred to as a **change agent** or a change leader. This change agent can be internal to the organization (e.g., director of HR) or external to the organization (e.g., a consultant).

The process of managing change typically begins with a gap analysis. A **gap analysis** indicates the differences between the current state of affairs in the organization and the desired future state. Sometimes this analysis is done by senior management or the HRIS project team, and sometimes it is done through questionnaires distributed to employees. After the gap analysis has been completed and plans for the change process have been made, the next stage is to begin the implementation of the change. In addition, a major consideration in any change initiative is **resistance to change** from organizational employees. Change is never easy and when faced with change, a natural reaction by employees is to express fear, concerns, struggle, and opposition. This is natural because employees may feel that the technology has been brought in because they were performing poorly, or that perhaps there will be lay-offs in the company.

Unfortunately, there is no magic formula or easily prescribed processes to guarantee success to overcome this resistance. The reality is that change is "messy, complicated, and its outcomes are easily swayed by a host of factors that only complicate our ability to ensure success" (Herold & Fedor, 2008, p. xiii). There is both art and science to managing change. The science of managing change is the framework for diagnosing, planning, and executing change projects. Although some might suggest that applying the "right" change model will ensure success, Lawler and Worley (2006) caution that although designers of the change models "suggest that with the right interventions, most, if not all, organizations can make significant changes. We are not at all sure that this is true" (p. xv). If this were true, then more companies would be successful in executing change initiatives. Notwithstanding the authors' caution above, the fate of many change efforts will be worse without a change model to guide change leaders in the process. We discuss several frameworks or models of change in the following section.

The art of managing change is what distinguishes the great from the not-so-great change agent in making a real difference through the application of the science of change management. It is understanding the culture and behavior of the organization and employees, and determining how to best apply change techniques within the organization. Successful change projects requires both the application of art and of science.

Models of the Change Process

In this section, we introduce and describe a general model of the change process and then four specific models of organizational change that have received considerable attention in the change management literature: Lewin's change model, Gleicher's change equation formula, Nadler's congruence model, and Kotter's eight-stage change model. Each of the models below help draw our attention to the elements important in the successful management of any HRIS implementation project.

Overview of Organizational Change

Anderson and Anderson (2001) suggest that all change models fall into two

categories: frameworks and process models. Frameworks focus mainly on topical areas that change leaders need to pay attention to when executing a change initiative. These models are good planning and diagnostic tools to help in understanding the complexities inherent in organizations and the interdependencies associated with change. Process models are more robust in that they provide more direct guidance on what should be accomplished and in generally what order (Anderson & Anderson, 2001). Just as a roadmap is useful in getting a driver from point A to point B, so also do process models serve as a roadmap and action plan for any transformation effort. “Given the complexity of change, and how to actually get to a new state, a process roadmap is essential” (Anderson & Anderson, 2010, p. 20). Finally, some models can be classified as hybrid, with characteristics of both a framework and process model.

Burke (2008) outlines five reasons why the use of change models is helpful to change leaders:

1. *Categorize information.* With literally thousands of bits of information related to a change initiative, models help categorize the information into manageable compartments.
2. *Enhance understanding.* Given that a change model has a beginning, middle, and end, if problems arise in any of these areas, we can use this information to help diagnose the problem and where action is required.
3. *Interpret data about the organization.* There is much interdependence with any change effort. As such, a model helps us recognize these linkages and take appropriate action to remedy any problem areas (e.g., structure and strategy).
4. *Provide common language.* A model helps provide a common language and vocabulary to discuss the change with stakeholders and the change team.
5. *Guide action.* Most importantly, a model helps provide the roadmap mentioned earlier. The sequence of actions and potentially the priority of those actions (depending on the robustness of the model) helps guide the change journey and enhances the potential for success.

There is no silver bullet with change. Leading any change initiative is a complex activity, and one model of change cannot be viewed as superior for

all organizations. As Schaffer and McCreight (2004) remind us, “because each firm has its own work processes, culture, and competencies, a given change formula may work well in one but fail miserably in the next” (p. 33). The choice of change model to adopt will most likely flow from prior experience or trial and error and be consistent with the culture of the company. In many cases, the adopted model will be a hybrid, with elements taken from more than one of the existing models.

Selected Change Models

Lewin’s Change Model

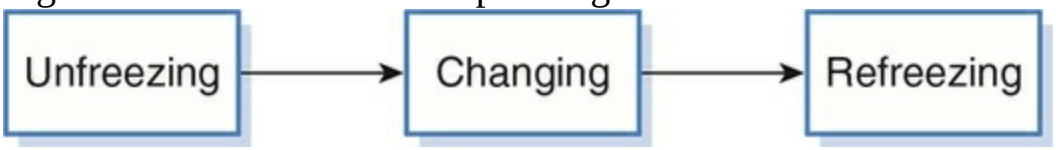
One of the earliest, and key, contributions to organizational change is Kurt **Lewin’s three-step change model** (see Figure 6.1). Lewin’s (1946) framework serves as a general model for understanding planned change, and has been used to explain how information systems can be implemented more effectively (Benjamin & Levinson, 1993).

Lewin’s change model conceives of change in terms of a modification of the forces that stabilize a system’s behavior. In particular, Lewin envisioned a dynamic in which there are two sets of opposing forces—those that are focused on maintaining stability and the status quo and those driving change. When there is a balance between these two opposing forces, we have what Lewin called a state of “quasi-stationary equilibrium.” To alter that state and enhance the probability of change, we must decrease the forces that oppose the change, while simultaneously increasing the forces for change.

To better understand these forces, we can use a procedure called **force-field analysis**. To develop a force-field analysis, create two columns on a sheet of paper. In one column, list the forces that drive or support a change in an HRIS, and in the other column, list the forces that will inhibit the change. It is helpful to also assign a relative potency or strength to each force listed. By plotting the forces, we can better understand which forces need to be strengthened or diminished to bring about change. Lewin suggested that the path of least resistance, that is, modifying those forces maintaining the status quo, would produce less tension and resistance than would increasing the

forces for change; thus, the former is a more effective change strategy than the latter.

Figure 6.1 Lewin's Three-Step Change Model



The key to understanding this approach, at the individual level, is to see change as a profound, dynamic psychological process (Schein, 1996). This psychological process involves painful unlearning and difficult relearning as one cognitively attempts to restructure one's thoughts, perceptions, feelings, and attitudes. Lewin's change model consists of three steps: unfreezing, transition, and refreezing.

Unfreezing

At the outset, every change project requires getting people to change their minds and behavior regarding the old way of doing things and to embrace the new state. Employees need to "see the purpose of the change, agree with it, be supported by rewards and recognition, have the skills to perform the new activities, and see key people modeling the new behavior" (Warhaftig, 2005). This means that the quasi-stationary equilibrium (or status quo) needs to be destabilized (unfrozen) before the old way of doing things can be discarded (unlearned) and new behavior successfully adopted (Burnes, 2004). Unfreezing is sometimes accomplished through a process of "psychological disconfirmation." By introducing information that shows discrepancies between behavior desired by organization members and those behaviors currently exhibited, managers can motivate individuals to engage in change activities.

However, the **unfreezing** process is not easy to accomplish. Schein (1996) argues that three processes are necessary to ready people for and motivate them to change: (1) disconfirmation of the validity of the status quo, (2) the induction of guilt or survival anxiety, and (3) creating psychological safety. Schein suggests that, for any change to occur, some form of dissatisfaction or frustration with the status quo must be presented. People need to know what

drives the need for change, why they should change, and where they are headed. In addition, they should know what will and will not change. They should also know the business rationale for change. Further, managers should help employees understand what's in it for them if they change. Finally, managers should address the rewards or consequences of changing or not changing.

Here, Schein's "survival anxiety" comes into play. Providing a reason for change is not always enough. We also need to convince people that, if they do not change, individual and organizational goals will be frustrated. This is what Kotter (1996) calls creating a sense of urgency. Without a sense of urgency, "people won't give that extra effort . . . they won't make needed sacrifices. Instead they will cling to the status quo and resist initiatives from above" (p. 5).

Psychological safety refers to mitigating the anxiety that people feel whenever they are asked to do something different or new. People are concerned about losing their identities, looking dumb, and losing their effectiveness. This anxiety can be a significant restraining force to change. Without sufficient psychological safety present, change leaders will find the road to change filled with more obstacles than they planned on. We can address psychological safety by addressing employee needs. Employees want to know: What must I do differently? What are the new ways I will have to work? How do I learn the new things that I'm going to have to do? Who's going to teach me? Am I capable of making the changes that I will need to make?

Changing

Whereas unfreezing creates the motivation to change, changing, or what Bridges (2003) calls transition, focuses on helping change the behavior of employees. Bridges defines **transition** as "a three-phase process that people go through as they internalize and come to terms with the details of the new situation that the change brings about" (p. 3). Not getting everyone through the transition phase puts the outcome of the change project in jeopardy. The transition phase consists of three key stages: ending ➔ neutral zone ➔ new beginnings (pp. 4–5):

1. *Ending:* “Before you can begin something new, you have to end what used to be. You need to identify who is losing what, expect a reaction, and acknowledge the losses openly. Repeat information about what is changing—it will take time to sink in” (Cameron & Green, 2004, p. 108).
2. *Neutral zone:* The step between the old and new way of doing things is a “neutral zone,” where people need to make the psychological adjustments necessary to say goodbye to the old and begin to welcome the new. In the neutral zone, people feel disoriented, motivation falls, and anxiety rises. Consensus may break down as attitudes become polarized.
3. *New beginnings:* This final step is about coming out of the transition and making a new beginning. In this stage, people develop new identities, experience new energy, and discover a new sense of purpose that makes the change begin to work.

As Bridges (2003) reminds us, if change agents

> don’t help people through these three steps in the transition process, even the most wonderful training programs often fall flat. The leaders forget endings and neutral zones (Steps 1 and 2); they try to start with the final stage of the transition. And they can’t see what went wrong! (p. 6)

Refreezing

Refreezing, the final step of transition, seeks to stabilize the organization at a new state of equilibrium and to ensure that the new behaviors are relatively safe from regression (Burnes, 2004, p. 986). This often requires changes in the organization’s culture and norms, policies, and practices. We address culture in a later section.

Change Equation Formula

When initiating an organizational change project, it’s important early on to

determine how ready people are to accept and implement the change (Burke, 2002). **Gleicher's change equation formula**, as modified by Dannemiller and Jacobs (1992), helps us assess this degree of readiness as follows:

$$C = (D \times V \times F) > R,$$

where *C* is the change, *D* the dissatisfaction with the status quo, *V* the vision, *F* the first steps toward the vision, and *R* the resistance to change.

If we refer to Lewin's (1946) force-field analysis discussed earlier, *D*, *V*, and *F* are all "forces for change," while *R* represents the "forces against change." Gleicher's change equation formula provides a simple and straightforward perspective that reveals the possibilities and conditions at work in organizational change. Note that all three forces for change must be active to offset the forces against the change, which are usually manifested as resistance to change from organizational members. The change program must address *dissatisfaction* with the present situation, present a clear *vision* of the future and what is possible, and demonstrate knowledge of the *first steps* necessary to reach the vision. If any one of the three is missing, the product of the equation will tend toward zero and *resistance to change* will dominate.

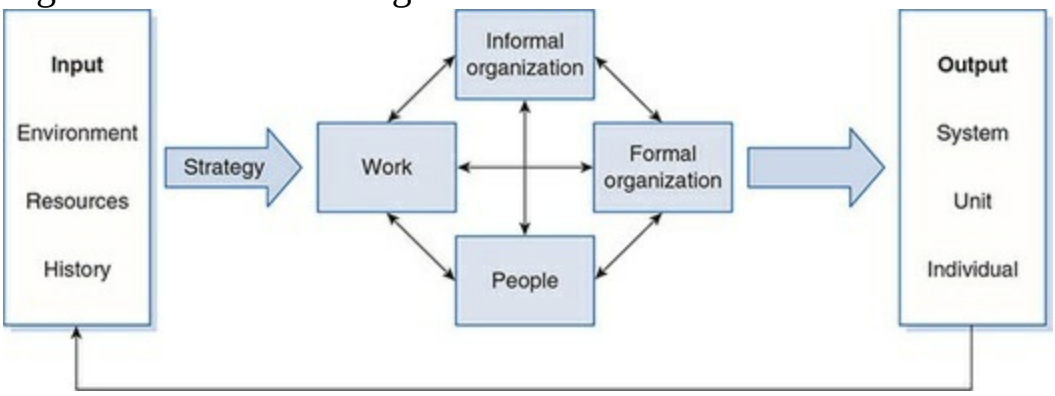
In sum, this "change formula is deceptively simple but extremely useful. It can be brought into play at any point in a change process to analyze how things are going. When the formula is shared with all parties involved in the change, it helps to illuminate what various parties need to do to make progress" (Beckhard & Harris, 1987, p. 104).

Nadler's Congruence Model

According to David Nadler (1998), one of the key steps in understanding and managing change is to first fully understand the dynamics and performance of the organization. Without an understanding of the varied issues affecting performance, successful change may be misdirected by focusing on the symptoms rather than the true causes of a problem. A useful tool that helps change leaders understand the interplay of forces that shape the performance

of each organization is **Nadler's congruence model** (Figure 6.2). The model is based on many years of academic research and practical application in a wide range of companies and industries.

Figure 6.2 Nadler's Congruence Model



Nadler's congruence model is an organizational performance model that is built on the view that organizations are systems, and only if there is congruence (i.e., "fit") between the various organizational subsystems can we expect changed and improved performance. As reflected in the model, the basic components of any organizational system include *inputs, outputs,* and *the operating organization.* The operating organization is composed of four components: (1) work activities, (2) the people that do the work, (3) the formal organization, and (4) the informal organization.

This model proposes that effective change management means paying attention to the alignment of all four components. Change agents cannot assume that changing one component will cause the other elements to fall into place (Nadler, 1998). Cameron and Green (2004) use an apt metaphor to highlight this important point:

> Imagine tugging only one part of a child's mobile. The whole mobile wobbles and oscillates for a bit, but eventually all the different components settle down to where they were originally. So it is with organizations. They easily revert to the original mode of operation unless you attend to all four components. (p. 104)

If alignment of each of the components—work, people, structure, and culture

—with the others is deficient, then performance will suffer. The greater the fit or congruence, the greater will be the organization's ability to manage a change process. There are several benefits in using the congruence model (Mercer Delta Consulting, 2003, pp. 10–12).

1. If we use a computer metaphor, at its core, the model depicts both the "hardware" and "software" dimensions of an organization. The hardware represents the strategy, work, and formal organization—how the firm is organized to coordinate, communicate, and motivate the workforce in accomplishing its vision and goals. The software represents the social dimension of the organization—its people and the informal processes (e.g., shared values) that shape the behavior and performance of employees.
2. The model helps us understand the dynamics of change by allowing us to predict the impact of change throughout the organizational system. When leaders conduct a gap analysis to compare results with expectations, it may trigger a review of strategy and a reassessment of what change is needed to achieve stated goals and objectives. This reevaluation may lead to changes in work and formal organization. Unfortunately, at this point, too many change leaders stop without undertaking the difficult but critical task of reshaping the firm's culture to align it with the new strategy.
3. Finally, the model helps change leaders see organizations not as inflexible, static structures, but as organic, dynamic sets of people and processes that are interdependent. It helps us recognize that managing real change is a function of several complex dimensions. It provides a useful "mental model" for understanding organizational problems and for enhancing our ability to pinpoint a solution.

Kotter's Process of Leading Change

Kotter's eight-stage change model (1996) was developed after studying more than 100 organizations undergoing change. The model offers a process to manage change successfully and avoid the common pitfalls that have beset failed change programs (see Figure 6.3). We can view his approach as a vision for the change process, one that calls attention to its key phases.

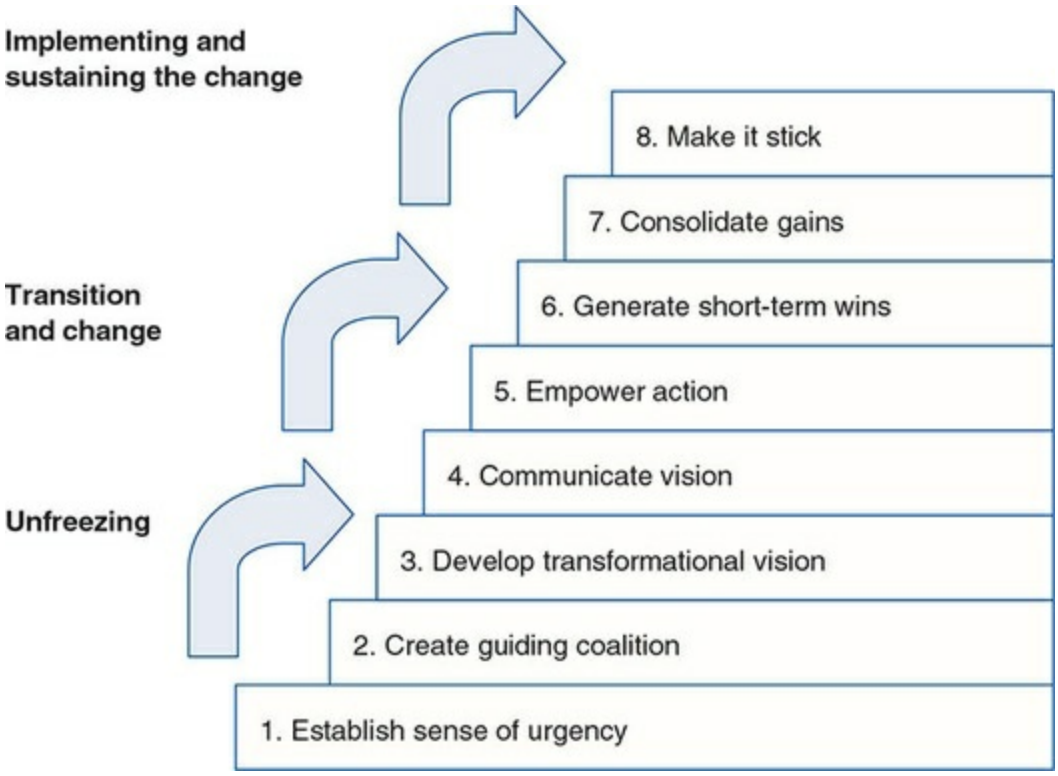
The model provides two key lessons. First, the change process goes through a series of phases, *each lasting a considerable period of time*. Second, critical mistakes in any of the phases can have a devastating impact on the momentum of the change process. As can be seen in Figure 6.3, the first four stages coincide with Lewin's "unfreezing" first stage. The next three stages focus on introducing new practices into the organization. Finally, the last stage focuses on grounding the changes in the corporate culture, which coincides with Lewin's third stage, "refreezing."

The model indicates that all the stages should be worked through in order to effect successful change. Skipping a step or getting too far ahead in the change process without a solid base may create problems. Without the follow-through that takes place in the final step, the changes may not stick.

Important Reminders Regarding Change Models

The change models described above fall under the umbrella of traditional philosophy of change. These approaches generally follow a linear, rational model in which the focus is on controllability under the stewardship of a strong leader or "guiding coalition." Linear change models assume that change involves a number of predictable, reducible steps that can be planned and managed. In other words, the change agent can choose from a menu of formulaic approaches that supposes that organizational change can and should be a controlled and orderly affair. As such, these models appear seductively simple and imply that success is guaranteed if they are followed to the letter. But, as Graetz and Smith (2010) note, there are several shortcomings worth noting to these models.

Figure 6.3 Kotter's Eight-Stage Change Model



1. Managers and change agents cannot control organizations the same way that an operator can control a machine made of moving, but inanimate parts.
2. The process models often ignore the human factor—treating individuals as automatons rather than active partners in the change process.
3. The models presuppose that employees will respond enthusiastically and uniformly to their leaders' call to arms.

Because the traditional approach to change is concerned with stability and control, what is emphasized in these models is management's singular story about why the change is necessary and ignores the many other distinctive stories unfolding around them in the organization narrative. As a result, the risk is that the principal response by managers may be to *not* listen to, but to silence, dissident voices. These risks should be kept in mind as the organization implements any change initiative.

Next, we turn our attention to the factors that contribute to HRIS implementation failures.

Why Do System Failures Occur?

Increasingly, the failure to successfully implement an HRIS has less to do with technology, but instead has more to do with the skills of the change leader, and the people and organizational issues related to the change. A review of the change literature has identified a number of key factors beyond the change management processes that contribute to IT system implementation failures (see Figure 6.4). Although no one single factor is the culprit, Lorenzi and Riley (2000) suggest that "a snowball effect is often seen, with a shortcoming in one area leading to subsequent shortcomings in other areas" (p. 117). We have grouped the key factors related to HRIS implementation failures into four main categories: leadership, planning, communication, and training.

Leadership

Lack of executive and managerial support is one of the main reasons that HRIS implementations fail. Without top management support, organizations lack the funding, approvals, and leadership necessary to implement, integrate, and maintain the system. Individuals given the responsibility to manage the HRIS project are often very knowledgeable in HR or IT, but they cannot lead a major change project effectively unless they possess strong leadership and communication skills. They must be able to communicate clearly, prioritize projects, make tough decisions, manage people effectively, and navigate the political environment (Kandel, 2007). Any successful major change initiative must also be driven by a strong and stable project management team comprised of key executives, department heads, managers, and frontline employees who are committed to the change and who can work together as a team. With respect to leader role and behavior, Higgs and Rowland (2011) identified five broad areas of leadership competency needed in the change process:

Figure 6.4 Reasons for IT System Failure

Leadership	• Lack of executive support • Lack of strong leadership and change management skills in project manager • Lack of recognition for team's efforts • Lack of accountability for implementing the change
Planning	• No clear vision for the change • Failure to define a clear and comprehensive project scope • Lack of a comprehensive project plan • Failure to define fully the functionality of the system • Insufficient project staffing; staff turnover and complacency • Insufficient project funding • Roles and responsibilities not clearly defined or understood by everyone • Failure to meet budget and deadlines • The change leadership team doesn't include early adopters, resisters, or informal leader • Inadequate testing of the system
Change management	• Culture and level of readiness for change are not assessed prior to the start of the project • Change leaders fail to respect the power of the culture to kill the change
	• No strategies to nurture or grow a new culture • The change isn't piloted, so the organization doesn't learn what's needed to support the change • Organizational systems and other initiatives aren't aligned with the change • End users are not involved in the process • Lack of a plan for user resistance/rejection • Processes are not reengineered
Communication	• Lack of a comprehensive communication plan • Ineffective ongoing communication with all affected stakeholders • Failure to customize communications to different audiences • People leading the change think that announcing the change is the same as implementing it
Training	• Inadequate or poor-quality training • Poor timing of training—too early or too late • People are not enabled or encouraged to build new skills • Lack of ongoing training

1. Creating the case for change
2. Creating structural change
3. Engaging others in the process and building commitment
4. Implementing and sustaining change
5. Facilitating and developing capability

It is also important to highlight that the literature on leadership clearly shows that teams with effective leadership will have significant performance advantages over those that do not (B. Anderson, 2010; Thomas, 1988). Change is not a process that can be simply managed; it needs to be led. Leadership makes a significant difference to chances of achieving change goals (Battilana, Gilmartin, Sengul, Pache, & Alexander, 2010).

Planning

Effective planning is essential to change management. Each successful project has a clearly identified project scope and strategy that outlines key business requirements and project goals. It is important to keep team members on the same page and working toward the same outcome. Additionally, a clearly defined project scope will prevent scope creep from occurring. **Scope creep** is the enlargement of the original project scope as defined in the project charter. Although there may be legitimate reasons for scope changes, such as changing business needs, scope creep can be challenging to control and may have unintended consequences on the change process, the timeline of the project, and its costs. The risk of scope creep is magnified because organizations often begin HRIS implementation projects without a clear definition of the project scope. The project scope must be defined in advance and should identify the project objectives, priorities, goals, and tasks, which will serve as the guiding principles for the team throughout the project's life cycle.

Inadequate funding and staffing further contribute to project failure. Organizations often consider the initial start-up costs for an HRIS project but fail to consider fully the costs of the change management process, of ongoing training, and of the support and maintenance of new systems. Change leaders must look at the big picture and the resources that will be required to

implement and maintain the system successfully.

One key resource often overlooked is the adequate staffing of the project. Change leaders make the mistake of thinking that employees can implement a new system by working on this implementation part time, while continuing to perform all their regular duties. The time requirements needed to manage a project are often severely underestimated. Although, in smaller organizations, individuals may need to continue with their regular duties, all efforts should be made to have at least some team members dedicated full time to the project. If team members are not fully dedicated, their regular responsibilities will almost always take priority over the project, causing delays and lack of focus.

Communication

Effective communication can make the difference between success and failure of an HRIS implementation project. Leaders who overlook the importance of communicating a consistent change message and vision fuel some of the negative responses (resistance) encountered in managing change (Armenakis & Harris, 2002). No matter what kind of change initiative an organization's leadership may desire, it will not be successful without the support and commitment of a majority of its managers and employees.

Getting employees "unstuck"—that is, getting them to not only embrace the vision but also change their beliefs and thinking to move in the new direction—is a huge communication challenge. Communication can be an effective tool in helping to unfreeze and predispose employees to change (Eccles, 1994). Furthermore, as Duck (2001) reminds us,

> If leaders want to change the thinking and actions of others, they must be transparent about their own. If people within the organization don't understand the new thinking or don't agree with it, they will not change their beliefs or make decisions that are aligned with what is desired. (p. 28)

For example, the catalog retailer Lillian Vernon encountered huge problems with its IT transformation project when change leaders failed to effectively communicate why the project was necessary and how it would affect each employee specifically. The CIO noted that, instead of focusing on generalized statements about the system making jobs better, “we should have put everyone in a room and said, here is how you fit into this new picture” (Paul, 2004, p. 84). Ultimately, employees didn’t know how their jobs had changed and blamed the new system for all the problems.

It is vital that HRIS change leaders develop a communication plan to build awareness and enable understanding throughout the development and implementation process. Having a plan helps mitigate potential barriers by meeting the following objectives (Austin, Adkins, Fox, & Mency, 2010):

- Building awareness and mindshare of the HRIS project, its benefits, importance, and priority
- Creating interest in, and energy around, participating in the transition to the new HRIS
- Creating confidence that the HRIS project will be marked by open communication and knowledge
- Sustaining interest in the HRIS project throughout the many phases of the project
- Delivering updates on the progress of the project so that employees can contribute to the success of the project and be recognized for it

Despite the importance of communication, there are a number of barriers to effective communication (Figure 6.5). At their core, these reasons can be summarized as either assuming someone else will take care of communication or that the timing isn’t right. As the CIO of Lillian Vernon says, effective communication is characterized by “a few well-placed, well-delivered conversations to the right audience. And then you follow up, again and again” (Paul, 2004, p. 86).

It is clear that communication is critical to the successful information of a new HRIS. But what should be communicated? Mercer Delta Consulting (2000) suggests that five key elements should be communicated to employees:

Reason for the change: Answers the question "Why change?" and creates motivation for change. Simply saying that one's job will be better is not sufficient. Employees need to know the business case for the change and how change affects the bottom line.
Vision of the future: Serves as a starting point and anchor for what we do; answers the question "Change to what?" by providing leadership's vision of the new organization; and creates energy and excitement about the future. We address this factor more deeply later in the chapter.

Figure 6.5 Common Reasons Change Leaders Don't Communicate

1. ***They don't need to know yet. We'll tell them when the time comes. It'll just upset them now.*** For every week of upset that you avoid by hiding the truth, you gain a month of bitterness and mistrust. Besides, the grapevine already has the news, so don't imagine that your information is a secret.
2. ***They already know. We announced it. OK, you told them, but it didn't sink in.*** Threatening information is absorbed remarkably slowly. Say it again. And find different ways to say it and different media (large meetings, one-on-ones, memos, a story in the company paper) to say it.
3. ***I told the supervisors. It's their job to tell the rank and file.*** The supervisors are likely to be in transition themselves, and they may not even sufficiently understand the information to convey it accurately. Maybe they're still in denial. Information is poor, so they may not want to share it yet. Don't assume that information trickles down through the organizational strata reliably or in a timely fashion.
4. ***We don't know the details ourselves, so there's no point in saying anything until everything has been decided.*** In the meantime, people can get more and more frightened and resentful. Much better to say what you do know, say that you don't know more, and tell what kind of schedule exists.

Plan for getting there: Answers the question "How are we going to change?" and mobilizes people in a common direction. Here, we want to provide the big picture—the agenda, key strategies, and implementation plans.
Believe change is achievable: Answers the question "Is this really possible?" and encourages interest, engagement, and optimism.
Expectations: Answers the question "What can I expect of you and what is expected of me?" and helps people prepare for the change while reducing their uncertainty.

In sum, communication plays a vital role in the success of change programs. It is difficult to engage everyone based on communication alone, however. Ideally, people must participate in the process from beginning to end. If the

sentiment is that the change is imposed from the top, then gaining commitment will be tough.

Training

Ongoing, effective training is essential in any change management initiative, particularly when new technology and work processes are involved. Successful companies typically offer training in the early stages of the project to reduce uncertainty about the new technology and to generate increased user acceptance (Ruta, 2005, p. 38). Training is also used in the final stage of "refreezing" because employees obtain a better idea of how to handle the changes. A targeted training plan is one of several change management components that need to be developed as part of any HRIS implementation project. The training plan identifies the key elements and steps necessary for training the various staff on the use of the functionality and different components of the HRIS. The plan should include a post-assessment tool to measure users' knowledge following the training. A key design feature of the training curriculum will be to ensure employees using the system feel that the learning is valuable to them. Otherwise, the training may not achieve the desired outcomes. The use of training during the technology implementation can impact the "transition" and "refreezing" stages. At the beginning of the project, a training plan should be developed. This plan should include a complete assessment of the current skills and future requirements for all who will be affected by the change. The plan must also include the following:

- What training will be provided
- When training will be provided for implementation team members and user groups
- Who will provide the training (e.g., vendors, consultants, staff, or others)
- A plan for training new users and addressing turnover issues
- A plan for ongoing training, including advanced skills and refresher training
- A plan for training users in the event of system upgrades or procedural changes
- The resources needed—financial and human—to provide the training

We will discuss more about training and its importance in the implementation of the new system later in the chapter.

HRIS Implementation

As noted in Chapter 4, the implementation phase of the system development life cycle (SDLC) is where the new system is implemented and goes live. This is also the point in the change management process where new behaviors that fit with the new HRIS must begin to become institutionalized. To most employees who use the system, implementation is the day that they begin to use the system. But implementation actually has a number of important activities that must be completed before the system goes live. In this section, we focus on four specific tasks of particular importance: data migration, software testing, system conversion, and user training.

Data Migration

Data migration (or conversion) involves identifying which data should be migrated, how much historical data should be included in the new system, and the actual process of moving the data from the old system to the new. Decisions must be made in regard to how far back to convert data and how to convert the data from the older system data structures to the new system's data structures. Organizations will also need to determine when and how to convert the data, the time needed to allocate for data conversion, and any implications for data conversion on system downtime.

Software Testing

Another important task to be completed during implementation is software testing. The goal of **software testing** is to verify that the new or upgraded HRIS meets the requirements outlined during analysis and design, and to ensure that it does so with as few errors or bugs in the program as possible. Consider an example from payroll. The testing team may work with the HR staff to ensure that the payroll module functions function properly, that it avoids double payments or missing payments, and makes sure that checks

print.

System Conversion

The third task we will briefly discuss is system conversion. **System conversion** focuses on how the new or upgraded HRIS will be introduced, or implemented within the organization. There are four conversion approaches organizations can utilize. In a *direct conversion* the old HRIS or nontechnical processes are turned off and the new one is turned on. This is the quickest and often the least expensive implementation approach. At the same time, this is the most risky approach. Regardless of training and the change management process, there is an organization-wide learning curve while the users adjust to the new software. In addition, there is no other option if the system has errors or delays. A classic example of the problem with the direct conversion was Hershey Foods' $112 million inventory control and tracking system. A troubled implementation and conversion led to an inability to deliver $100 million of inventory to stores during the Halloween sales season (Koch, 2002).

In a *parallel conversion*, the new software is turned on for a period of time before the old software is turned off. The time period in question is usually a meaningful business cycle (e.g., a month or a quarter). During this time, both software systems are functioning, receiving input, running reports, and being queried. The positive of a parallel conversion is that there is enormous testing that goes on before the old software disappears. The negatives are that there will have to be dual data entry performed for every task, and there is a risk that employees will try to use the old system processes rather than fully committing to the new system.

In a *pilot conversion*, the new system is implemented in a single, pilot location. In large organizations with business units positioned across geographic locations, it may be necessary to use multiple locations as pilot locations during the conversion. The advantages of a piloted approach are that a representative location (or locations) can be selected to test out the new system while minimizing risk. Any needed adjustments can be made to the system before going live across the entire organization.

In a *phased conversion*, the system is brought on line through a series of functional components. For example, the organization may wish to turn on the core HRIS first and then bring on recruitment and learning management later. Nestlé USA, the California-based food company, opted for a gradual, phased-in implementation rather than going live all at once. The company started by implementing a new payroll system—first to a small group of 600 employees, then to other business units over time.

> By focusing on a small group first, we were able to address many of our interface and reporting needs upfront with a small population of employees. . . . Demonstrating successes and celebrating them along the way reinforced senior management's decision to fund the project, and motivated our team to keep going. (Henson, 1996, p. 5)

Documentation

Ask any developer, engineer, or architect what is the best time to begin documentation, and they will tell you that documenting processes should begin at the beginning of the project. In fact, the documentation requirements in the SDLC means that work completed in one phase will be documented to support future phases. But the challenge is that documentation is time-consuming and is often the last task to be completed, leaving a large amount of documentation work to be completed during implementation.

Most systems, whether developed, purchased, or accessed over the cloud will have two types of documentation: system documentation and user documentation. System documentation is a record of the design specifications and program code of the HRIS as built. This documentation is important for the system designers and IT staff who maintain the software, because it helps them better understand how to work with the code and the system itself. As the specific design and coding of an HRIS is beyond the scope of this book, we turn to a more relevant form of documentation, user documentation.

User documentation is the documentation that contains the instructions about how the user can interact with and use the HRIS. Although early documentation was paper based and often stored in a series of volumes in a

physical documentation library, today's documentation is mostly online, and available to a user as they need it. There are typically three types of documentation available to end users:

1. *Context-Specific Reference Documentation:* This form of documentation is focused on helping the end user solve a specific problem or complete a specific task. For example, documentation could provide advice or guidance on how to determine the number of withholdings to claim, or could help walk a hiring manager through how to select the appropriate job band or class. As such this form of documentation should be short and focused.
2. *Manuals:* Manuals provide a guide that walks end users through completing more complex HR tasks such as reviewing and assessing applicants and rank or conducting and documenting a performance review. Manuals will be longer than reference documentation.
3. *Tutorials:* Tutorials are the longest form of documentation and are focused on how to use the major system components. For example, tutorials could focus on the basic operations of the core HR system, the management of the recruitment process, or completing and submitting required government reports.

Training

Given the simplicity of apps on our smartphones, HRIS vendors continue to improve the functionality, simplify usability, and enhance the user experience on their systems. The goal is to make these systems as easy to use as the apps on our phone. The challenge is that HR is a very complex and regulated environment, with shifting laws and regulations. Therefore, even the most user-friendly systems will require some form of training. Most vendors of new software will provide training on the new system, and the cost will depend upon the level of training needed for the users.

As noted earlier in the chapter, to determine the amount and type of training needed for users, the organization should complete an analysis of the training needs and follow the recommended phases for effective training (Wexley & Latham, 2002). This should be done in conjunction with your organization's training professionals. It is important that the training time and cost be

included in the project plan, because training has been shown to improve implementation outcomes and user performance (Johnson & Marakas, 2000; Sabherwal, Jeyaraj, & Chowa, 2006).

Although some training early in the process is recommended, full training should not be offered until just before the system will be used. One common error is providing too detailed training too early in the learning process. If training is provided too early, users will not retain the material. An employee may learn how to perform 10 new tasks on the system, but may only encounter five in a normal workday, three over the next year, and two in exceptional circumstances. Therefore, by the time, the employee has to complete the task in question, the training will have been forgotten. Given this, organizations have found that an effective way of training end-users is through a combination of on-the-job training and self-paced e-learning, providing personalized assistance as required (Dawson & Jones, 2003).

Involving "**power users**," those employees who use the system heavily and who have obtained expertise, can also be an effective training technique. For example, a division of a global petroleum organization utilized a power user concept to diffuse system skills and training and found that as "power users shared their knowledge with other users, knowledge about how to use the system began to permeate the organization" (Jones & Price, 2004, p. 29).

Resistance to Change

At a basic level, when we ask employees to totally change the way they have been working, it can seem like we're asking a basketball team to switch to playing golf. People cannot change their behaviors overnight, "get smarter over the weekend, or 'grow' skills they do not have" (Williams, 2003). Lou Gerstner (2002), former CEO of IBM, aptly noted why employees resist change: "Nobody likes change. Whether you are a senior executive or an entry-level employee, change represents uncertainly and, potentially, pain" (p. 77). It is *natural* for individuals to resist change because they are comfortable with the status quo. One expert suggests that 20% of employees buy-in and tend to support and drive a change from the beginning, another 50% are fence-sitters and don't commit, and the remaining 30% tend to take a hard-core stand and oppose the change (Kirschner, 1997).

Another barrier is the tendency for many organizations to develop a comfort level based on their current performance, especially successful organizations. It is easy for successful organizations to become overconfident, complacent, and even a bit arrogant about their success. Managers can develop a myopic view of their company as the center of the competitive universe. It is much easier to hang onto what made you great than to change, which can be costly.

Further, if an organization accumulates a series of failed change initiatives, employees can become burned out and cynical about the change process. When this happens, it's hard to create a feeling of enthusiasm and zeal for the next change as employees can feel a sense of "initiative overload, change-related chaos, and employee anxiety, cynicism, and burnout" (Abrahamson, 2004, pp. 2–3). Before one change program can be brought to fruition and institutionalized, there comes another wave. Soon people become so overwhelmed that they lose track of which change initiative they are working on and why. Employees are no longer motivated to participate in the change, nor do they exhibit the level of commitment necessary for the change program to be a success.

The barriers and pitfalls to change notwithstanding, change leaders must find a way to move beyond the status quo to overcome employee resistance to change, and motivate employees to make the changes necessary to ensure the successful implementation of the new or upgraded HRIS. This can be made more difficult because every employee may have concerns that can lead him or her to act in a way that undermines the change effort (Baum, 2000).

Employees must understand both emotionally and intellectually why the new system is valuable. Employees' responses to change depend on their understanding of the changing work environment and new system. They want to know why the change is necessary and what the change will look like. Despite the fact that the new HRIS is being implemented to improve the efficiency and effectiveness of HR, fear and resistance to the new system from HR staff will be common and must be anticipated and addressed. HR employees may be concerned about job loss or the new roles, responsibilities, and uncertainty that will result from the change. Organizational employees may be concerned about how the new system may change the relationship between HR and the rest of the organization. Employees may feel that HR is

eliminating customer service to cut costs.

This resistance to a technology change can take many different forms. Employees can overtly resist the changes by refusing to make the change or use the new system. They can also overtly sabotage the new system or engage in a passive-aggressive fashion, where they outwardly support the system, while working behind the scenes to defeat the systems change (Marakas & Hornik, 1996). Despite the negative connotations of resistance to change, resistance can provide important feedback to change leaders.

1. Resistance can represent critical feedback about potential problems associated with the change. For example, those who are providing the resistance may possess vital details of problems that will arise if the change is made.
2. Those resisting the change often care passionately about the organization and this passion ignites the resistance. Change leaders may be able to work with these individuals to refine the change, harnessing their energy to redesign the portion of the plan that could have ultimately derailed the change.
3. Resistance can help narrow the focus and hone the change manager's ability to return to the original focus of the change and help hold them more accountable to the change initiative.
4. Resistance may serve as a conduit for increased communication, participation, and engagement. This increased engagement can potentially deliver greater acceptance and success for the change initiative.
5. Resistance can heighten the awareness of change and can raise its prominence in the organization, extending its life.

Critical to these five benefits of resistance is the importance of getting the users involved in the change process. **Employee participation and involvement** has a long history in the behavioral sciences, and information systems research has generally demonstrated that employee involvement is related to increases in job satisfaction, job performance, systems acceptance, and systems success (cf. Cotton, 1993; Harris & Weistroffer, 2009).

User Acceptance

Ultimately, use of the new HRIS and HR processes represents project success. Organizations cannot simply rely on the strategy of "if you build it, they will come." Change leaders must create **user acceptance—**otherwise, they risk failure as users choose not to utilize the new system. Research has shown that up to 70% of the functions of new HR systems go untapped because users make the new system do only what the old system did (Roberts, 1998). Several factors have been shown to affect user acceptance. These include the following:

- *Effort expectancy:* The expected effort it will take to use the system
- *Performance expectancy:* The extent to which an employee believes that the HRIS will enhance his or her job performance
- *Social influence (subjective norms):* The degree to which users perceive others in the organization to feel that the system is important. In other words, employees are more likely to accept the HRIS if they think doing so will help them fit in and conform to the behavior of others.
- *Facilitating conditions:* The extent to which employees believe that the organization is committed and resources are in place to support implementation and use of the system

To increase the likelihood of employee acceptance of the HRIS, it is important for end users to be involved with and feel ownership of the new system. Ideally, end users should be brought into the project as early as possible, even as early as defining system requirements. It is also important that users feel that their involvement is providing real value to the system change and that their ideas and opinions are recognized (Greenberg, Fauscette, & Fletcher, 2000). By helping shape the real requirements, users begin to take ownership and a personal stake in the system throughout the development process. The challenge facing organizations is how to involve users without expecting them to add additional hours to their already full schedule.

Informal ambassadors (e.g., gatekeepers) or professional change agents can help influence the rest of the organization and can make or break the acceptance of a new system. Implementation teams should identify influential individuals and those who have shown an interest in the new HRIS and engage them as informal ambassadors for the change. It is also a good idea to

identify the most resistant users and involve them right from the beginning to gain their buy-in (Keener & Fletcher, 2004). Otherwise, they may influence others negatively toward the change.

One of the major obstacles to gaining user acceptance is user reluctance to try out the new system. Some companies have used pilot implementation in one part of the organization to get early reactions and suggestions for modifications. Ensuring that employees use the system when it is not a requirement of their job is more challenging. Offering rewards to encourage user participation in new systems can be very effective. Some examples follow:

- The State of Kentucky offered those who completed an online survey providing feedback on the new system a chance to win a weekend stay at a Kentucky state park (Anheier & Doherty, 2001).
- One organization awarded gift certificates to the first 50 employees who used the system to update their personal information.
- One organization gave employees a $100 bonus for completing their annual benefits enrollment online.

A small investment in rewards such as these can result in increased user comfort and acceptance.

Critical Success Factors in HRIS Implementation

As you can see, the implementation of a new or upgraded HRIS requires effective change management. In addition, several other factors play a role in ensuring success. Several authors have identified and discussed some of these factors (Ceriello & Freeman, 1991; Rampton et al., 1999; Walker, 1982).

These lists of success factors and mistakes serve as both cautions and recommendations for a successful HRIS project. Some of these mistakes and success factors have been mentioned in previous chapters as well as earlier in this chapter. We briefly summarize them here:

1. *Top management support:* Simply stated, the project must have **top management support** at the beginning and throughout implementation

and evaluation. Top management (e.g., C-Suite members; department or unit heads) must be willing to provide the necessary resources and authority for project success.

2. *Adequate and timely resources:* These resources include not only financial resources, but also time and personnel. To successfully implement an HRIS, it is important that enough personnel can devote time to the project to ensure its success. More information on the financial aspects of system implementation, including how to conduct a cost-benefit analysis (CBA), is found in Chapter 7.
3. *Communication:* As noted above, everybody involved in and affected by the HRIS project needs to be informed regularly about the goals, progress or lack of it, issues, and challenges throughout the life of the project. This leaves less room for organizational politics, rumor mongering, and misapprehensions.
4. *Organizational culture:* As noted above, **organizational culture** can also affect the implementation of an HRIS. Contrast an organization in which change was dictated by management versus one in which there was extensive participation by employees in the change effort.
5. *User involvement:* As indicated in Chapters 3 and 4, user involvement is critical to the effective development and implementation of the HRIS. This ensures that the project is designed and implemented in accordance with user requirements and, therefore, will have a better chance of being accepted.
6. *Project champions:* It is important that your project has a ***project* champion**. A project champion is an individual or small group who have the authority and status to ensure appropriate resources are applied to the project. Because of the importance of this role, selection of these individuals must be done carefully, and the persons selected should enjoy a good reputation and status in the organization.
7. *Organizational structure:* Typically, the implementation of a new HRIS will require changes in reporting lines of authority as well as changing responsibilities for HR and IT. If the departments are not used to cooperation and collaboration, they will develop a "silo mentality" and will compete against each other to the detriment of the organization.
8. *Change management:* The assumption that employees will "love" the new system because of its sophisticated features is naive. Selecting a change management approach that fits the organization culture and

change needs will enhance the probability of success.

9. *Project control and monitoring:* Trying to execute an HRIS project without a written project plan will lead to failure. Likewise, the project team's failure to communicate project milestones and progress will negatively impact project success.
10. *Cross integration between business systems:* Poor integration between systems is usually the result of poor communication across functional departments during the development of the HRIS. Without effective communication, the HRIS will be unable to interface with other business systems, such as the financial, operations, or marketing systems. When implementing a new system, do not underestimate the value of understanding of what data from the system can be used by other systems, or where data from other systems may need to be transferred into the HRIS.

Summary

The aim of this chapter is to deepen your understanding of change management, the implementation process, and the behaviors and organizational factors required for success. To help illuminate the challenges in this effort, this chapter defines change management and the important role effective change management plays in the implementation of any HRIS. The chapter introduces several change models and explains why these are important concepts for today's HR leaders.

The evidence is clear that successfully introducing a major HRIS into an organization requires an effective blend of good technical and good organizational skills. Effective management of change is a critical core competence that management and HR leaders must master. By better understanding the competencies needed to manage change, HR professionals can help in process of change in organizations.

The chapter also discusses the implementation phase of the SDLC, taking particular note of several key implementation activities and factors that affect the success of an information system. Not surprisingly, the majority of these factors are employee and organizational focused, rather than technically focused. Change leaders must prepare for the inevitable resistance to change and plan to gain user acceptance.

Key Terms

change agent 122
change management (CM) 121
data migration 136
employee participation and involvement 141
force-field analysis 124
gap analysis 122
Gleicher's change equation formula 127
Kotter's eight-stage change model 129
Lewin's three-step change model 124
maintenance 000
Nadler's congruence model 127
organizational culture 143
power users 139
project champion 143
psychological safety 126
reengineering 121
refreezing (third step in Lewin's change model) 127
resistance to change 122
scope creep 133
software testing 137
system conversion 137
top-management support 142
transition (second step in Lewin's change model) 126
unfreezing (first step in Lewin's change model) 125
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Discussion Questions

1. Discuss each of the theoretical change models introduced in this chapter. How can we use them when planning an HRIS implementation to increase our chances of success?
2. Analyze the main reasons for HRIS implementation failure. How can we prevent these from affecting us?
3. Discuss the importance of communication in managing a technology

change. What roadblocks might an organization face if it fails to create a good communication plan?

4. If you were asked to develop a training plan for an HRIS implementation, what kinds of things would you include? Why?
5. Discuss the role of culture in HRIS implementation. How might two different organizations with very different cultures approach the same HRIS implementation differently?
6. Create recommendations for an organization that is facing resistance to change from its own HR department. What are some of the likely causes of this resistance? How can they be overcome?
7. Discuss how informal leaders within the organization might be used to increase user acceptance.

Case Study: The Grant Corporation

The Grant Corporation is a financial services firm based in Chicago, Illinois. Its revenue exceeded $1 billion last year, producing a net income of $530 million. It has just over 1,000 employees. Although the organization has been in business for almost 10 years, it has experienced rapid expansion in the past two years due to tremendous business growth and a merger with the Enelrad Group, another local firm. Managers have had difficulty keeping up with this growth, especially in the HR department, which has been stretched thin to keep up with staffing needs and other, mainly administrative, duties.

Six months ago, the CEO, Todd Jackson, recognized the need to expand the size and functionality of the HR department and hired Julia Woodland to be its director, reporting directly to him. This was a newly created position, and its incumbent would replace the HR administrator, who had previously reported to the VP of Finance and who decided to retire when the new HR position was announced.

When Woodland was hired, Jackson told her that she would have “full reign” to create a more strategically focused HR department that would be better equipped to handle the organization’s needs. She had quite a bit of experience at her previous company and was eager to take on the task.

Although the organization used advanced technology for its business

applications, HR was still using a basic payroll processing software program and Excel spreadsheets to track various categories of employee information, including personal data, benefits enrollments, performance evaluation schedules, and compensation. All payroll and benefit information was manually entered into these respective systems, and much of the information had to be entered into multiple spreadsheets when there was a change. The department could not keep up with the information needs—new hires were getting paid incorrectly, or not at all. Benefits enrollments were delayed or contained mistakes, and performance evaluations and pay raises were late. The printed employee handbook, benefits binder, and orientation materials were in serious need of updating. In addition, the company had 16 open positions and stacks of resumes everywhere. It was no wonder that the HR administrator had decided to retire!

Julia Woodland spent long hours trying to determine what she could do to address the immediate and long-term concerns of her new department. She brought in a temporary employee to help her staff file, process paperwork, and enter data. She focused on hiring two higher-level HR representatives and a payroll clerk. She turned to a staffing agency to help the firm identify candidates for open positions, including those in HR. Finally, she proposed the purchase of an integrated payroll/HRIS that was capable of integrating with the finance department's system as well as with the organization's benefit and 401(k) providers' systems. The proposed software solution also offered the option of a Web-based employee portal, which would allow employees to view information online and change their personal data. Jackson responded favorably and told her to "go ahead and do whatever she needed to do to fix the mess." The next day, Woodland contracted with the HRIS provider.

Woodland spent the next week meeting with her new HRIS vendor representative to discuss the installation and implementation of the system. Because she was so overwhelmed and wanted to get the new system in as quickly as possible, she didn't have time to discuss the project with her staff right away, but she knew that employees would be excited about the new system and the opportunities it would open up for them as the burden of administrative tasks eased. She closed her door during the meetings, so participants could concentrate. She wanted to be able to implement the

system by January 1, so that the company's year-end payroll data were accurate and managers could track other data on an annual basis with a full year of data. Since she had been through the process in the past and was familiar with such systems, she figured that she could manage the implementation with the help of IT and her staff as needed. She would make all key decisions to move the project along and meet her deadline.

The current HR staff consisted of an HR assistant and two generalists who seemed to function as clerks and recruiters. They had all been hired at the same time more than five years ago, when the HR administrator was the sole member of the department. They were very proud of how they had worked so hard together to build HR and keep up with the increasing demand. They were just getting used to working with Woodland but thought that she was very nice and had high hopes for the improvements and new strategic focus that she would help them implement.

Day by day, the staff watched the vendor representative come and go, along with a parade of candidates sent over by the staffing agency to apply for the new HR positions. They soon began to wonder about all the changes that their new boss was making and what these changes would mean for them. They started making assumptions that had them very concerned.

Woodland contacted the IT director to tell him about the project. He expressed concern over the ability of the server to handle the new system and wondered how they would address firewall issues with the portal. Furthermore, all his staff members were tied up with a critical upgrade to the customer service system, which had caused more than its share of problems. He demanded to know why he and his staff had not been involved sooner and told her that it would be unlikely that they would be able to participate in the implementation or help her meet her deadline. Upset, she called Todd Jackson, who advised her not to worry about it—he would tell them to get it done.

When she contacted Finance to obtain information that the HRIS vendor needed to link the HRIS to that department's system, the finance manager was more than willing to help—but she did not know where to get the system information from and did not understand how the information would flow from one system to another. She asked why they couldn't just keep the

systems separate and enter the necessary data into the finance system from reports provided by HR. “That’s the way we’ve always done it,” she said. “It doesn’t take long, and it will be much simpler that way.”

In the meantime, morale was declining in HR. Whenever Woodland asked HR employees for information about payroll or their Excel spreadsheets, they seemed uneasy and never provided her with exactly what she was looking for. She didn’t understand their antiquated forms or their backward processes but decided she could fix those after the new system was in. Also, it felt like the rest of the company was suddenly treating her differently. They had all made her feel so welcome six months ago when she came on board. Now, employees approached her with caution, and managers always seemed abrupt.

Julia Woodland began to wonder if this was the right role for her. Why were things so difficult? She thought that everyone would be thrilled about the new system and its efficiencies and would be eager to help. Was it her problem or theirs?

She thought that perhaps people didn’t realize the impact she was making in the organization. She decided to make an announcement about the exciting new system that would help make things more effective and efficient in HR and help the employees simplify their lives as well. She sent out a company-wide e-mail announcing the new payroll/HRIS and outlining its ability to interface with other systems and its Web-portal capabilities. To her disappointment, no one seemed to understand the significance or even pay attention. A few employees asked her if their paychecks would be delayed as a result.

She wondered how she would ever get through this project and what she needed to do to get everyone on board.

Case Study Questions

1. Overall, what did Julia Woodland do right? What could she have done differently?
2. Were the correct people involved in the process? Whom would you have

included and why?

3. What errors did Woodland make with her own staff? What impact might these errors have had on the success of the implementation? What should have been done?
4. Discuss the cultural issues involved in this case. Are there things Julia Woodland should have taken into consideration prior to starting the implementation? Why are they important?
5. If you were in Julia Woodland's position, what would you include in your communication plan for the implementation?
6. How can training be used in this case to make the implementation more successful?
7. How can the Grant Corporation increase user acceptance of the system?
8. Discuss the potential benefits of process reengineering in this implementation. What impact might it have had?
9. After the implementation, what steps should the HR department take to ensure proper maintenance and support of the system?
10. What can Julia Woodland do now to "get everyone on board" and increase the likelihood that this implementation will be successful?

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7 Cost Justifying HRIS Investments

Kevin D. Carlson

Michael J. Kavanagh

Editors' Note

Central to the decision to develop and implement a new or improved HRIS will be the costs and benefits of the investment. Like most consumers, HR professionals and managers are frequently awed by the newest technologies supporting HR, or by entire HRIS, and make a purchase decision on the systems features. However, as discussed in this chapter, without a comprehensive cost-benefit analysis (CBA), such purchases may not yield the desired results. It is not simply enough to have sophisticated new software with "shiny new buttons"; the HRIS must add financial value to the firm. In other words, it must pay for itself. The CBA for an HRIS investment needs to be made prior to purchase, early in the system's development life cycle. In fact, a preliminary, estimated CBA of an HRIS investment should be presented to senior management before any detailed work on the new projects or system upgrades is begun. This preliminary estimate should assist senior management in deciding whether or not the HRIS project should continue. A more detailed analysis can then be made as part of the needs analysis. The information in this chapter provides guidance for making CBA estimates as well as practical advice on how to make the CBA palatable to managerial decision makers. Finally, there is an emphasis on the value of the CBA and its documentation for the management of the project and its implementation.

Chapter Objectives

After completing this chapter, you should be able to

- Explain why a CBA is critical for a successful HRIS project
- Explain the differences between cost reduction and organizational enhancement as strategies for HRIS investments
- Explain how using guidelines for approaches to investment analysis will lead to a better HRIS project
- Identify the various costs and benefits in a CBA of an HRIS investment
- Explain the differences between direct and indirect benefits and costs
- Describe how to estimate costs and benefits, both direct and indirect
- Explain the difference between average employee contribution (AEC) and variance estimates for estimating values in a CBA, and understand why the difference between these indices is important for investment analysis
- Define and describe utility analysis as being built by alternate CBAs for different outcomes
- Discuss three common problems that can occur in an HRIS CBA

HRIS In Action

An HRIS development and implementation project was being done by FarmforMore,[1] a U.S. manufacturer of farm machinery. FarmforMore has manufacturing operations in the major geographic regions of the United States, although a larger number of plants are situated in the Midwest. Its sales staff is also regionalized with sales offices in all major U.S. cities. FarmforMore currently has approximately 28,000 employees. The HRIS project was designed to have computer applications for 90% of the HR functionality, excluding payroll, which was outsourced to a vendor. The proposal emphasized the benefits of the new HRIS in terms of time saved for HR professionals as well as the timely reports designed for supervisors and managers. According to the project team, the costs, totaling $1.5 million, seemed reasonable considering the potential benefits.

[1] The company name is fictitious to protect the confidentiality of the actual

company.

The HRIS project began two years ago with a needs analysis and basic design, approval from the CEO, and the selection of the project team and steering committee. The project team was led by the vice president of HRM, and steering groups had representatives from all regions of the country as well as from all major departments—finance, IT, HR, production, marketing, and research and development. A cost-benefit analysis was done. The major costs in the proposal were software, implementation costs, and the salaries of the project team's members. However, the project team indicated that time saved by computer-based transactions was the main cost-reduction benefit, estimated to save 14.3 full-time equivalent (FTE) budget lines, which would easily cover the costs of the new HRIS.

About eight months ago, there was information in a project team interim report that indicated the HRIS project was behind schedule and had some minor cost overruns. There did not seem to be much concern at the time since, even though the project was behind schedule, the project team was certain that the delay was due to developing better working relationships among team members. Plus, it had taken more time to transfer the basic employee information from the old system to the new one.

Two weeks later, the CEO sent a memo to the project team leader, the VP of HRM, to meet with her to determine whether the HRIS project was back on schedule and the cost overruns had been resolved. Unfortunately, the HRM VP reported that the project was now running about nine months behind schedule and so would need more funding to complete its tasks. This delay meant that the costs of the project had increased by 147%. The HRM VP could not really explain what had happened since the project team felt it had done a careful cost-benefit analysis. When the CEO looked at the cost-benefit analysis, however, she stated that her college-age son could have done a better job. Since there had been a downturn in national sales as well as profits, the CEO put the HRIS project on "hold."

Introduction

Computers are useless—they can only give you answers.

—Pablo Picasso

In most organizations today, a human resource information system (HRIS) provides the primary infrastructure used to deliver human resources (HR) programs, ensure HR regulatory compliance, and produce the metrics that are used to evaluate not only the HR function but also the contribution of the organization's human resources to the accomplishment of firm-level strategic objectives. **HRIS functionality** continues to evolve and to expand—we no longer see the simple shifting of paper-and-pencil processes to their electronic equivalents, but rather new capabilities that leverage the advantages of integrated information systems that are faster and more capable computing technologies. As a result, organizations are faced with new opportunities to extend their investments in HRIS functionality. HRIS functionality refers to the number of programs or functions—such as recruiting, compensation, and job analysis—that are operational using the specific HRIS configuration, as well as to the features of these programs that enhance their usability and capacity to affect outcomes. Thus, HRIS functionality could include all HR programs in a fully integrated system or only a number of the more important programs, for example, compensation and benefits. HRIS functionality typically varies with organization size, with larger companies having a greater number of programs or functions in their HRIS configurations than smaller companies.

However, as discussed in Chapter 14, statistics measuring the success of HRIS projects are not very encouraging. The failures of the implementation of systems have been well documented (Browne & Rogich, 2001). Delays in projects and budget overruns as well as user dissatisfaction are some of the most common reasons for the failure of HRIS projects. Systems that are completed generally exceed cost estimates by more than 55% and time estimates by a factor of 2. In addition, only 13% of the systems projects that are completed are considered successful by the executives who sponsor them (Lemon, Bowitz, Burn, & Hackney, 2002). Further, there have been significant failure rates for the implementation of HRIS in major corporations that indicate HRIS projects need better planning and cost estimates (Bondarouk & Meijerink, 2010; Dery, Hall, & Wiblen, 2010; Dulebohn,

2010; Grant, Newell, & Kavanagh, 2010; Tansley, 2010). Many of these failures occurred because a **cost-benefit analysis (CBA)** was not done as part of the business case for the justification of the HRIS project. Historically, HRIS were justified because of their primary benefit of improving employee transactions, plus their potential to save HR time.

In the 1990s, CBA played only a limited role in HRIS investment decisions. The pending obsolescence of noncompliant systems in Y2K (Year 2000) fueled widespread implementation of new HRIS technology. The result was one of the most concentrated and dramatic shifts in HR practice ever. During this period, purchase decisions were driven by two primary criteria: Did new systems offer the baseline functionality required by the organization in a Y2K-compliant form, and could the systems be delivered and implemented on time? It was apparent that something had to be done to meet the potential problems of Y2K, and more fine-grained investment analyses would not have affected purchase decisions. Thus, many organizations chose not to invest the time and effort to complete an investment analysis. However, the business landscape has changed today. Many decision makers, some of whom are still waiting to see returns from past information technology (IT) purchases in terms of successes and failures, are wary of new HRIS investments. Without an event like Y2K driving change, justifying new investments in HRIS will require strong business cases, that is, CBAs.

Justification Strategies for HRIS Investments

Strategies for justifying HRIS investments fall into two categories—*risk avoidance* and *organizational enhancement.* A risk avoidance strategy is used when investments are believed to eliminate or mitigate significant future risks faced by the organization, for example, generating reports of the gender and racial diversity of employees. The potential obsolescence of **legacy computing systems** was a prototypical risk avoidance scenario. The old system simply needed to be changed to avoid Y2K problems and also because it was out of date. The need to comply with laws and regulations (e.g., the Equal Employment Opportunity Act) and changes to these laws provide other circumstances in which justification based on risk avoidance is popular. Risk avoidance justifications focus on the magnitude and probability of risks and often are not supported by the extensive investment analyses

required by a CBA.

Organizational enhancement strategies, on the other hand, highlight how the effectiveness of the firm will be improved by the addition of a new or improved HRIS—as measured by increases in revenues or reductions in costs such as voluntary employee turnover. Organizational enhancement justifications are often more challenging to "sell" to decision makers than risk avoidance ones because enhancements do not carry the threat of real loss if no action is taken. Hence, there is often a reduced sense of urgency. This situation is supported by research on decision making under risk that consistently demonstrates that, when faced with potential losses, decision makers are willing to accept much greater risk; in other words, they become more risk seeking and willing to make investments to avoid losses than when investment alternatives are framed as gains (Kahneman & Tversky, 1979). Investments justified by organizational enhancements typically require more rigorous support and are subjected to more intense scrutiny by decision makers.

Evolution of HRIS Justification

Several factors suggest that the next generation of HRIS functionality will be more difficult to justify. In the last two decades much of the "low-hanging cost reduction fruit" has already been picked. HRIS implementations have shifted many organizations from administratively intense paper-and-pencil HR processes to electronic transaction processing supported by integrated computer systems. Employee and applicant self-service, online recruitment, electronic payroll processing, and work flow software have dramatically reduced transaction costs. Employee self-service alone is reported to reduce the cost of many HR transactions by 50% or more. The next wave of HRIS functionality is unlikely to generate comparable reductions in costs, making investment decisions based on further cost reductions more difficult to justify.

Of course, there are still small and medium-size organizations that use paper-and-pencil systems or HRIS legacy systems that need to be updated. For many of these organizations, the value of reducing transactions costs will still serve as legitimate justification for adopting or upgrading an HRIS. In

addition, these firms may also use a risk avoidance approach to justify the new HRIS—for example, the need for accurate and timely employee records in litigation. However, as will be argued in this chapter, the use of an organizational enhancement approach, which incorporates a combined revenue enhancement and cost-reduction strategy, may provide a powerful means of determining the CBA for investment in a new HRIS.

It is therefore less certain that organizations with an operational HRIS will continue to pursue investments in new HRIS functionality aggressively. In fact, underinvestment in HRIS—that is, failing to approve many worthwhile investments—is likely. This underinvestment will not occur because the benefits of new investments in HRIS functionality are too small—in absolute terms, they are still substantial.

The underinvestment in HR functionality is more likely to result from the use of outdated CBA methodologies that emphasize cost reduction and do not adequately recognize the value of organizational enhancements attributable to important new HRIS functionality. HRIS managers will need tools so they can identify the sources of value to the organization that will result from HRIS investments. The field is maturing, and investment analysis tools must mature with it. This chapter examines HRIS cost-benefit dynamics and provides tools and techniques that can be used to conduct and evaluate HRIS CBAs that incorporate organizational enhancement.

Approaches to Investment Analyses Make a Difference: Some Guidelines

As discussed previously, one *must* conduct a CBA, frequently referred to as "making the business case" (Mayberry, 2008), for the acquisition of a new or improved HRIS. Usually, there is an HR or HRIS professional with selected team members who form the HRIS project team, as described in Chapters 3 and 6. This project team, or usually a subset of it, conducts the analyses and can be referred to as the CBA team. The members of this team include senior professionals from the HR and IT departments as well as representatives from other departments who will be affected by the HRIS project. The CBA is one of the first steps in seeking initial approval from senior management for an

HRIS project. It is important to recognize that a proper perspective has as much to do with conducting an effective HRIS investment analysis as do the tools and techniques used. Understanding why the analysis is being conducted and understanding the expectations of what is going to be done with the results will influence the judgments made by both the CBA and the entire HRIS project team during the analysis, as well as increase the value of the results produced. It is important that the CBA team be representative of the project management team to ensure the complete involvement of all operational departments and maintain communications between the two teams. In addition, there are several considerations or guidelines that can help the CBA team approach the analysis with an improved likelihood of making the best decision for the organization. These guidelines are contained in Table 7.1. We will briefly cover each of these **CBA guidelines.**

The objective for conducting a CBA is to improve organizational effectiveness. The primary purpose of each analysis is to make the best decision for the organization. In some instances, the best decision may be not to proceed with an investment. Making an investment should never be the ultimate objective. The desired outcome is to become a more effective organization, not simply *to justify a purchase.*

Be honest with yourself. The CBA team should enter each analysis with an open mind—not with a solution to justify. It is best to think of the analysis as an investigation devoid of any personal biases. The team needs to come into the decision process without preconceived notions, willing to approach the analysis objectively and willing to accept whatever results the analysis produces. If members of the team have a vested interest in a particular solution, for example, cloud computing or employee self-service portals, biases that influence the analyst toward supporting the desired result can unintentionally be introduced into the analysis. CBA techniques can be used to identify investment opportunities and important contingencies that can influence the success of eventual implementation. Developing a reputation as an impartial evaluator will increase management decision makers' confidence in analyses done by the CBA team.

Focus on key functionality rather than on specific hardware or software solutions. Many proposals for a new HRIS have erroneously started by

identifying a new software application and then trying to justify how its features and capabilities could benefit the organization. However, it is whether your organization performs more effectively after an HRIS implementation that will determine the success of any HRIS investment. The CBA team must focus on the organization and its process and outcomes (i.e., reduced costs or increased revenues), identify opportunities in order to improve effectiveness, and only then look to identify software solutions that provide the desired capabilities. Centering the analysis on a specific software solution shifts the focus of the analysis to the capabilities that solution offers, not necessarily the capabilities that are most needed by the organization. Therefore, the question to be answered is not just whether the system will increase HR functionality but whether the new HRIS will improve organizational effectiveness and fit with the business strategy of the firm.

Examine benefits before you examine costs. This is often difficult to do, but training the CBA team to examine the benefits of a change in HRIS functionality before estimating costs will produce better analyses. Knowing before you conduct the analysis of benefits how much would need to be spent to acquire new functionality can easily lead to an inaccurate CBA. This "backward" approach makes it almost impossible not to consider what level of benefits will be necessary to justify the investment. This approach can cause the team to abort prematurely the process of identifying and analyzing benefits, especially if a single source of benefits appears to be sufficient to guarantee adoption of the HRIS project. It can also encourage "fishing" for questionable benefits when the initially identified benefits may not be enough to justify the HRIS investment.

Know your business. As stated in Table 7.1, this means really understanding the organization's business and how the current processes in all departments allow the organization to accomplish its objectives. Furthermore, it means that the CBA team must understand the dynamics of the current business processes and where potential for improvement exists. Since the CBA team consists of senior representatives from all staff departments affected by the HRIS project, this business knowledge should exist within the team. Obviously, then, the CBA team must have cooperative relationships among its members. Further, it is important that the CBA and project management (PM) teams understand the internal politics of the firm.

Develop the best estimate possible. Various methods to achieve this goal are discussed in this chapter. It is also critically important, as mentioned in the previous paragraph, that cooperative relationships exist among members of the CBA team as well as within the PM team. The project team leader must try to reduce or eliminate interdepartmental politics, particularly between the HR and IT departments. Finally, note the advice in Table 7.1 not to be overly optimistic or conservative, but to develop the best estimate possible with the available data.

Distinguish between the analysis and the packaging of that analysis for decision makers. The primary purpose of analyzing an HRIS investment is to determine whether and to what extent it will improve your organization. The objective of the analysis should be to provide the best possible estimate of the impact of an HRIS investment. Developing the estimate should be seen as separate and distinct from the process of presenting and "selling" the investment opportunity to management decision makers. Decision makers may choose to rely on specific forms of benefit evidence or to adopt conservative assumptions in order to gain approval for the investment. Inappropriate investment decisions may result if overly conservative assumptions in the HRIS investment analysis conducted by the CBA team are compounded by the conservative bias common among decision makers.

TABLE 7.1 ■ Guidelines for Successful HRIS Cost-Benefit Analysis (CBA)

Key	Description
The objective is improving organizational effectiveness.	The objective of any HRIS CBA is not to purchase specific hardware or software. The objective is to improve organizational performance.
Be honest with yourself.	Start each analysis with an open mind, not an investment to justify.
Focus on functionality, not products.	The analysis should focus on the improvement in organizational functionality that is to be achieved. Start with that functionality, and let it lead to the product. Don't start with the product and attempt to identify ways to justify its purchase.
Estimate benefits first.	Examine costs only after you have completed the analysis of benefits.
Know your business.	This means really understanding what your business is and how your current processes allow your organization to accomplish its objectives. Understand the dynamics of your current processes and where potential for improvement can be found. Understand organizational politics.
Develop the best estimate possible.	Don't be overly optimistic or conservative. Develop the best estimate you can with the data available to you. This is the core of making the business case.
Separate the development of CBA estimates from questions of how best to package the analysis to justify a final decision.	The questions involved in developing an accurate CBA and attempting to determine how best to justify a choice to organizational decision makers are two separate processes. The latter involves choices about which sources of value should be included in the business case to be presented to decision makers. These are determined by the relative comparisons of costs with the magnitudes and types of revenue sources. Decisions about how to package the analysis for decision makers should be pursued only after a thorough analysis based on best estimates of all benefits and costs has been accomplished.

Source: IHRIM Journal, Vol. 8, Issue 1.

Source: IHRIM Journal, Vol. 8, Issue 1.

HRIS Cost-Benefit Analysis

A CBA is simply what its name indicates—a comparison of the projected costs and benefits associated with an HRIS investment, which can be presented as a comparison of cost and benefit dollars or presented as a cost-benefit ratio. A cost-benefit ratio (CBR) can be expressed mathematically, with the benefits of the project as the numerator and the costs as the denominator. Therefore, values greater than one indicate a positive ratio. A cost is any new outlay of cash required for the initial purchase, implementation, or ongoing maintenance of the investment. A benefit is any financial gain resulting from the investment that occurs at any time during the investment's useful life. Benefits include both revenue enhancements and cost reductions.

At its core, the CBA is an analysis of change in the cost-benefit ratio—a comparison of current existing levels of outcomes and cost of processes with the new outcomes and costs that are projected to exist after the HRIS investment. This comparison means the cost-benefit ratio for the current state must be calculated first. Then the cost-benefit ratio is estimated for the projected HRIS. The *size of the gap between these two cost-benefit ratios* is what will have an effect on the decision to implement a new HRIS or new HR functionality. However, it is important to note that ratios ignore scale, so although increases in the ratio are sought, raw estimates of changes in costs and benefits will be needed to understand the investment's impact on the organization.

A common misconception is that conducting a meaningful CBA (and utility analysis) requires financial expertise. Knowing some financial basics, such as discounting, cost of capital, cash flow, return on investment (ROI), **payback period,** net present value, and **internal rate of return (IRR),** is useful but not required. Organizations differ in the specific financial measures they use to evaluate investments. Organizations may use ROI, IRR, payback period, or other measures alone or in combination. Therefore, it can be useful to seek out an internal adviser to help you package your analysis for the managerial decision-making process used in the organization. Typically, this internal adviser will be someone in the finance or accounting department. However, regardless of the specific financial measures used in the organization, the foundations of all investment analyses, including CBAs, are based on three basic pieces of information: (1) sources of costs and benefits, (2) an estimated dollar value for each cost and benefit item, and (3) the time when the organization will incur each cost and receive each benefit. Developing estimates of these values depend more on an understanding of the business than on financial expertise. The remainder of this chapter will cover how these three basic pieces of information are obtained and used in a CBA.

Identifying Sources of Value for Benefits and Costs

Investments in HRIS functionality differ from more traditional investments because HR is commonly perceived as a source of costs rather than a direct source of revenue (Cascio, 2000). Any impact that HR department activities have on revenues occurs *indirectly* through the effect of HR programs and

practices on other units of the organization. For example, a program focused on training retail employees to provide quality customer service is typically a cost ascribed to the HR department; however, its indirect effect of increased sales is classified as revenue for the operations department. Thus, the effects of many HR programs or practices are often described as “soft” or, more appropriately, indirect. As a result, managerial decision makers are justifiably concerned about using indirect benefits to justify spending “hard” dollars, particularly when considering large investments such as a new HRIS. Approving an investment only to find that the expected benefits never materialize is something all decision makers’ fear. In the absence of obvious risk avoidance justifications and significant reductions in costs from previous HRIS investments, developing expertise in identifying and valuing the direct and indirect benefits derived from HRIS investments is one of the critical challenges that HRIS managers face.

Failing to recognize important sources of costs or benefits is a common problem in HRIS CBA. The HRIS CBA matrix shown in Figure 7.1 can be used to help uncover all reasonable benefit and cost components in HRIS investment analyses. The HRIS CBA matrix consists of six cells.

The four upper cells represent sources of benefits (i.e., direct revenue enhancements, indirect revenue enhancements, direct cost reductions, and indirect cost reductions). The two cells of the bottom row capture costs of implementation (i.e., direct and indirect costs). A simple evaluation of each cell of the HRIS CBA matrix can ensure that important sources of benefits or costs are not overlooked.

Direct Benefits

The four “benefit” cells of the HRIS CBA matrix (Figure 7.1) represent the crossing of two dimensions. The first dimension is the type of benefit—revenue enhancements versus cost reductions. Organizations can enhance revenues by changing employees’ job performance. These changes could result in *new revenue* in terms of new sales due to more efficient procedures, for example, those instituted because of a better training program for new employees. Organizations can also reduce costs by changing the locations of HR functions to make them more effective. For example, an organization

with a new HRIS could decide to outsource programs (such as employee recruiting) to vendors. HRIS investments often involve both types of effects. HRIS investments can also permit the offering of new products and services that can increase revenues and enhance profit margins. Thinking about opportunities for cost reductions and revenue enhancements separately allows each to be explored more fully.

Figure 7.1 HRIS CBA Matrix

		Direct (Hard)	Indirect (Soft)
Benefits	Revenue enhancement	New revenue (new sales)	Improvement potential (better decision making)
	Cost reduction	Direct costs (canceled vendor contracts)	Potential costs (saved staff time)
Costs	New implementation costs	Out-of-pocket costs (software, service agreements)	Indirect costs (increased technical support needs)

Source: IHRIM Journal, Vol. 8, Issue 1.

Hard or direct outcomes generally refer to benefits (and costs) (a) that are very likely to occur and (b) whose values are easily estimated. Some examples of **direct benefits** can be seen in Table 7.2, which shows an example of a CBA for an e-learning investment. As can be seen, the organization is considering having e-learning modules created by an external vendor to replace in-house training programs. Direct revenue enhancements include the additional revenue the organization can earn by selling the e-learning modules. Direct cost reductions include expected reductions in the costs associated with delivering training programs, as seen in Table 7.2, for example, reduced travel expenses and reduced facilities costs.

Indirect Benefits

Soft or **indirect benefits**, on the other hand, are often less easily quantified

because their occurrence may be less certain or because their value is more difficult to establish. After the HRIS functionality is introduced, indirect revenue enhancements result from improvements in intermediate outcomes that could position the organization to be able to increase revenues. For example, in Table 7.2, e-learning training modules can be used to improve customer service, and potentially sales, by improving the skills of sales employees. Improving managerial leadership could also have an impact on the indirect benefits at the top of Table 7.2 by encouraging employee engagement in the activities that most directly influence organizational effectiveness. Thus, in this example, the intermediate outcomes are the effects of the e-learning training modules that then may lead to the revenue increases. As listed in Table 7.2, these are "Better customer service leading to increase in repeat sales" and "A more agile organization able to respond rapidly to market changes." The e-learning training modules may also affect revenue increase outcomes by, for example, improving the organization's capacity to attract and retain high-quality employees, achieving a reduction in turnover and absenteeism (see Table 7.2), improving employees' capacity to make decisions, or freeing up time for employees to engage in activities that more directly support the strategic objectives of the organization (see Figure 7.1). Indirect revenue enhancements occur through one or more intermediate outcomes that require some additional activity or condition exists before an increase in revenues is realized. For example, before managers can work on leadership responsibilities and activities that are directly related to strategic company goals, it may be necessary to restructure several departments and provide some in-service training.

TABLE 7.2 ■ Example of an e-Learning CBA Matrix

	Direct (Hard)	Indirect/Contingent (Soft)
Revenue enhancements	Conducting custom e-learning training module development for other organizations Sales of locally developed learning modules or programs	Better customer service leading to increase in repeat sales A more agile organization able to respond rapidly to market changes
Cost reductions	Reduced travel expenses Reduced facilities costs (e.g., for room and equipment rentals and refreshments) Reduced requirements for paper-based training materials and teaching aids Reduced expenses for instructor fees or salary and benefits costs (if internal) Reduced costs for replacement workers if trainees are required to be away from their work	Improved training effectiveness through customization and just-in-time delivery = faster learning curve, less lost productivity while waiting for training, and right amount and type of content More agility, able to disseminate new cost-reducing best practices more quickly Reduction in turnover (41% of employees will look for another job within 12 months due to poor training and education; with good training and education, this percentage drops to 12%) and in absenteeism Improved safety (fewer injuries, less lost time, fewer insurance claims, lower workers' compensation costs) Employee time saved
Costs of implementation	Installation support Software fee/license Software support Analyst/administrator Training administrator Courseware development Courseware purchase Bandwidth fees	Increased use of end-user help desk Courseware redevelopment Lost productivity during conversion to new system

Source: IHRIM Journal, Vol. 8, Issue 1.

Source: IHRIM Journal, Vol. 8, Issue 4.

Since these benefits are not reported in a dollar metric, current CBAs typically do not include these items in the numeric analysis, but will often address them in the narrative discussion supporting the investment. In the e-learning example, better customer service (i.e., service that can lead to increased customer retention and repeat sales) and a more agile organization (i.e., one that can retrain or retool its employees more quickly to respond to rapidly changing markets) are examples of indirect or contingent sources of revenues.

Indirect cost reductions involve those changes that are expected to lead to

reduced costs. If we reexamine Figure 7.1, these benefits would fall in box number 4, potential cost reductions through saved staff time, and would include (a) staff time saved that does not lead to reductions in payroll or employee headcount; (b) expected reductions in the amount of or requirements for technical support; (c) expected reductions in absenteeism and turnover; and (d) expected reductions in the time required to bring trainees up to the status of fully functioning employees.

In many instances, time-saving applications are incorrectly projected to result in reductions in employee headcount or FTEs—a direct savings in payroll expenses. More often, though, the deployment of new HRIS functionality results in a new structuring of work that enables the elimination of parts of jobs rather than whole jobs. As a result, the benefit is indirect—a saving of time that can be deployed in other activities rather than a direct saving of the costs of salary and benefits. In the e-learning example, enhancements in training effectiveness are expected to lead to faster learning curves and less time to proficiency. This benefit is expected to result in fewer errors and less rework. Reductions in turnover costs are also anticipated because better-trained employees are expected to have higher satisfaction and remain in their jobs longer. Lower turnover rates for valued employees would have a strong positive effect, allowing the firm to reduce the costs of hiring new employees (see Cascio, 2000). Furthermore, improved access to safety training is also expected to result in less time lost as a result of injuries and reduced insurance claims and workers' compensation costs.

Consequently, because the effects are indirect, analyses of indirect benefits can be challenging. But, in many instances, these indirect effects are the real source of benefits for new HRIS functionality. Being able to identify the indirect effects and understand how they are expected to affect costs and revenues is critical to understanding how to justify HRIS investments. An important advantage of understanding how and where indirect benefits are expected to occur is that it allows the organization to plan and manage HRIS implementations in ways that make it more likely for indirect benefits to actually occur. Because these benefits are often contingent on other events, knowing what those events are and managing them as a part of the implementation will likely result in greater organizational impact.

Implementation Costs

Once benefits have been estimated, the analysis can proceed to estimating the costs of implementation (Table 7.2). In contrast to estimating benefits, cost estimation is often easier to complete because cost data are often readily available and already offered in a dollar metric. In most cases, many sources of **implementation costs** will be direct. **Direct costs** will include but are not limited to (a) costs for the initial purchase and updates of software and any additional hardware and (b) ongoing costs for internal or external systems support. In the e-learning example (Table 7.2), direct costs include the purchase of any new software, hardware, and licenses required to implement the system as well as the cost of the expertise necessary to develop and manage training on this new HRIS.

Indirect costs comprise those areas of cost that cannot be known specifically up front but may arise in the process of implementing the system. These include the impact of the implementation on the organization, such as lost productivity while the organization completes implementation. This impact includes lost productivity for rank-and-file employees as well as for the HR staff involved in implementation. The e-learning example includes increased use of end-user help desks or other support functions, costs necessary to revamp existing courseware while the organization learns how to use the new system most effectively, and the lost productivity that will occur for any current employees who will be required to take on additional responsibilities associated with the adoption of the new system.

It is important to be thorough in attempting to identify all the sources of cost. If your analysis recognizes some benefit without incorporating an offsetting change in cost, you likely have missed a source of cost in your analysis. For example, organizations that projected significant reductions in employee headcounts due to converting paper-and-pencil transactions to electronic systems, as was erroneously done in the opening vignette, often failed to recognize the full additional costs that would be required in technical support, training on the new system, or transitioning large numbers of employees out of the organization.

Also, the total costs of implementation will depend on the current state of

information system development in the organization. The components of organizational information systems evolve at different speeds across organizations. Knowing the current level of technological evolution of the organization's total information architecture and systems is quite important. These components would include those that are operational within departments concerned with finance, operations, marketing, and information systems, as well as HR. Assessment of these departments' systems should include evaluations of (a) the current state of their computer hardware, software, data, and processes; (b) user sophistication and networking; and (c) telecommunications technology. New HRIS investments may affect all these information systems (IS) components. In any one of these areas, the greater the change required supporting the implementation of the new HR functionality, the more expensive the implementation will be. Total cost will be driven by (a) the scope or size of the HRIS implementation; (b) the amount of customization required; (c) the maturity of the HRIS functionality being considered—the less mature the functionality, the greater the costs of implementation and upgrades are likely to be; and (d) the experience levels of the implementers.

TABLE 7.3 ■ Different Approaches to Estimating Benefit Magnitude

Approach	Description	When to Use It	Advantages/Limitations
Direct estimation	Direct ("gut level") estimates of the relationship of the potential benefits to the estimated costs of engaging in an investment	Best when costs are not large Appropriate when attempting to gain compliance or mitigating extreme risks When substantial direct cost reduction or revenue enhancements exist	Quick and low cost to perform May not provide data that contain sufficient detail for use in monitoring implementation effectiveness or to perform follow-up analyses Highly dependent on the expertise of the decision maker
Benchmarking	Using benchmark data from other firms to estimate the potential benefits and costs that are likely to result from the purchase of HRIS functionality	Superior to direct estimation when costs are large When the organization either has limited experience or no data concerning the area of functionality	Allows the organization to develop more precise estimates than direct estimation based on the collective experience of other organizations Average estimates of outcomes may not generalize to the target organization
Internal assessment	Analysis based on specific internal assessments of actual costs and likely benefits (e.g., activity-based costing)	When costs are high and benefits are not obviously dramatically larger than costs When the organization has the assessment capabilities in place to gather the appropriate data	Provides the most precise estimates of the baseline costs and current performance of existing processes against which to compare potential improvements May increase both costs and time required to make decisions
Mix and match	Using combinations of these approaches	When different amounts or sources of information are available for different types of costs and benefits (e.g., most likely scenario)	Permits the organization to use the best methods available

Source: IHRIM Journal, Vol. 8, Issue 4.

Source: IHRIM Journal, Vol. 8, Issue 1.

Although early attempts at CBA often grossly underestimated or ignored significant sources of costs, the experiences of organizations over the past decade have provided insights that can be used to do a much better job of recognizing what cost items need to be included in cost analyses. Several sources for determining cost of implementation are available, including organizations that have previously implemented specific packages or functionality, vendors in the HRIS field, and implementation consultants.

Estimating the Value of Indirect Benefits

Most HRIS cost-benefit analyses will include some indirect benefits. One of the more difficult tasks in producing an HRIS CBA is estimating the value of these indirect benefits. The difficulty of converting indirect benefit estimates to a dollar metric has limited their role in HR technology investment decisions. To this point, it has not been uncommon for soft benefits to be relegated to the narrative supporting an investment analysis that is otherwise based solely on estimates of direct cost reductions. For good reason, many managers consider these indirect savings cautiously. That does not mean, though, that these benefits are any less important than direct benefits to the organization. In fact, as noted earlier, ignoring them in HRIS investment analysis could result in incorrect or misleading analyses. As a result, we need to adapt the general techniques used to analyze HR technology investments to meet these new requirements.

Estimating Indirect Benefit Magnitude

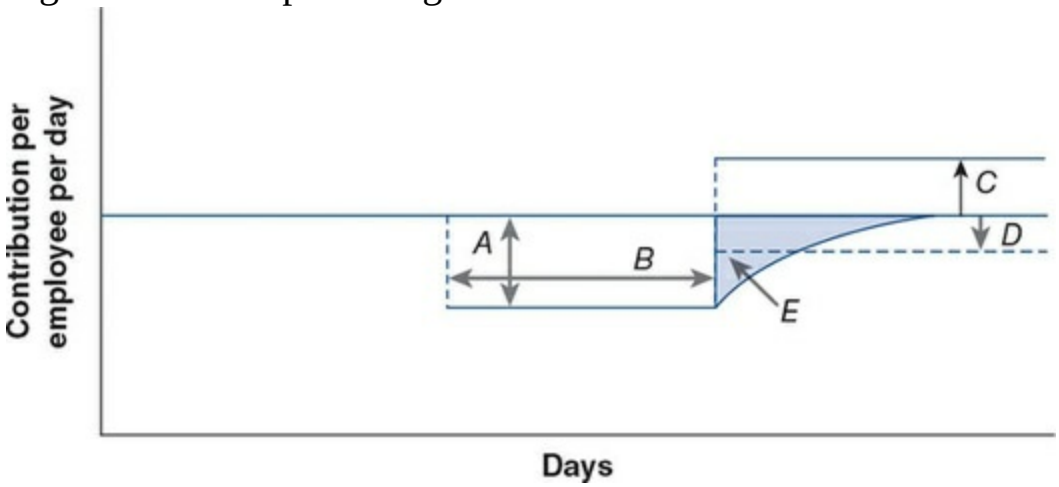
Constructing dollar estimates of indirect benefits is challenging, but it can be done. To simplify estimation of the dollar value of indirect benefits and provide a basis for justification, one should break this task into the following three steps: (1) estimating benefit magnitude, (2) mapping benefits to cost or revenue changes, and (3) converting magnitude estimates to dollar values. By separating these steps, we can begin to understand better the factors that influence the value of indirect benefits and, perhaps more important, when these benefits are likely to occur during the HRIS project. Also, since magnitude and value are often driven by different factors, separating these decisions provides a better framework for postimplementation evaluations. Both benefit and value estimates are then open to objective review.

An objective of HRIS CBA is to develop the best-possible estimates of the likely effect of the new HRIS functionality. Therefore, using a metric that is familiar or comfortable to those developing the estimate of this impact is likely to improve accuracy and, ultimately, make the project easier to manage. For instance, if the new functionality is predicted to reduce turnover (see Figure 7.2), the magnitude of the expected change in “turnover rates” would be estimated first. Then, the determination of the dollar value of the differences between the current rate and the expected rate is likely to produce better estimates than if decision makers attempted to estimate the dollar

impact of the expected reductions in turnover in a single step. The objective is to choose the metric and measurement procedure that will result in the most accurate estimate possible of the size of the benefit.

Once that metric has been chosen, there are three approaches for estimating **benefit magnitude**: (1) direct estimation, (2) benchmarking, and (3) internal assessment. Which method is the most appropriate depends on the amount of specific information that is available to the organization and the CBA team.

Figure 7.2 Conceptualizing the Effects of Turnover



Source: IHRIM Journal, Vol. 8, Issue 4.

Note: A is the average value (contribution) that is lost per day that a given position is left unfilled. B is the number of days that a position remains unfilled. C and D represent the increase or decrease in contribution that occurs if a new hire is more or less effective, respectively, than the employee who left. The gray area noted as E represents the loss of contribution that occurs during the time when a new employee is learning the job.

Direct Estimation

Direct estimation is the simplest of the three methods. It is quick and easy to

perform. It relies solely on the expertise of analysts or subject matter experts in the CBA team to estimate the expected magnitude of the benefit. **Direct estimation** is most appropriate when the scope of the project is small, compliance or risk avoidance is a primary investment justification, the component being estimated is not the primary component of costs or benefits in the analysis, or no other method for estimating benefit magnitude is available. The primary limitation of direct estimation is that the accuracy of the analysis depends on the expertise of the estimator.

When several equally qualified subject matter experts are available, collecting independent estimates from each expert and using the average of these estimates is recommended. In addition, it can be useful to require that experts articulate the rationale for their estimates. Requiring this step not only ensures that experts are thoughtful in the preparation of their estimates, but also provides the organization with an analysis of the assumptions or expectations contained in these rationales, which can be used to help improve the accuracy of future estimates.

Benchmarking

Benchmark data on the magnitude of indirect benefits achieved in other firms can be used. The advantage of **benchmarking** is that it allows an organization to build on the experiences of others. These data can provide evidence that a specific outcome can occur as well as evidence of its potential magnitude. Howes (2002) offers an insightful example of how benchmarking data can be used to estimate how much reduction in turnover an organization might expect. In this example, benchmark data about industry-wide levels of turnover are used to construct estimates of the potential for improvement in turnover that might be possible for a given organization. If an organization has high turnover relative to industry standards, it has the potential for greater improvement than might be expected for other firms in that industry.

Benchmarking information of various types is becoming more widely available from a number of sources (e.g., Deloitte, Gartner, Inc., The Hackett Group, PwC Saratoga Benchmarking, Society for Human Resource Management, and Harris Associates). Chapter 14 contains a reference to HR metrics that can be used in benchmarking (Society for Human Resource

Management [SHRM], 2010). Organizations can also conduct their own benchmarking studies to gather specific data from targeted firms, data that may not be readily available from third-party sources. Benchmarking is preferred over direct estimation for larger projects for which investment risks are greater. Benchmarking is also useful when organizations have limited experience with the targeted functionality of the HRIS project or when there is no access to local data. The primary disadvantage of benchmark data is that the experiences of other organizations may not completely generalize to your firm or business unit.

Internal Assessment

Internal assessment involves the use of a firm's own internal metrics (see Table 14.1) or other forms of the firm's specific data as the basis for estimates. Use of this method requires that the organization has maintained historic records on previous information system projects. Internal assessment is best done when investment scopes are large and direct estimation or benchmarking suggests that benefits may not be dramatically higher or lower than costs (e.g., less than ±30%). Internal assessment requires that the organization possesses the capability of gathering data about its own processes, as these data are necessary to support this kind of analysis. An advantage of integrated information systems—systems built on common platforms that permit single instances of data to be used in several applications and the seamless transfer of data between applications—is that the marginal costs of assessments are greatly reduced, permitting cost-effective assessments of a wide range of organizational outcomes. Internal assessments offer the most precise estimates of the costs and performance of existing or newly implemented processes. Internal assessments, though, may be able to provide only a portion of the needed data. That is, an organization may be able to gather accurate data about the outcomes of current processes, but, in order to complete the analysis, it may need to rely on benchmark data from other organizations or obtain direct estimates of the outcomes for new processes.

Even though possessing integrated information systems can reduce the marginal costs of assessments, conducting internal assessments and evaluating the data they produce are not costless activities. As described in

Table 7.3, internal assessment provides the most precise estimates of the baseline costs and current performance of existing processes against which to compare potential improvements. However, internal assessments will result in higher costs than direct estimation and, depending on the nature of the assessment, could result in higher decision-support costs than benchmarking. As noted, internal assessment is only possible when the organization has experience with a given form of functionality. It is not possible to assess the effects of new functionality that has not been previously implemented anywhere in the organization.

Each of these three approaches is recapped in Table 7.3. The ideal method for estimating the magnitudes of indirect benefits in most HRIS analyses is to use a combination of these three approaches. This permits each benefit to be estimated using the method that is most appropriate given the availability of data and the investment's cost, risk, and opportunity characteristics. For high-stakes investment decisions, using multiple methods to develop estimates can provide additional insight and increased confidence in the final decision.

Mapping Indirect Benefits to Revenues and Costs

In some instances, the metric of choice may not be one that is easily or unambiguously tied to reductions in costs or increases in revenues. That is, estimating the value of indirect benefits requires that the analyst first be able to articulate how the indirect benefit is linked to an actual reduction in costs or increase in revenues.

Then a Miracle Occurred!

The challenge of linking indirect benefits to revenues and costs is not a step that should be taken lightly. In many instances, it can be challenging to articulate exactly the change of events that leads from an investment to changes in the organization's bottom line. This can lead to causal language in investments that identify the initial links in the sequence, and then jump immediately to argue for the benefits to the organization. These analyses are of the form *A* causes *B* which causes *C* . . . then a miracle occurs . . . and the organization is more profitable. While articulating hypotheses about exactly how the causal change is expected to unfold can be difficult, doing so allows

the organization to plan more effectively for success—by adding new metrics at critical junctures to track progress and to identify potential contingencies that must be managed to ensure success.

To examine this idea further, let's assume that an indirect benefit of a proposed investment is reduced turnover, and we predict that implementing a new HRIS functionality will result in a reduction in voluntary turnover from 10% to 5% for a targeted group of jobs. Since the effect of turnover on costs and benefits is indirect, we need to understand how reducing turnover is expected to affect an organization's revenues or costs in order to translate our 5% reduction in turnover to other metrics that are more closely associated with changes in costs and revenues.

Employee turnover is a good example because it affects costs and revenues in several ways, some of which are depicted graphically in Figure 7.2. The departure of an employee can increase costs because it may require the organization to engage in a new recruitment and hiring cycle, and the new employee is likely to require training. But there are other effects as well. For instance, the loss of an employee in a position critical to the day-to-day functioning of the organization will require that efforts be made to cover the work responsibilities in that employee's absence. How an organization chooses to cover those responsibilities will influence the magnitude of the net loss of contribution that results from the vacancy. There will be salary savings for the vacant position, but the cost of temporary hires or of shifting other employees off their primary assignments, not to mention the opportunity costs that result from using less than fully effective temporary or overextended employees, also must be considered. The total loss added by this vacancy is represented in Figure 7.2 by the region $A * B$—the value of the daily loss of contribution multiplied by the number of days the position remains vacant. Also, as noted in Table 7.2, turnover affects the contribution the organization derives from a position. Perhaps the departing employee was a poor performer and replacing him or her will actually result in a net gain in average long-term effectiveness for that position (i.e., *C* in Figure 7.2). Even with training, new hires will most likely require some time on the job before they can become fully effective; their effectiveness will increase as they gain expertise. But, during this time, contribution will be less than would have been experienced had there been no turnover in the position (i.e., *E* in Figure

7.2). Each of these intermediate outcomes can be tied to a specific cost or revenue effect through one or more links.

In this example, a comprehensive estimate of the impact of the expected reduction in turnover is represented by the sum of the estimates of each of these components in Figure 7.2. In some cases, and for specific types of benefits, these relationships may seem quite complex. Do not be discouraged or dissuaded from being thorough. Understanding exactly how these changes are projected to affect the organization may yield important new insights about intermediate outcomes and contingent factors, insights that may put managers in a position to ensure the success of HRIS investments. Understanding which factors are affected by the investment can also aid in further refining magnitude estimates and is essential for estimating value. Cascio (2000) provides a complete list of the costs of voluntary turnover. In addition, there are several metrics important for measuring the effects of turnover, such as “time to fill,” “turnover costs,” “vacancy costs,” and “vacancy rate.”

Methods for Estimating the Value of Indirect Benefits

Direct revenue enhancements or direct cost reductions are typically estimated in dollars, so their value is provided by the total estimate. Estimates that are developed in other metrics, such as total absenteeism in days lost, must also be converted to dollars. For indirect benefits that can be tied more directly to cost reductions or revenue enhancements (i.e., new products developed or market share increased), the task is somewhat more difficult, but it can be done. It requires estimating the strength of the relationship between the change in intermediate outcomes and changes in revenue or cost (e.g., each new account will generate $50,000 in gross profit annually; reducing scrap by 5% will save $10,000 per month). For other outcomes, such as employee time saved, these conversions are somewhat more difficult to conduct.

For this last category, employee time saved, one method for estimating the value of employee time is **average employee contribution (AEC).** This method is an alternative to a practice that is *not recommended*—estimating an

employee's value as equal to his or her cost to the organization. In nearly all cases, the employee's cost to the organization dramatically underestimates the average employee's contribution. We know that this is true because most organizations are profit-making concerns. For an organization to be profitable, each individual in that organization, on average, contributes enough value to compensate for the cost of his or her wages and benefits and for the outlay on the equipment and facilities employed on the job, in addition to covering taxes and accounting for profit. This scenario helps explain why downsizing does not always improve financial results. Downsizing only makes sense when the contribution of the employees eliminated is less than their cost in salary and benefits to the organization.

Average Employee Contribution

In the turnover example discussed earlier, estimating the value lost while a position remains open (i.e., the region represented by the area *A* * *B* in Figure 7.2) requires an estimate of the value of the average daily contribution made by an employee. The average contribution approach argues that the AEC in an organization is equal to total gross profit divided by the number of employees or FTEs. FTEs are the budgeted number of positions for each job in an organization. AEC is not a metric that most organizations track, although a measure of average daily gross margin (i.e., net revenue – cost of goods sold) generated per salesperson would be an example of this type of measure. This is one of the simplest metrics that captures AEC as accurately as is needed for estimating the value of indirect benefits.

AEC = (Net revenues – Cost of goods sold)/No. of employees

By definition, in a profitable organization, this number will be substantially higher than labor costs, which is the sum of total employee pay and benefits. Dividing this number by the number of workdays in a year (i.e., 252) produces an estimate of average daily contribution. Note that in this method, as indicated in the previous equation, contributions attributable to employees are not reduced by the organization's capital expenditures and other nonemployee-related expenses—the equipment and tools that aid employees

in doing their jobs. The reason is that these tools are used to enhance employee contribution. The tools enhance what employees can do, but they do not generate contribution on their own. That is, if you take away the employees who use the tools and equipment, the contribution goes with them. The tools provide no independent and unique contribution to the organization in the absence of the employee; employees use these tools at work to make themselves more effective.

AEC can be used to estimate the average annual contribution of an organization's employees. Obviously, average contribution can and does differ across jobs. Thus, organizations may want to adjust this number up or down for specific jobs to recognize differences in contribution potential. Jobs that more closely support the organization's mission and offer jobholders broader authority to influence the work of others, and greater autonomy for choosing how and when work will be accomplished, are likely to offer above-average levels of contribution. The advantage of this method is that it establishes a baseline contribution value for each of the different jobs, one that is consistent with the actual financial performance of the organization.

Average contribution estimates, though, provide little guidance in estimating differences in contribution between employees holding the same or similar jobs. This calculation is represented in the turnover example in Figure 7.2 by the difference between the values *C* and *D*—the differences in contribution for two different employees who might hold the same position. Differences in contribution can be developed using internal assessment by examining directly the individual employee differences (variance) in the work outcomes produced by a large number of individuals holding equivalent positions. This assessment can be accomplished more readily for jobs when individual production rates can be monitored (i.e., sales, transaction processing, and some manufacturing settings). It is important to understand the difference between AEC and the variance of work outcomes by employees. AEC is the average contribution of work outcomes, and it can be estimated for entire organizations or for individual jobs. So it would be fairly easy to calculate the AEC for sales representatives by week by adding the sales for all representatives and dividing by the number of representatives. However, this does not tell us the range or variance in the weekly sales for the representatives. Some individuals could have done poorly in terms of weekly

sales whereas others could have done quite well. This variance in productivity is very important in the calculation of utility analysis (Boudreau, 1991; Cascio, 1987, 2000; Schmidt & Hunter, 1983), which is beyond the scope of this book.

Numerical Example for Figure 7.2

Cascio (1991, 2000) devotes an entire chapter to "The High Cost of Employee Turnover," and provides some numerical examples for the calculations of employee loss. Cascio also provides the both general and specific categories, similar to the ones already discussed, for the costs involved in employee turnover. By using Cascio's categories and numbers, the calculations required in Figure 7.2 will be done. The first general category in Cascio's list, Measuring Separation Costs, measures the following cost items: *the exit interview,* the administrative functions related to termination, and *the cost of replacing employees.*

The interview combines the cost of the interviewer's time both prior to the interview and the time for the interview. This interview also has two other cost factors—the cost of terminating the employee, which is measured by the time required for the interview multiplied by the average daily pay rate for the terminated employee. This value is part of the separation costs, but the time (in days) to replace the employee multiplied by the average daily pay rate for the terminated employee must be added to the interview costs to have a better total costs. Looking at Figure 7.2, this total cost represents a part of *A.* This total cost can also be calculated for a month or a year. If the exit interview process takes one hour, 15 minutes for preparation and 45 minutes for the interview, then multiplying by the interviewer's pay rate at $15/hour is one part of determining the value of *A.* The second part of the cost for the exit interview is the cost of the terminating employee's time. If the employee earns $11.80/hour, that is multiplied by .75 (approximate time for the interview) to get costs incurred by the exit interview by the employee. If we add these two costs—$15.00 plus $8.85 ($11.80 times .75), we can calculate the *total costs of the exit interview to be $23.85,* that is, part of the value for *A* in the figure. If there are 100 turnovers in one year, then the total cost for the exit interviews for the year would be $2,385.00.

The second specific cost category identified by Cascio is the Administrative Functions Related to Termination. This category involves the time required by the HR department in completing the administrative functions multiplied by the average HR employee's pay rate. If the HR employee's average hourly pay is $15.75 and the administrative functions meeting takes two hours, *the total cost for this category is $31.50.* Adding the total cost for the exit interview to this cost means the total cost of terminating one employee is $55.35—$23.85 plus $31.50. This value is another part of *A* in Figure 7.2.

The final specific category identified by Cascio is the separation pay for the terminated employee. If the average daily amount of separation pay by employee, the total in this example *would be $472.00 as the average separation pay per employee terminated*—calculated by multiplying 40 hours/week by $11.80/hour. This value would be the last part of *A* in Figure 7.2. Adding the three costs would be $23.85 + $31.50 + $472.00 = $527.35. The total of Separation Costs would be $527.35. This means the total costs of separation of terminated employees by year would be $52,735 (100 turnovers * $527.35 = $52,735).

The general costs incurred by an organization in replacing a terminated employee are defined as replacement costs. These costs represent *B* in Figure 7.2. The specific cost categories include the following:

1. Communication of job availability
2. Pre-employment administrative functions
3. Entrance interviews
4. Testing
5. Staff meetings
6. Travel/moving expenses
7. Employment medical exams
8. Dissemination of information after hired

As expected, many of these costs involve personnel time by time spent on the activity, both from the HR department as well as managerial time.

Most of the measures of these specific cost categories are common sense, for example, advertising and employment agency fees, costs of tests as well as cost of time for test administration by HR department, and pre-employment

administrative functions multiplied by an HR professional's time to complete the tasks involved. Thus, it seems that examining most of these costs would not be fruitful. The interested student can check Cascio (1991, 2000) for details from the chapter on the high cost of employee turnover. However, remember that these costs are shown as *B* in Figure 7.2 and represent the number of days that a position is filled.

In addition, new employees can either increase or decrease separation costs due to their effectiveness in their job performance after being hired. Thus, from Figure 7.2, *C* represents a new hire that is more effective in fulfilling the requirements and tasks of his or her new position than the employee who left; whereas *D* represents a new hire that is less effective in fulfilling the requirements and tasks of the new position than the employee who left. The gray area *E* in Figure 7.2 represents the loss of contribution by the new employee who is learning the job and can be quite variable depending on the individual. That is, some people learn to perform the requirements and tasks of the job faster than others and this cost would be positive, thus, reducing total cost of the termination and replacement. Of course, the slow learner on the job requirements might be terminated and thus the organization would incur additional termination and replacement costs.

Estimating the Timing of Benefits and Costs

Once you have identified and valued the sources of benefits and costs associated with an investment in HRIS functionality, the next step of the analysis is to determine when in time each benefit and cost will be incurred during the entire HRIS project. Organizations use this information to estimate the cash outflow and inflows associated with investments. The timing of cash flows is particularly important when costs and benefits occur in different time periods and when the organization's cost of capital is relatively high.

The task of assigning the benefits and costs to time periods can be accomplished by constructing a simple grid that lists benefit or cost items along one axis and future time periods on the other axis. The number of time periods required will depend on the expected useful life of the investment and the relevant length of time periods (usually years, but months or quarters may be used in some instances). The critical period for most HRIS investments is

the first five years. Few organizations are likely to approve HRIS investments with longer payback periods. Furthermore, current rates of development of HRIS functionality and computing systems suggest that most HRIS investments may be functionally obsolete after five years.

The Role of Variance in Estimates

Since the estimates produced for cost-benefit analyses are necessarily based on forecasting future events and may also depend on events outside the control of management, actual outcomes are likely to deviate from those estimated. For example, one may expect an average reduction of two hours in transaction processing time. However, the actual amount of reduction will vary depending on the mix of transaction types, operator expertise, and other job requirements, and could range from 105 to 135 minutes. *The primary estimate of interest is the overall average expectation.* However, particularly for indirect benefits, it is useful to develop expectations about the range and potential distribution of possible outcomes. Lower- and upper-bound estimates as well as deviations from the average (variance) for magnitude and value estimates are useful auxiliary information that can help convey expectations about potential variability in outcomes.

Variance estimates can be developed by each of the estimation methods described in Table 7.3. For direct estimation, HR and IT professionals could produce estimates of the range and likelihood of various outcome levels. In addition, multiple estimators could be used if two or more equally knowledgeable individuals exist. Each could be instructed to estimate a target value and upper and lower bounds for the estimated expectations, and these could then be averaged to develop overall estimates. Variance estimates for benchmark data from other organizations in the same industry are more difficult to acquire, since most sources only report averages and do not report variance data. In some instances, it may be possible to request the standard deviations associated with each benchmark value from other organizations. However, with internal analysis, variance estimates can be calculated from the archival records of existing HR or IT processes before and after implementation. In all instances, an estimate of the variance of outcomes could then be used to provide a range of the most likely outcomes. However, remember that, in the absence of compelling evidence to the contrary, the

best estimate is the one you developed, and that should be the focus of your analysis.

Avoiding Common Problems

It is not uncommon for HRIS CBA to include an extensive analysis of costs matched with a single source of benefits—typically, an estimate of direct cost reductions. Recognizing only direct cost reductions is problematic for two reasons. First, it ignores HR's more strategic role in improving organizational effectiveness. Online recruitment that results in hiring employees with higher potential and in developing and administering training programs through online tools, for example, is designed to enhance employee job performance and organizational effectiveness—not necessarily to reduce employee headcount. Ignoring these benefits can lead people to dramatically understate the actual value of HRIS investments.

A second problem is that, in many instances, items listed as direct cost reductions are actually indirect cost reductions. Time saved is a prime example. An HRIS will reduce the amount of time required to complete typical HR transactions, but these time savings do not result in actual reductions in overtime or headcount. In these instances, time saved is actually an indirect benefit. Its value depends on how individuals spend the extra time made available to them. As noted in Chapter 1, transactional activities deal mostly with day-to-day record keeping—for example, entering payroll information or employee status changes—and the administration of employee benefits. An HRIS that reduces the time on transactional activities would allow the HR employee to spend more time on traditional or transformational activities (see Chapter 1), both of which can assist the organization in meeting its strategic goals.

Incorrectly recognizing time saved as a direct cost reduction creates the wrong expectation among decision makers. This false expectation can lead to the incorrect perception that an investment did not succeed—no reduction in payroll expenses occurred—when, in fact, the benefits to the organization actually occurred in other forms. This point is illustrated in a CBA completed by the National Institutes of Health's Center for Information Technology. This analysis, which does an exceptional job of cost analysis, includes only

one source of benefit—employee time saved. In this example, investing in the new system was projected to reduce staff time required by 75%, resulting in a 53% ROI.

Admirably, this organization was required to conduct a postimplementation review within 18 months to examine actual versus estimated costs and benefits and to determine whether use of the new system should be continued. The postimplementation analysis revealed that time saved was only 50%, not 75%. As a result, instead of the expected 53% ROI, the revised ROI was only 6%. One can only wonder what might have happened if the postimplementation review indicated the amount of time saved had been only 45%. In that case the CBA formulas would have shown a negative ROI. Would this organization have been forced to abandon this new system? Interestingly, in the postimplementation analysis, the evaluators pointed to other benefits to justify the continued use of the new system. However, since they were not included in the original analysis, bringing them into the postimplementation review may have been seen by some as inappropriate. Nevertheless, an indirect benefit, such as the improved employee morale that analysts found in the **postimplementation evaluation,** would be a powerful indication that the HRIS investment was worthwhile. In addition, employee morale has been directly linked to voluntary turnover, for which costs can be measured.

Third, be sure that value estimates assigned to time saved are reasonable. Many HRIS investments purport to save employee time, making it a common component of an HR technology CBA. When new HRIS functionality will save enough time to make it feasible to reduce the number of employees or reduce overtime expenses, time saved is a source of direct cost reduction. However, more often HR technology saves time in smaller increments that do not permit direct savings. That is, the amount of time saved does not permit whole positions to be eliminated. In these circumstances, time saved is an indirect benefit. The value of the time saved actually depends on what value-generating activities employees engage in during the time made available to them. For example, if the implementation of self-service functionality reduces workload but does not lead to headcount reductions, the new functionality might still have tremendous organizational value if those saved hours are used to improve the effectiveness of recruitment efforts or some

other value-generating activity, such as the development of a team-training program.

Time saved, though, may not always have value. Consider a situation in which an individual engages in an activity that requires five minutes every day, but the application of new HRIS functionality is estimated to cut this time from five minutes to one minute. What is the value of the four minutes saved each day? Generally, larger blocks of time are more easily employed in value-enhancing activities. Consider your own use of time during the day. Could you constructively employ an additional minute of time each day? In most cases, we already have several of these minutes in our schedule that, because of the ebb and flow of daily events, are difficult to use productively. Therefore, it is questionable whether most employees can consistently use short periods of time (i.e., blocks of less than five minutes, for instance) productively. Thus, it may be very difficult to generate value for HR technology that is expected to save time but does so in many small increments.

Obviously, knowledge of your organization's business, as noted earlier in this chapter, will be important in identifying potential benefits. Use your own knowledge, but enlist other knowledgeable professionals and managers in this process as well. Individuals in your organization who are currently responsible for HR functionality prior to implementation of the HRIS (i.e., staff engaged in recruiting) or who are downstream customers of these HR products or services are good resources to enlist to identify benefits. They can help fill in the gaps and highlight other sources of benefits that might not be readily apparent to others. Vendors are a second resource. A review of the features and benefits cited by vendors in the relevant HRIS product space can also be used to identify potential sources of benefits. Vendors may also provide case studies that describe the experiences of companies that have implemented their products and the outcomes that were affected in those organizations. Using a combination of these sources can ensure a comprehensive list of the benefits to be gained when new HRIS functionality is developed.

Packaging the Analysis for Decision Makers

When you have completed your analysis, you should have (1) data that identify each benefit and cost component examined; (2) estimates of the dollar magnitude of each, including upper and lower bounds; (3) estimates of when the organization will incur each cost and receive each benefit; and (4) documentation justifying each decision you made in developing these values. The importance of documentation has been emphasized in Chapter 6. After steps 1 to 4 are completed, the next step is to package the analysis for decision makers in your organization. Obviously, this process involves "selling" the analysis to senior management so that it will not be overlooked or minimized. Managerial decision makers prefer well-organized and clear CBAs to help them make their investment decisions.

Packaging the analysis for consideration by decision makers includes deciding what data to include and how the data should be organized. This process should be done with the entire project management team since the report must cover the entire HRIS project, not just the investment analysis. A table outlining the value and timing of costs and revenues is likely to be the central focus of the analysis. Some experts encourage limiting the number of sources of benefits presented to decision makers to simplify the presentation and the required justifications. This approach is satisfactory for small projects such as applicant tracking, but would be inappropriate for a complex HRIS project.

Although being able to make your case on a single page is beneficial, there are several advantages in including all the cost and benefit components that influence the likely outcomes of the investment decision. First, this offers the most complete, best estimate of the value of the investment, thereby giving decision makers the best information to make an appropriate investment decision. Second, it provides the decision maker with a fuller understanding of the investment and of the impact of the investment on the organization. Particularly with respect to indirect benefits, contingent actions taken by managers are likely to influence the extent to which the estimated benefits will be achieved. Making decision makers aware of these contingencies can help enlist their assistance in ensuring each investment's future success.

Summary

Accurately identifying and estimating the value of the benefits and costs of

new HRIS functionality will play a critical role in HRIS investment decisions in the foreseeable future. A renewed interest in detailed investment analysis is healthy and should be embraced by analysts and decision makers. In addition to supporting improved investment decisions, detailed CBAs of HRIS investments are also likely to identify implementation contingencies and opportunities that can increase the chances for successful implementations. These analyses also provide the desired organizational targets against which to judge the effectiveness of an investment after implementation.

Key Terms

Discussion Questions

1. How has the use of HRIS evolved over the past 10 years in organizations, and how might this influence an organization’s evaluations of additional investments in new or updated HRIS functionality?
2. Why is it important to estimate the benefits to be derived from new

HRIS functionality before you estimate the costs? If costs were estimated first, how might this change the analysis?

3. Develop an argument for the implementation of an HRIS using a risk reduction strategy and an organizational enhancement strategy.
4. Organizations have traditionally used “employee time saved” as the primary source of benefits to justify HRIS and other types of information system investments. Why can this be problematic? Give several reasons and relate them to conducting a CBA.
5. How might an organization estimate the direct and indirect benefits of a new HRIS that decreases the time required by employees to complete transactions of the HR department through the implementation of employee self-service by creating employee portals (see Chapter 10) and allows HR employees to work on other projects such as talent management or online recruiting?
6. What makes indirect benefits so difficult to include in a CBA? What techniques might be used?
7. When should benchmarking be preferred to direct estimates of the magnitudes of benefits? When should direct estimates be preferred? Is it appropriate to use both?
8. Why does average employee contribution offer a better estimate of the contribution of individuals to an organization than total compensation (wages, incentives, and benefits)?
9. What are the factors you would have to use in calculating a cost-benefit ratio to support a decision to purchase a new HRIS when the organization already has an HRIS that was acquired 10 years ago? Be sure to mention the factors that would comprise the costs, direct and indirect, and the benefits, direct and indirect, of the current system versus the proposed system.

Case Study: Justifying an HRIS Investment at Investment Associates

Investment Associates, Inc. (IA)2 started as a small firm in 2001 with four employees plus its owner, Jim Tower. The company specialized in providing financial investment and tax advice to its clients. Jim had brought a substantial number of clients from his private practice, which had become too

large for him to handle by himself. His four employees included three colleagues who had some experience in financial investment advice and a secretary/administrative assistant. Jim and his three colleagues were all certified public accountants (CPAs), and a considerable portion of the company's business was in tax consultation and the completion of individual and corporate tax returns.

IA was quite successful and, by 2007, had added 42 new employees—financial and tax advisers and additional administrative staff, including an office manager, Marian Sweet. In addition to the office manager's supervisory tasks, Marian had to complete federal and state reports on the employees as required by law.3 However, Marian was not trained in HRM, and she suggested to Jim that the company needed to hire someone with a background in HRM before they "got into trouble" with the government. Marian was particularly concerned about gender and racial discrimination but did not understand how to apply the provisions of the appropriate laws and guidelines.

In November 2007, IA hired Sylvia Wong, who had an undergraduate degree in psychology and four years' experience in HR. In addition, in December 2007, Jim was negotiating to purchase the financial consulting business of an old friend who was retiring. This purchase would mean the addition of 17 new employees in February or March 2008. Sylvia met with Jim in mid-January 2008 to discuss the growing burden of employee reports and payroll processing, all of which were currently being done using a paper-based HR system. She advised Jim that the company needed an HRIS to process employee records and complete the required government reports. As an example, she stated that, because she had to search through paper copies of all employee files, it took her a full week to complete the Equal Employment Opportunity Report (EEO-1)4 required by the federal government. Furthermore, based on this report, it appeared that the company could have problems in terms of compliance with several federal laws. She suggested that the company purchase an HRIS to assist with company record keeping and the production of required reports.

Since the company had been using computer-based applications for financial analysis and tax reporting, Jim thought that Sylvia's suggestion to

computerize employee records was a good one. However, given his financial background, he wanted Sylvia to develop a business case, including a cost-benefit analysis, for the purchase of an HRIS.

Your task is to help Sylvia justify the purchase of an HRIS.

Case Study Questions

1. What approaches to justifying this investment might Sylvia consider?
2. What are some of the costs and benefits involved in this investment in an HRIS? Which would you be sure to include in your CBA of this project and why?
3. Explain how to estimate costs and benefits, both direct and indirect, in terms that Jim will understand. (Remember, Jim always has his eye on the "bottom line.")
4. Explain how to calculate a CBA to justify the HRIS project. Would you use cost reduction or organizational enhancement (or both) as a strategy for justifying the purchase?
5. What are the three common problems that could occur in your CBA for an HRIS? How would you avoid them?
6. What are some of the ways you can use the HR metrics that would be available after the implementation of an HRIS to justify its purchase?
7. Finally, and most important, explain how variance estimates that can be generated for a CBA would be useful to Jim in the management of his company.

2. The names of the company and employees are fictional to protect confidentiality.

3. See Chapter 8 for a discussion of some of these reports.

4. See Chapter 8.

Industry Brief: Deb Cohen, Deb Cohen LLC

An effective HRIS is key to the operations of HR today. Huge amounts of people-related data currently exist, and a major goal of HR professionals is

turning these data into meaningful information that can facilitate analytical thinking. To be effective, any system adopted must not only provide effective data management capabilities, but most importantly, it must do so within the financial constraints facing the organization.

So what are the financial considerations when debating what HRIS to deploy? Four important considerations come to mind: cost, return on investment (ROI), efficiency, and strategic planning. Taken together, these four factors assist with decision making and can ensure that there is alignment between an organization's HRIS, HR strategies, and business objectives.

- *Costs* focus on the expenditures for the HRIS. More importantly, what is the expense for integrating the HRIS with existing accounting systems or other key IT systems? Often, there are significant expenses in creating meaningful data links with other systems. Having an HRIS that does not provide relevant information or tie to other key systems will negate the potential value. As a result, the cost of a system is not a single line item. It is often associated with additional operational expenses. A key challenge for HR is understanding the system and integration needs for an HRIS so that the proper investment is made to ensure the system can be effectively used. A further challenge for HR is in having the necessary acumen to talk with IT and finance professionals to ensure the proper integration.
- *Return on investment (ROI)* asks, what is the value gained from using an HRIS in relation to the cost, both initial and ongoing? ROI is a fairly straightforward calculation. However, an HRIS implementation may include both tangible and intangible returns and therefore require more complex interpretation. An HRIS has far-reaching uses and accrues benefits to both the organization and employees. For example, if a self-service kiosk design change will influence the number and type of transactions accomplished per hour compared to a live customer service representative, both HR and the organization need to quantify what the cost and return will be for the investment.
- *Efficiency* asks, what is the full capability of the HRIS and is it deployed in a way that it is used effectively and to full potential? Using the HRIS should allow HR professionals to more easily evaluate HR data with

respect to such things as benefits usage, performance management, and talent analytics—all of which have direct impact on financial considerations. Using the kiosk example above, if the design change drives more traffic to the kiosk and creates greater efficiency, what are the implications for staffing and customer engagement? The challenge is to understand and show data about how efficiency may influence other organizational considerations that have cascading financial considerations.

- *Strategic planning.* Executives are demanding more from HR and demanding greater availability of useful data as input into decision making. Business today is flooded with data and a key to success is in knowing the questions to ask, making sense of the data, and interpreting the data in a way that will facilitate and support strategic planning—tying to decisions to financials is important. In making the case for evidence-based decisions, HR must be able to challenge other executives with things like market research for employee impact, not just product impact. HR must talk the language of business and demonstrate ROI and critical analysis to help the organization see the value of an HRIS and the evidence of better business decisions and outcomes.

Financial considerations in purchasing and deploying HRIS are complex and should weigh a variety of factors that are both tangible and intangible. Thinking about what a system costs but not considering the potential benefits from engaging employees, providing insights to managers, and assessing the strategic value of predictive data will not serve an organization well. Functionality is important, as is seizing the possibilities and fully embracing them in all aspects of HR and strategic planning.

Student Study Site

Visit the Student Study Site at **study.sagepub.com/kavanagh4e** for additional learning tools such as access to SAGE journal articles and related Web resources.

Part III Electronic Human Resource Management (eHRM)

8 HR Administration and HRIS

Linda C. Isenhour

Editors' Note

This chapter begins the third section of the text and introduces the concepts of electronic human resource management (eHRM) more fully. Specifically, it discusses how an HRIS can support HR administrative functioning more fully. It is appropriate to begin a discussion of the eHRM chapters with an introduction to HR administration. The first seven chapters of this book explained how to build an HRIS, so, in a sense, these chapters were the building blocks for the HRIS "house." Now the filling of the house begins. One of the crucial outcomes of following the advice from the first seven chapters is that employee data be current and accurate. In this chapter, the author introduces how an HRIS can help HR fullfill its administrative role and how it can be used to manage employee data and support required government reporting. It starts with the critically important task of job analysis and how an HRIS can support organizations to develop and manage information on their jobs, which can in turn support HR functions, such as recruitment and compensation, with confidence. The chapter also introduces the concepts of self-service and discusses how having employees and managers manage their own personal data can be advantageous for the firm. However, any approach to managing data has risks, which are also discussed. The chapter also discusses how and when HR and/or HRIS outsourcing may be appropriate. Finally, the use of an HRIS is also critical for government reporting and compliance with laws and guidelines. Therefore, the chapter closes with a discussion of how an HRIS can support organizations as they supply data in support of a number of these government regulations and laws.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the basic role of job analysis in human resources and explain the role of HRIS in supporting job analysis
- Discuss the complexity of HR administration and the advantages of an HRIS over a “paper-and-pencil” HR operation
- Discuss the advantages of having a service-oriented architecture (SOA) for the HRIS
- Differentiate among the four structural approaches to HR administration service delivery (i.e., self-service portals, shared-service centers, human resource outsourcing, and offshoring)
- Discuss the advantages and disadvantages of each of the four structural approaches to HR administration
- Understand how legal compliance with government mandates is an important part of HRIS functionality and how these mandates add to the complexity of an HRIS in both domestic and multinational organizations
- Discuss the various privacy laws, particularly as they relate to an HRIS
- Discuss the elements important to successful measurement of the strategic alignment of the HR balanced scorecard and how this alignment is related to the strategic alignment of an organization

HRIS In Action

In 2015, Procter & Gamble (P&G) had 110,000 employees in 70 countries. Identifying common measures, improving employee service, and reducing HR administrative costs continued to be strategic imperatives for this global consumer products company committed to ensuring its principles: “Everyone Valued, Everyone Included, Everyone Performing at Their Peak” (Procter & Gamble, 2011, 2015).

Today, the human resource managers at P&G continue to consider a variety of solutions to meet their strategic goals. Should they maintain their decentralized global operation in HRM and use technology such as Internet service portals to improve efficiency? Would the trend toward shared-

services centers (SSCs) be better for centralizing operations? How will decisions about outsourcing selected human resource functions be affected by cloud and mobile computing advances? With so many countries and governmental regulations involved, how can P&G achieve sufficient standardization through an HRIS to gain increased savings and still meet its varied responsibilities to such diverse entities? Will its internal customers view the move from decentralized to centralized shared services as meeting their needs? How will such changes be measured from an internal customer satisfaction perspective? Which measures for the various administrative approaches will best align the HR functions with the P&G balanced scorecard strategic goals and objectives?

These are common HRM problems faced by businesses today. This chapter provides a framework to help answer such questions.

Introduction

> *Human resources isn't a thing we do. It's the thing that runs our business.*
>
> —Steve Wynn

Human resource management (HRM) administration deals with the efficient performance of the transactional activities introduced in Chapter 1. Record keeping, updating policy and informational materials for a self-service portal, generating and disseminating internal reports, complying with governmentally mandated external reporting, and administering labor contracts are all examples of HRM administration associated with managing an organization's workforce. Approximately 65% to 75% of all HR activities are transactional (Wright, McMahan, Snell, & Gerhart, 1998). Human resource information systems (HRIS) are vital tools in managing these increasingly complex transactional requirements. For this reason, it is crucial that the employee database, frequently referred to as the **employee master file**, be carefully constructed so that the information is *accurate and timely* (Kavanagh, Gueutal, & Tannenbaum, 1990; Walker, 1982). The employee

master file is a record and repository for all relevant employee information and must be created prior to any other modules for programs, such as recruiting and applicant tracking. The approaches and technological techniques described in this chapter ensure that the employee master file, once initially built, remains accurate and up to date.

Technical Support for Job Analysis

A primary goal of an effective HR department is to ensure that the organization has the best available people working in the proper jobs at the appropriate time to maximize the organization's productive capacity in pursuit of strategic goal achievement. To do this, however, the organization must know not only what each job entails, but also what **knowledge, skills, and abilities (KSA)** are necessary to perform the job successfully. Job analysis provides both types of information. Specifically, job analysis is the process of systematically obtaining information about jobs by determining the duties, tasks, or activities of jobs, from which KSA can be estimated. From this analysis, job descriptions can be developed. Job descriptions define the working contract between the employee and the organization. Job descriptions uses include (1) evidence for any litigation involving unfair discrimination in hiring, promoting, or terminating employees; (2) development of all the HRM programs, especially talent management in organizations, and other important HRM programs including recruitment, selection, training, and performance appraisal; (3) development of compensation structures; and (4) employee disciplinary programs and union grievances. In fact, job descriptions are often termed the "heart" of the HRM system. Given the importance of job descriptions, it is *critically important that they be accurate and timely.* Effectively managed HR departments capture and store the results of all job analysis and job descriptions within the HRIS to facilitate future changes in jobs required by reorganizations, mergers/acquisitions, technology, and market-driven customer expectations.

Approaches and Techniques

A variety of approaches to job analysis are covered in detail in other sources (Ghorpade, 1988); thus, only a general approach to conducting job analyses

will be discussed in this chapter. Job analysis involves the following phases or considerations:

1. Identify the sources of information about the job. The best sources are usually job incumbents and their supervisors; however, professional job analysts can be used for newly created or complex jobs. Company records and the Internet, specifically the U.S. Department of Labor's **O*Net database** (http://onetonline.org), are also good sources of information about jobs.
2. Identify the types of job information needed. This information can include tasks, duties, responsibilities, the knowledge required, performance standards, job context, and the equipment used. A determination of what specific information will be used for the analysis of all jobs must be made to maintain consistency across the final job descriptions.
3. Determine the appropriate methods of collecting the job data. Techniques include interviews, questionnaires, observation, and focus groups. The choice of technique(s) depends on the number of jobs to be analyzed and the funding available.
4. Consider using one or more of the standardized techniques for conducting job analysis to enhance the final job description, for example, functional job analysis, the **position analysis questionnaire (PAQ)**, task inventory analysis, or the critical incident method (see Ghorpade, 1988).

Regardless of the approach or technique used to analyze the jobs in an organization, the outcome must obtain accurate and timely job descriptions. Thus, a key question facing HR professionals is, how can technology assist HR in establishing and maintaining the accuracy of job descriptions?

HRIS Applications

The utilization of technology, including Web-based job analysis tools, has increased the availability of information supporting job analysis, reduced costs of collecting information, and enhanced convenience of collecting and analyzing information. For example, O*Net, an online repository of information on 1,000 broad occupations, can be used to help guide in the

development of job descriptions. Consider, for example, the occupation of professor. O*Net contains generic descriptions for professors of physics, architecture, sociology, forestry, business (e.g., see www.onetonline.org/link/summary/25-1011.00 for the summary description of the position "business teachers, postsecondary"). To ensure that the KSA list is accurate for a specific position in a specific discipline (e.g., human resources) at a specific university, additional information and reviews of this job description would need to be conducted. As another example, HR-Guide.com (www.hr-guide.com) provides a simple, free job analysis tool for HR professionals (www.hr-software.net/cgi/JobEvaluation.cgi). Finally, there are many different vendors who offer these tools as stand-alone products or components of a larger product offering.

Completing job analyses and deriving job descriptions can be accomplished through online survey techniques. Job analysis questionnaires can be administered online to job incumbents and supervisors, and the resulting job descriptions can be analyzed statistically to finalize job descriptions. This online questionnaire capability can be part of an integrated HRIS software package covering multiple programs (e.g., SAP, PeopleSoft) or purchased as stand-alone software. The position analysis questionnaire, for example, has its own software package (see www.paq.com/?FuseAction=home.main), and the Economic Research Institute (ERI) has **Occupational Assessor® software** (www.erieri.com/index.cfm?fuseaction=EDOT.Main) to aid in completing job analysis.

Maintaining accurate job descriptions can also be aided by an HRIS. Later in this chapter, service-oriented architecture with self-service portals for employees and managers will be discussed. These portals can be used to make sure that job descriptions remain accurate and timely. For example, if work procedures or new equipment is introduced, it would be easy to request that the persons affected by the change, both employees and supervisors, access their current job descriptions via portals to make necessary updates to the job descriptions. In addition, it is a good idea to establish an annual review of all job descriptions to maintain their timeliness. If a company requires annual reviews of employee performance, and these forms are generated by the HRIS, it would be quite easy to generate a copy of the current job description to accompany each request for a job performance

evaluation. The employees and the supervisors could then review the accuracy of the job descriptions and submit any changes necessary through portals. With accurate and timely job descriptions, human resource planning (HRP) is now possible.

The HRIS Environment and Other Aspects of HR Administration

HRIS can assist managers charged with improving the efficiency of HR administration by reducing costs, enhancing the reliability of reporting, improving service to internal customers, and facilitating strategic goal achievement. Information technology facilitates administration in multiple ways. First, an HRIS can help improve data accuracy by (1) reducing the need for multiple inputs, (2) eliminating redundancies in data, and (3) reducing the opportunity for human input errors and associated corrections. In addition, an HRIS, through *relational databases* (see Chapter 2), speeds the process of building reports with simple query capabilities. Moreover, an HRIS, if properly designed for flexibility, can support differences in reporting mandated by global governmental jurisdictions. Finally, a properly designed HRIS permits secure global distribution of data while providing the desired privacy for employee data, facilitating consideration of alternative methods of consolidating, and improving services to internal customers (Ceriello, 1991; Gueutal & Stone, 2005; Kavanagh et al., 1990; Osle & Cooper, 2003; Walker, 1982, 1993, 2001).

Administrative issues associated with specific HRM functions as part of the development and implementation of an HRIS have been briefly mentioned in earlier chapters (e.g., recruiting, training, compensating) and will be discussed in more detail in later chapters. However, HR managers face a variety of other administrative requirements in the rapidly evolving HRIS era. The HRM administrative issues highlighted in this chapter include (1) organizational approaches for providing HR in a global economy (i.e., self-service portals, SSCs, outsourcing, offshoring); (2) compliance mandates for record maintenance and report requirements (e.g., **Employer Information Report EEO-1**), which are associated both with government laws in the United States (e.g., **Occupational Safety and Health Act [OSHA]**) and with

the labor laws of other countries; and (3) the measurement of HRM contributions to an organization's strategic goals via a balanced scorecard.

HRM Administration and Organizing Approaches

Historically, HR managers operated as adjunct staff to organizations, overseeing the daily transactions associated with hiring, paying, or training employees and reporting on employee issues as required by managers in organizations. As organizations grew more complex, administering these daily transactions also grew more complex. The introduction of mechanization to handle payroll signaled the changing future of HR administration; technology would play an increasingly important role in managing daily employee transactions (Walker, 1982, 1993, 2001).

Today, computer hardware and the accompanying software packages offer considerable support for daily HR transactions and make it possible to move beyond the limited administrative approaches available to the HR managers of the 1950s (PricewaterhouseCoopers, 2006). Modern HR professionals use technology to more effectively support administrative activities and reduce organizational costs while improving data accuracy, employee productivity, and customer service (Bender, 2001; Ulrich, 1997). For example, 1,200 companies worldwide included in the 2015–2016 Sierra-Cedar HR technology survey reported plans to increase the use of some type of HR administrative technology to improve one or more of the following: recruiting (25%), onboarding (17%), core HR/TM profile (14%), performance (13%), as well as employee self-service (9%) and manager self-service (8%) (Sierra-Cedar, 2016). Moreover, global companies reported that, even with challenging economic conditions, they anticipated growing their technology commitment for strategic human capital talent management, as well as for workforce management, service delivery, and business intelligence. The next section briefly describes the enabling architecture that allows HR administrators to leverage technology.

Service-Oriented Architecture and eXtensible Markup Language

Service-oriented architecture (SOA) "is a paradigm for organizing and utilizing distributed [computing] capabilities that may be under the control of different ownership domains . . . providing a uniform means to offer, discover, interact with, and use capabilities to produce desired [business] effects" (Organization for the Advancement of Structured Information Systems [OASIS], 2006, p. 8). It is focused on providing overall service that is well defined, self-contained, and context and platform independent; in other words, it is focused on adding value to the organization's business purpose rather than simply adding technological value. In effect, SOA is a collection of internal and external services that can communicate with each other by point-to-point data exchange or through coordination among different services to achieve a business purpose. Figure 8.1 demonstrates the business-driven SOA process (Marks & Bell, 2006).

For example, an HR administration manager in the United States who needs to generate the government-mandated, annual EEO-1 cares little about where the information is stored or which applications, servers, communications technologies, or programming languages are used. Rather, the manager wants easy access to the myriad data necessary to complete the report in a timely manner. SOA focuses on fulfilling that need, moving away from a point-to-point perspective (e.g., HR linked to a single EEO database) to a market perspective of services, reusing data and applications from multiple sources as long as the required service is provided. The principles of SOA include loose coupling, flexibility, autonomy, standards-based computing, reusability, modularity, and services discoverability and optimization. The architectural benefits of SOA include (Campbell & Mohun, 2007)

- IT consolidation opportunities and standards-based integration, using a standards-based approach to integration for IT systems that are very complex and heterogeneous to reduce both cost and complexity over time;
- faster implementation and change management through reuse, modeling, and composite development; and
- improved alignment of business processes and IT implementation.

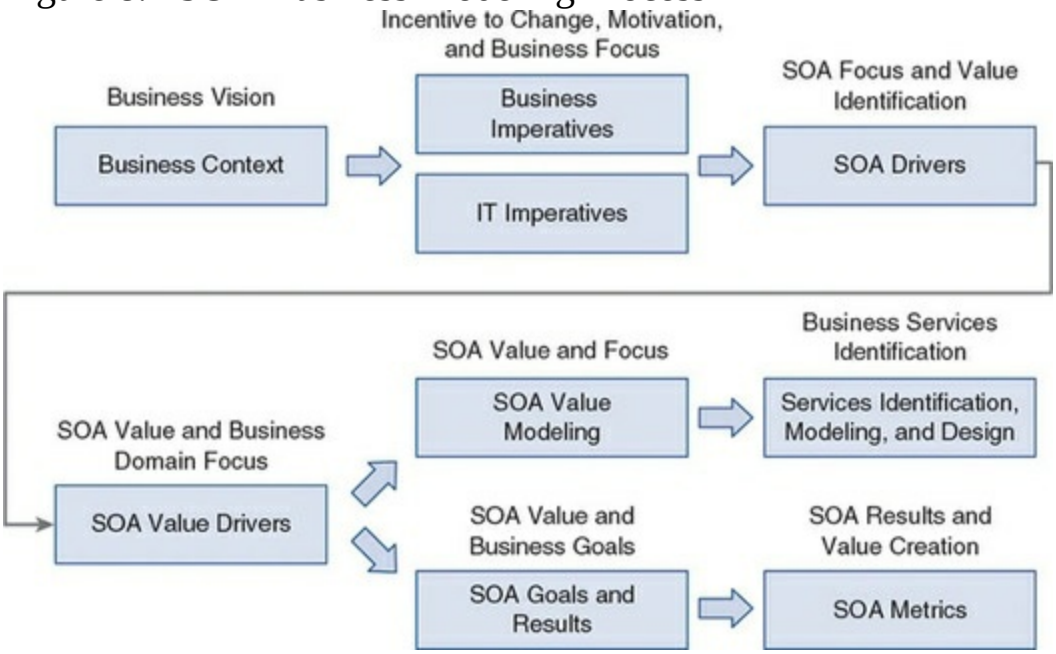
SOA is enhanced by eXtensible Markup Language (XML), introduced in Chapter 3. XML combines text and other information about the text, such as

its structure, allowing data sharing across different information systems via the Internet. XML underpins SOA such that SOA is ineffective without it. Specifically, XML improves interface technology through platform independence and protocols, such as security and transactions, previously unavailable in interfaces (Erl, 2005). Platform independence refers to software that does not rely on any special features of any single platform (e.g., Windows, UNIX) or, if it does, handles those special features such that it can deal with multiple platforms.

Advantages of XML-Enhanced SOA

Although HR professionals engaged in administration may not make final decisions about the information technology described previously, they need to recognize the benefits associated with having such architecture. For example, Schwartz (2003) reported that Oracle's introduction of HR-XML standards would reduce the requirement to input applicant resumes manually. Therefore, today's use of HR portals for job application receipt and processing, including resume submission, is related directly to this technology. Thus, HRIS capabilities are leveraged dramatically by SOA and XML such that (Lublinsky, 2007; Walker, 2001)

Figure 8.1 SOA Business Modeling Process



Source: Marks and Bell (2006, chap. 3).

- security is improved—this is especially important because of the privacy protection issues associated with HR data and applications;
- performance is enhanced—this aids in reducing transaction costs and increasing customer satisfaction;
- auditing capabilities are added—this supports the growing demand to demonstrate compliance with corporate quality and policy mandates;
- change capabilities are enhanced—this improves reaction time to better meet business-driven change requirements; and
- alternative HR administration structures (e.g., self-service portals, SSCs, outsourcing) are facilitated—this encourages HR managers to consider multiple approaches to meeting the HR administration goals of cost reduction and service improvement.

The remainder of this section will focus on the four structural approaches to HR administration facilitated by technology. Each has opened paths to increased efficiency and effectiveness, improved service, and cost controls, possibilities unimagined by HR professionals a decade ago. The four HR administrative approaches—self-service portals, shared-service centers, outsourcing, and offshoring—presented in this chapter are shown in Figure 8.2.

- The **self-service portal** is an electronic access point to an organization's HRM information, such as company policies, benefits schedules, an individual's payroll data, or other records; access may be via the organization's computers and intranet or remotely from other locations via the Internet.
- A **shared-service center (SSC)** is a technology-enabled HRM group focused on value creation by providing excellent service to internal customers while reducing costs through increased efficiency and continuous improvement.
- **Human resources outsourcing (HRO)** is the practice of contracting with vendors to perform HR services and activities.
- **Offshoring** is an extension of outsourcing that involves contracting with vendors outside a nation's boundaries to effect additional cost savings or gain other benefits over domestic outsourcing alone.

Following a discussion of the theories underpinning these approaches to HR administration, the purpose, advantages, and disadvantages of each will be highlighted. Next, the chapter will examine the different ways in which each alternative approach facilitates the HR administrative reporting mandated by government entities. The chapter concludes with a discussion of how each administrative alternative can be measured to demonstrate the value-added nature of efficient, effective HR administrative functions in support of an organization's strategic goals.

Figure 8.2 Typical HRM Administration Service Delivery Alternatives

Theory and HR Administration

The first theory that explains alternative approaches to HR administration is the **resource-based view** of the firm (Barney, 1991, 2001). Barney (1991, 2001), in delineating the resource-based view of organizations, argued that organizations are bundles of resources, identified as physical capital, organizational capital, and human capital. *Physical capital* includes an organization's technology, geographic locations, physical assets (e.g., plants, money), and access to raw material. *Organizational capital* includes its formal reporting structure; its coordinating, planning, and organizing systems; and its internal and external group relationships. *Human capital* includes the experience, capabilities, relationships, and insights of individual employees. Taken together, these resources are combined and managed to determine an organization's *opportunity* to win sustainable competitive advantage in the marketplace.

To achieve **sustainable competitive advantage**, a firm's resources, when compared with those of its competitors, must be *valuable, rare, difficult to*

imitate, and *invulnerable to substitutes.* Based on this theory, then, it is likely that innovative combinations of technology (physical capital), organizing systems (organizational capital), and strategic individual knowledge, skills, and abilities may serve to give an organization a strategic position in its marketplace. Thus, alternative HR administrative approaches seek to combine HR technology (e.g., HRIS and Internet) with organizing systems (e.g., self-service portals) and strategic HR knowledge, skills, and abilities (e.g., compensation expertise) to leverage a specific firm's competitive position. It is important to note that this theory suggests that *each* firm in an industry is likely to acquire resources such as human talent to support its *unique* combinations based on its **strategic choices**; it is this unique combination that leads to sustainable competitive advantage. *Merely benchmarking or following trends is unlikely to lead to sustainable competitive positioning for a firm!*

Walmart provides an example of this theory. In the 1990s, Walmart gained a substantial competitive advantage with its innovative combination of "just-in-time" supply chain management and proprietary technology. This approach linked each Walmart store directly to its suppliers such that the supplier was notified electronically when a product was sold; when a store's predetermined inventory level was reached, the supplier shipped replacement items without any interaction with store managers. This resulted in significant cost savings and improved service with fewer employees. For a time, it appeared that this innovation might lead to a sustainable competitive advantage. However, competitors were able to imitate the management supply chain techniques and even improve on the technology to negate the advantage. Walmart's innovation did lead to an advance for the entire industry but did not provide a sustainable advantage for the firm because the innovation could be imitated. Thus, organizations looking to achieve sustainable competitive advantage are more likely to reach that goal through *strategic and unique* combinations of physical, organizational, and human capital than by relying on any one resource.

A second theory that explains alternative approaches to HR administration is **transaction cost theory** (Coase, 1937; Williamson, 1975). Transaction cost theory suggests that organizations can choose to purchase the goods and services they need in the competitive marketplace or make those goods and

services internally. Transaction costs are the expenses associated with an economic transaction, whether internal or external. Managers can compare the transaction costs required to purchase products or services, such as contract administration, licenses, and delivery services, from external providers with those incurred in providing the same product or service internally by, for example, using additional personnel, retraining employees, or purchasing hardware and software. Thus, managers can make optimum economic decisions for their organizations. This decision is the classic "make or buy" economic choice facing rational economic actors. Behaving rationally, organizations would make such decisions based on total costs, choosing to "buy" from external providers when total costs were lower and products or services were readily available and choosing to "make" what was needed internally when total costs from external sources were higher or products or services were not readily available. Of course, this example assumes that the make or buy benefits of either choice are straightforward and equal. Typically, however, such decisions are more complex; thus, a cost-benefit analysis (CBA; described in Chapter 7) should be completed to determine if the organization should make or buy. For example, a small business might elect to buy HR compensation and payroll services from an external provider rather than decide to make its own HR compensation program, which would require purchasing hardware and HRIS software and adding compensation specialists.

General Motors (GM) provides an example of this theory. In the 1990s, amid market pressure to reduce costs as competitors increased their market share at GM's expense, GM elected to divest itself of its fully integrated parts manufacturing functions. GM managers found that transaction costs would be reduced if the company standardized automobile parts and purchased them from multiple external providers rather than continuing to manufacture them internally. Transaction costs associated with internal parts production were increasing rapidly in terms of employees' wages, salaries, and benefits and the ongoing maintenance of aging production plants. Thus, GM spun off its Delphi unit as an independent company in 1999. Although Delphi continued to sell to GM, GM no longer relied exclusively on the newly independent company for parts, helping reduce GM's overall corporate costs. Increasing internal transaction costs coupled with a robust external parts production market determined GM's strategic "make or buy" choice.

Both resource-based and transaction cost theories can explain the different choices organizations make in their preferences for HR administration approaches. For example, the increasing internal transaction costs of recruiting and hiring employees may lead to the search for an external vendor who specializes in the recruitment and selection of new employees. Organizations may then decide to compare those internal transaction costs and benefits with external transaction costs and benefits from the specialized recruitment and selection providers, leading to outsourcing. Alternatively, strategic concerns about the security of having external providers inadvertently "share" crucial talent-positioning information with competitors, coupled with the decreasing costs of technology, might lead an organization to focus on internal innovation involving physical and organizational resources (e.g., self-service portals coupled with SSCs) to reduce transaction costs, while increasing spending on strategic talent management issues (e.g., hiring, development) to achieve a sustainable competitive position in its industry. Keep these theoretical perspectives in mind as we examine each of the HR administration approaches.

Self-Service Portals and HRIS

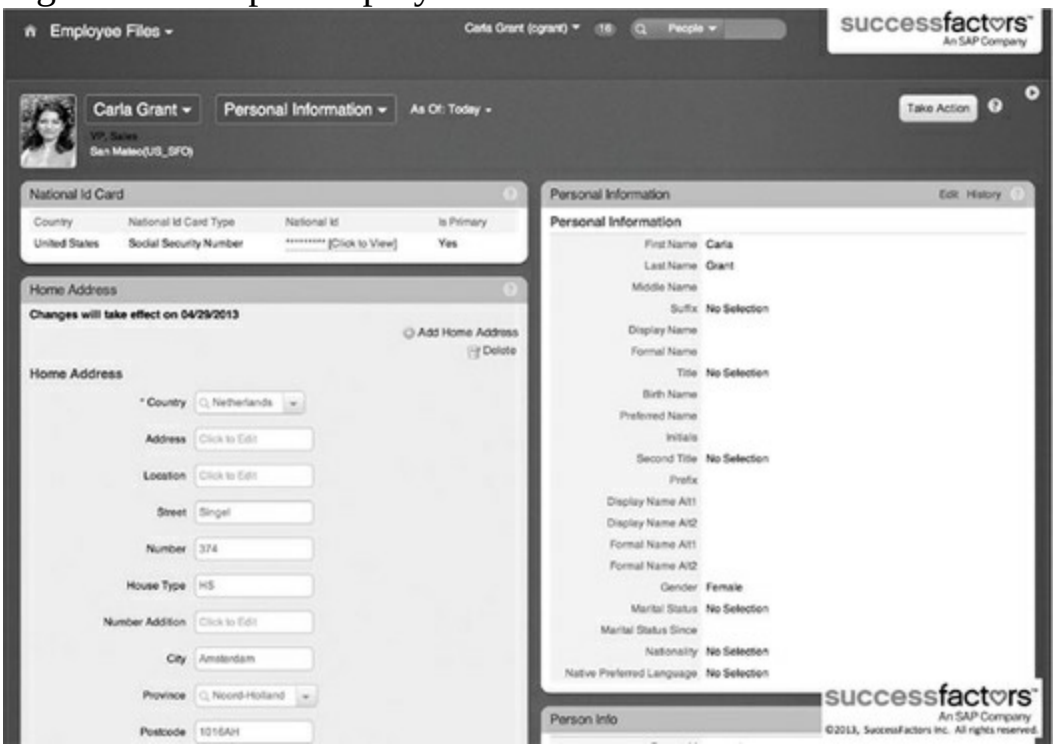
The first structural approach to HR administration (Figure 8.2), **employee self-service (ESS)** HR portals, provides an electronic means for a company's employees to access its HR services and information. Such portals provide a single sign-on capability for employees, who can individually complete transactions for their personal data. ESS portals can range from simple intranet websites that allow employees to access static HR policies, such as safety requirements, to sophisticated Internet websites that allow employees to access and change their individual records. For example, adding a new child to an employee's medical benefits, from any computer location on a 24-hour, 7-days-a-week basis, would be possible with ESS portals. A sample screenshot of an ESS screen for an address change is found in Figure 8.3 and a partial list of information and services commonly available via ESS portals is given in Table 8.1.

In addition to providing an interface for current employees, ESS portals are also available to prospective employees. For example, individuals who have applied for jobs online through an employer's website have accessed the HR

portal to complete the application and forward their resumes (Anheier & Doherty, 2001; Gueutal & Falbe, 2005; Walker, 2001).

Manager self-service (MSS) portals are becoming more prevalent in organizations as well. MSS portals are specialized versions of ESS portals designed to allow managers to view extensive information about their subordinates and perform many administrative tasks electronically, including traditional HR functions. For example, in typical MSS applications, managers can complete job requisitions and view resumes of prospective applicants. In addition, managers can view **performance appraisals**; subordinate salaries, productivity, and training histories; and model annual salary increases. However, MSS is not limited to HR functions and may also include budgeting and tracking, reporting, and staff policy and procedure development (Gueutal & Falbe, 2005; Walker, 2001).

Figure 8.3 Sample Employee Self-Service Screen



Source: © SuccessFactors, Inc. All rights reserved.

TABLE 8.1 ■ Sample Employee Self-Service Functionality

Communications	Benefits Services	Personal Data	Development
Review company communications	Research and view plan rules and requirements	Update emergency contact, address, telephone information	Enroll in training courses
Access company policies or procedures	Enroll in cafeteria-style programs (medical, dental, insurance)	Correct errors in personal data (degree, graduation date)	View completed training
Access HR policy manuals and e-mail inquiry or help request	Add or delete dependents	Change W-4 withholding forms	Access internal or external e-learning courses
Complete employee surveys or 360-degree feedback data	Model retirement or access 401(k) savings investment records	View previous or current pay and performance information	View or apply for internal job vacancies
View/respond to personal information requests from HR	Model health plan alternatives' costs (e.g., HMO, PPO)	Enter time reports, vacation or sick days, and travel expense reports	Complete employment tests for new jobs

Advantages of Self-Service Portals for HR Administration

Self-service portals provide several advantages for achieving HR administration goals, including (1) improved speed and quality of service to employees and managers and (2) simplified routine inquiries and changes. Reducing the number of inquiry transactions requiring direct HR staff involvement helps keep information current. For example, with self-service, changes in the doctors and hospitals allowed for each medical plan or status reports on the hiring of a new employee are more likely to be entered into the system as required. Self-service portals also enhance employee satisfaction by permitting employees to control when and where such access activities occur, empowering employees, increasing their productivity, especially for those who travel frequently, and offering privacy for those who prefer to handle such matters without the presence of coworkers. In addition, self-service portals facilitate easy, increased access to HR information, helping employees ensure that important personal data (such as individual job performance appraisals used by managers in making decisions about salary increases, promotions, or other employment rewards) are accurate and current.

Executives believe that having managers use more accurate, timely information contributes to improved managerial decision making (Gueutal & Falbe, 2005; Walker, 2001). Finally, self-service portals help reduce the

number of transactions for HR employees and, correspondingly, overall HR costs. For example, CedarCrestone's (2012) survey showed that companies with 500 to 10,000+ employees reported that those firms with minimal HR technology served an average of 93 employees per HR staff member. By comparison, organizations with ESS portals served an average of 99 employees per HR staff member, whereas those with MSS portals served an average of 118 employees per HR staff member. Organizations can realize cost savings of 67% to 99% on tasks such as changing employee information, providing current pay and benefit statements, and posting of jobs (Gueutal & Falbe, 2005). Such savings relieve HR specialists of routine transactional work and allow them to focus more on both the traditional and transformational strategic activities described in Chapter 1.

Disadvantages of Self-Service Portals for HR Administration

Although HR administrators can gain advantages from deploying self-service portals, they are also faced with multiple disadvantages. Permitting employees to access company data through self-service portals may increase the possibility of security breaches and the associated negative outcomes, like identity theft, for affected employees. Employees are concerned that even having their data in a company's HRIS can lead to misuse of such information by others in the organization and may feel their privacy is invaded when organizations fail to limit access to personal data housed in HRIS (Phillips, Isenhour, & Stone, 2008). For example, managers may learn negative information (e.g., that employees have medical disabilities) through MSS portal access that would have been unavailable in a paper record system. Even the inadvertent use or sharing of such information may preclude training or promotional opportunities for employees. Misuse of this personal information in this manner can constitute a violation of labor laws such as the **Americans with Disabilities Act (ADA)** in the United States. Privacy and security issues will be discussed in more detail later in this chapter, as well as in Chapter 15.

In addition to security issues, HR administrators may find that unions and managers resist using the self-service portals. In particular, unions may argue

that employees are “doing HR work” when they enter data and make changes online via an ESS portal. Union members who perform such transactions on their own time may request overtime pay for completing such functions or may choose to do such functions at work, thus reducing productivity. Managers may also resent having to do work that previously was handled completely by HR staff, particularly when such work involved calling the staff members rather than completing forms. For example, managers may have had relationships with HR staff that permitted the managers to bypass established procedures for requesting a new hire. Thus, using MSS portals would not only require more actual work for the managers, but also enforce standardized interfaces that might lead managers to perceive a reduction in their status and power in the organization. Accordingly, HR managers should recognize and take action to ameliorate such perceptions and concerns as part of the project management planning and implementation process for an HRIS.

Shared-Service Centers and HRIS

The second structural approach to HR administration, SSCs, generally appeared in response to the increasing globalization of competitive markets occasioned by the proliferation of multinational enterprises (MNEs). To compete successfully, organizations were pressured to reduce costs through the consolidation of administrative transactions, while still providing excellent service. Such a challenge involved balancing the desire for control inherent in centralized administrative structures and the desire for flexibility inherent in decentralized administrative structures—a constant organizational conflict within large and expanding corporations (Lucenko, 1998; Quinn, Cooke, & Kris, 2000; von Simson, 1990). Over time, many organizations have chosen SSCs as the structural solution to that pressure.

> Shared services is a collaborative strategy whereby [one or more] staff functions of a firm are concentrated in a semi-autonomous organization and managed like a business unit . . . to promote greater efficiency, value generation and improved service for internal customers. (Goh, Prakash, & Yeo, 2007, p. 252)

To emphasize this aspect of SSCs, some organizations have described them as “centers of excellence” (Bender, 2001). Figure 8.4 illustrates that SSCs include HR in 66% of manufacturing and 53% of service companies (Powell, 2004).

Powell (2004, p. 6) identified the following common elements of SSCs:

- Centralizing or decentralizing of business processes
- Using economies of scale to reduce unit costs
- Developing customer relationship models to better meet the needs of customers
- Concentrating on cost reduction to enhance competitive positioning
- Deploying quality tools to ensure continuous process improvement

To be successful, a shared-service center involving HR, for example, must view itself as an independent business unit offering products (e.g., HR reports), which it must “sell” to its customers at a price (internal transaction cost) they are willing to pay. These internal customers are managers in different business units such as operations and marketing. If the HR function is unsuccessful in reducing costs, providing desirable services, and adding value, it may find itself “outsourced” by business unit managers who perceive that they can get better service and value from an external provider. To demonstrate added value to the organization, the SSC should establish measures that demonstrate customer satisfaction levels, productivity, cost controls, and quality. Such measures are necessary to allow internal customers to assess the value of the consolidated unit and to facilitate continuous improvement by SSC managers.

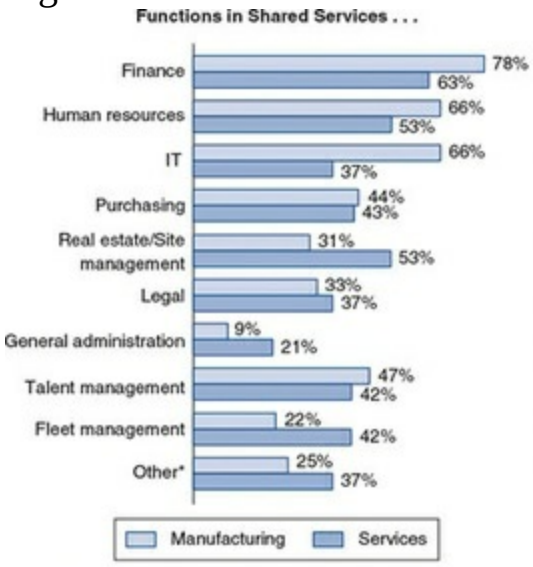
Accenture (2007) outlined several principles to embrace when considering the use of SSCs:

- Establish a “global good” vision for the SSC that includes its definition and benefits to ensure that business units “losing” functions are willing to make the commitment to transfer their work.
- Identify leaders, in all the affected groups, to sponsor the SSC vision, promote the center’s value to the organization, and serve as responsible change agents.
- Support transparency regarding who (e.g., affected employees), what

(e.g., which functions), when (e.g., transition plans), and where (e.g., location of the new center). This openness is essential to building the trust needed to initiate and maintain the center's effectiveness.

- Conduct initial and ongoing customer "values and requirements" meetings to build trust, establish performance and service expectations, and solve problems. Implementing jointly acceptable measures facilitates SSC success and internal customer satisfaction.
- Focus on viewing the SSC's processes in the context of the overall business functions. Examine the process behind each function from "end to end." Understanding the context of all processes in each function encourages the recognition of the interdependencies inherent in the SSC concept and bolsters the value-creating goal of SSCs.

Figure 8.4 Functions in Shared Services



. . . and the Percentage Covered*

	<25%	26–50%	51–75%	>75%
Finance	25%	25%	19%	31%
HR	31	27	12	30
IT	7	18	11	64
Purchasing	18	14	11	54
Real estate/Site management	10	14	5	71
Legal	–	–	13	67
General administration	–	–	17	83
Talent management	4	18	3	75
Fleet management	–	–	7	93
Other**	15	15	–	70

*Percentages refer only to companies whose shared services cover the functions

**Other functions included: communications, customer service, sales, engineering, environmental health and safety, regulatory affairs, and analytical sciences

Source: Powell (2004).

Advantages of Shared-Service Centers for HR Administration

Advantages of SSCs for HR administration (Boglind, Hallsten, & Thilander, 2011; Robinson & Robinson, 2005; Ulrich, 1997; Walker, 2001) include (1) permitting HR administration managers to focus on delivering the timely, high-quality transactions necessary to fulfill corporate requirements, such as mandated governmental reporting, and (2) removing the artificial barriers inherent in the generalist-specialist continuum common in HR organizations, smoothing work and communication processes. This is particularly important for multinationals, which have to respond to the labor laws of multiple countries.

Combining such transactional responsibilities into a single business unit encourages the unit to focus on customer satisfaction with specific user interactions, such as responses to employee questions or requests for assistance. This frees specialists to focus on more strategic activities. SSCs also encourage the efficiency and standardization necessary to support strategic cost-control goals by consolidating individuals responsible for transactions, providing organizations with greater motivation to redesign procedures and create more effective ones. Finally, such centers facilitate development of the measures of efficiency, quality, and customer responsiveness that are necessary to demonstrate appropriate contributions to strategic goals. However, there are several potential pitfalls associated with SSCs.

Disadvantages of Shared-Service Centers for HR Managers

Frequently, organizations combine multiple, unrelated shared services into a combined business unit. Depending on the nature of such functions, the synergies needed to consolidate and improve processes may be less prevalent. For example, combining vehicle fleet management and HR transactions may offer few synergies. Leaders of such units may be stretched as they seek to unify and manage diverse functions. However, careful development of the mission and appropriate selection of the leaders of such units can overcome this problem by establishing a shared mindset among those involved (Walker, 2001).

In addition, creating SSCs may lead to unanticipated power shifts in organizations. For example, combining financial and HR transactions in a single center may lead to reduced emphasis on HR transactions since business managers are especially concerned with the budget reporting associated with financial transactions. Again, establishing an effective mission and overarching goals for the center can forestall such power shifts (Cooke, 2006; Ulrich, 1997).

Finally, SSCs can lead to depersonalization. For example, line managers, accustomed to personal contact with HR professionals, may feel isolated when handling transactions through self-service portals. Similarly, they may feel abandoned when traditional communication patterns are disrupted because specialists have been consolidated in SSCs. Because such units are concerned with efficiency and cost controls, individuals working in them can become more involved with the technology with which they work and less involved with others who are engaged in the day-to-day aspects of the business (Ulrich, 1997).

Outsourcing and HRIS

The third approach to HR administration, outsourcing, is the practice of contracting with vendors to perform one or more HR services and activities. This has been described as the HR version of the make-buy decision described above (Greer, Youngblood, & Gray, 1999). In organizations where strategic human capital management is practiced, outsourcing is a strategic decision made by senior executives, including HRM leaders. Where human capital management is viewed as primarily administrative, HRM leaders may not be included in outsourcing decisions (Delmotte, 2008; Seth & Sethi, 2011). Outsourcing is not new in HR administration. For example, Automatic Data Processing, Inc. (ADP) moved quickly in 1945 to offer its expertise in payroll and tax calculations to businesses facing increasingly complex employee income tax and withholding calculations (Dominguez, 2006). Nonetheless, few would have predicted the recent explosion in specialized organizations capable of providing a few or all of an organization’s HR functions (Hewitt, 2005). According to the 2012 KPMG Institutes’ outsourcing survey, 31% of participating global firms viewed HR as a top functional area for outsourcing. In addition, 40% of those surveyed were in

the process of coordinating new global sources for outsourcing some HR functions (KPMG Institutes, 2012).

HRO firms are hardly uniform. There are many different types of providers, reflecting the diverse needs of organizations. HRO firms provided HR services for 3.3 million employees in North America (Everest Group, 2016). For example, the Everest Group has identified 11 providers who specialize in one of the fastest growing HRO specialties: benefits administration outsourcing (BAO). Preeminent firms (e.g., ADP, Bswift, Businesssolver, and Willis Towers Watson) are leaders in BAO both domestically and globally, representing 75% of the market.

Outsourcing contracts should include specific pricing agreements (e.g., flat or fixed fee per process or per employee served, unit prices per transaction levels, hourly and overtime rates, revenue sharing, risk-reward sharing, failure penalties), expected performance and associated measures (e.g., transaction quality standards, error rates, system availability and downtime, customer satisfaction levels, hours of operation), and terms and conditions (e.g., start and end dates, extensions permitted, termination agreements, dispute resolution procedures, audit procedures). Obviously, HR administration managers would require significant assistance from multiple groups such as the legal, operations, and information systems departments within the organization to establish and monitor the contract, ensuring that the organization is adequately protected from incompetent or unethical outsourcing providers.

Reasons to Pursue HR Outsourcing

HR administration managers elect to pursue HRO for multiple reasons (Keebler, 2001). Weatherly (2005) suggests that managers may pursue discrete, multiprocess, or total-process HRO. Some organizations outsource only discrete or selected functions, pursuing **discrete HRO** through niche third-party providers. This outsourcing involves having specialized external firms deal only with a particular HR function. External HR recruiting firms, for example, fall into this category. Such an approach is common in smaller organizations with limited numbers of HR professionals or in larger organizations with few, sporadic recruiting requirements. Also included in

this category is the outsourcing of parts of various HR functions. For example, even organizations with large, effective recruiting staffs may elect to outsource executive or specialty recruitment functions (e.g., recruiting for multilingual positions) to external search firms that have unique expertise. Similarly, organizations may outsource only annual benefits enrollment, flexible spending accounts (FSA) administration, or payroll administration.

Generally, the outsourcing of discrete HR functions is attractive for two reasons. First, discrete HRO can achieve cost savings by eliminating the company's need to hire highly specialized HR professionals (e.g., executive recruiters) or those with the HRIS expertise necessary to perform infrequent functions (e.g., FSA administration). In addition, discrete HRO can reduce the HR administration costs associated with frequent, high-volume transactions such as payroll. In both cases, discrete HRO serves to reduce HRIS expenses and the number of HR employees, while ensuring the desired strategic outcome of hiring the right executive or paying employees correctly on schedule. Although discrete tactical HRO has existed for many years, it still remains a popular HR administration approach for achieving strategic goals.

HR administration managers may also pursue **multiprocess HRO**, also known as *comprehensive* or *blended services outsourcing.* This approach involves outsourcing to niche, third-party providers all of one or more related HR functions, for example, recruitment and selection or defined and 401(k) retirement plan administration. Multiprocess outsourcing has become more popular with the increase in the number of specialized vendors providing such services and the spread of enabling Internet portal capabilities. With an HR portal and HRIS, employees can model their pension decisions independently (to determine pension amounts associated with different retirement dates, for example) and then change 401(k) investment directions by speaking to pension specialists at the third-party vendor when questions arise. This outsourcing of sets of functions reduces the number of specialized HR employees, improves service levels to employees, and reduces HRIS hardware and software upgrades and ongoing maintenance costs. Overall, such an HR administration approach can provide significant cost reductions and simultaneously maintain or enhance service levels.

Total HRO is the third type of outsourcing approach and involves having all, or nearly all, HR functions handled by one or more external vendors. All traditional HR administrative and functional activities would be managed through third-party vendors. For example, Johnson & Johnson Inc. contracted with Convergys to provide full HR administrative and transactional services for its global workforce for $1 billion (CBR, 2007). Under such arrangements, employees would contact the vendor for assistance or inquiries directly, without any company HR employee involvement or knowledge. Certainly, such a plan would reduce internal HR employee expenses, HRIS expenditures, and administration costs dramatically; however, such savings would be offset by costs for vendor contract administration, quality controls, and oversight. In addition, the HR strategic functions, such as long-term force planning and strategic business unit support, should not be outsourced because third-party vendors frequently deal with multiple clients, one or more of whom might be competitors. It is not hard to imagine how even the most sincere vendor efforts to secure strategic HR plans might be inadvertently compromised, leading to disclosure of these plans and severe strategic disadvantages. Although this HR administration approach is not as prevalent as either discrete or multiprocess outsourcing, it is gaining in popularity. Organizations might opt for such a total HRO solution to deal with the myriad HR requirements associated with the global workforce of an MNE, to focus on HR strategic issues, or to reduce costs. That this strategy is gaining support is demonstrated in Hewitt's (2010): HRO survey 82% of surveyed companies rated their outsourcing as effective or highly effective in meeting strategic goals.

Advantages of HR Outsourcing

The advantages of HR administration outsourcing can be both financial and strategic (Keebler, 2001; Weatherly, 2005). For example, organizations seeking to increase financial profitability and enhance shareowner value might employ HRO to reduce ongoing expenses for employees and software, forestalling capital expenditures for new buildings and equipment. This decision would entail a careful "make-buy" assessment of the total costs and benefits of continuing internal operations versus contracting for them in the external market. Benefits of such an approach might include redesigned processes, improved quality, centralized or consolidated operations, access to

technology, and enhanced employee satisfaction. The cost-benefit analysis (CBA) approach covered in Chapter 7 would be essential in this situation.

The strategic advantages of HRO might include the ability of the organization to better focus on its core business by transforming the HR function. By outsourcing the simpler, transaction-based function, the HR department can move from its historical focus on administrative activities to a new position as strategic business partner. Organizations recognize that, more than ever, effective talent management may be the source of sustainable strategic advantage in a knowledge-based, global economy. However, many HR professionals are mired in day-to-day transactional administrative tasks that preclude the value-added consulting, planning, and visioning activities required from them to achieve strategic goals (Fletcher, 2005; Lawler, 2005). HRO could free HR professionals to focus on strategic issues, such as talent management, while providing the firm with skilled transactional and professional services in HR functional areas such as compensation and in administrative areas such as governmental compliance and regulations. Moreover, these services would be powered by the up-to-date technology provided by the external vendor.

Disadvantages of HR Outsourcing

Although there are a number of financial and strategic reasons for considering HR administration outsourcing, there are also serious potential problems for firms that use the approach without fully understanding how to manage it to achieve desired goals. For example, firms that used HRO to achieve HR transformation and cost savings rated their success at an average of 3 on a 5-point scale (1 equaling *benefits not at all achieved* and 5 equaling *benefits fully achieved*) (EquaTerra, 2007). Thus, one big disadvantage of HRO is the likelihood that the organization will *not* achieve its strategic goals. Such a failure could have a significant, negative impact on the organization's ability to survive. Steps to minimize such a failure include realistic cost-benefit analyses (see Chapter 7), successful change management (see Chapter 6), unambiguous goals and measures of HRO success, rigorous vendor assessment and selection processes, and skilled vendor contract negotiation, management, and auditing (Weatherly, 2005). Indeed, one of the primary responsibilities of HR administration managers in an outsourcing

environment is to ensure that the contract terms are fulfilled on a daily basis and that corrective actions are immediately taken when failures occur.

Another disadvantage of HRO includes the loss of institutional expertise in the outsourced functions, making an HRO decision reversal difficult or impossible. Frequently, when outsourcing is undertaken, HR subject matter experts are reassigned or released. This restructuring can be a serious strategic error if the vendor is unable to fulfill its contractual obligations. As noted above, an organization would be unwise to outsource core or strategic HR planning functions because of the possibility that competitors might learn its plans from vendors. In addition, loss of internal strategic HR expertise may be devastating to an organization over time. Unfortunately, these outsourcing organizations may lack the contract management expertise to oversee the vendor and hold it accountable for contract terms. Other potential problems include security risks in multivendor outsourcing, internal employee and manager resistance, compliance failures, and cultural clashes between the organization and its vendors.

As outsourcing arrangements continue to increase, evidence from information technology (IT) outsourcing can provide a cautionary tale for those considering HRO. For example, in a recent study, approximately one-third of organizations reported that they had canceled an IT outsourcing contract (Lacity & Willcocks, 2001). In addition, when these contracts are canceled, the functionality is often brought back in-house instead of shifted to a new outsourcing partner (Lacity & Willcocks, 2000). The effort to bring functionality back in-house, also known as **backsourcing**, can be expensive, as firms pay to reorganize twice: first when outsourcing a function and again when it is backsourced.

In summary, HRO is another approach to HR administration that offers potential for cost reduction, process improvement, and employee satisfaction. However, managers of HR administrative functions must be highly skilled at using HRO strategically to achieve organizational goals.

Offshoring and HRIS

The final approach to HR administration, offshoring, is an expansion of HR

outsourcing that includes sending work outside the United States to vendors located in other countries. Technological capabilities and global competition have combined to make HRO a global business, and offshoring for MNEs is quite complex. For example, if an Australian airline has call centers in India to obtain improved cost performance, why not have its SSC for HR there as well? Based on responses from 5,231 executives in North America and Europe, Hatch (2004) reported that 19% of all companies and 95% of the *Fortune* 1000 companies considered offshore outsourcing. Moreover, there are now more than 10,000 offshore vendors in 175 countries competing for the business. Figure 8.5 shows the various reasons organizations consider offshoring.

Esen's (2004) survey of HR managers reported that organizations consider offshoring primarily for financial reasons, including lower labor costs (76%), increased profits (50%), and reduced health care costs (23%). For example, researchers found that labor costs for a software developer in India were $6 per hour as opposed to the $60 per hour earned for doing the same job in the United States (Chiamsiri, Bulusu, & Agarwal, 2005). In addition, some firms were seeking skilled employees (16%) or productivity (10%) and service improvement (7%). Only 7% considered offshoring for strategic reasons. In fact, 40% of HR managers reported that their organizations would not consider offshoring because it was inconsistent with strategic direction.

Types of HR Offshoring

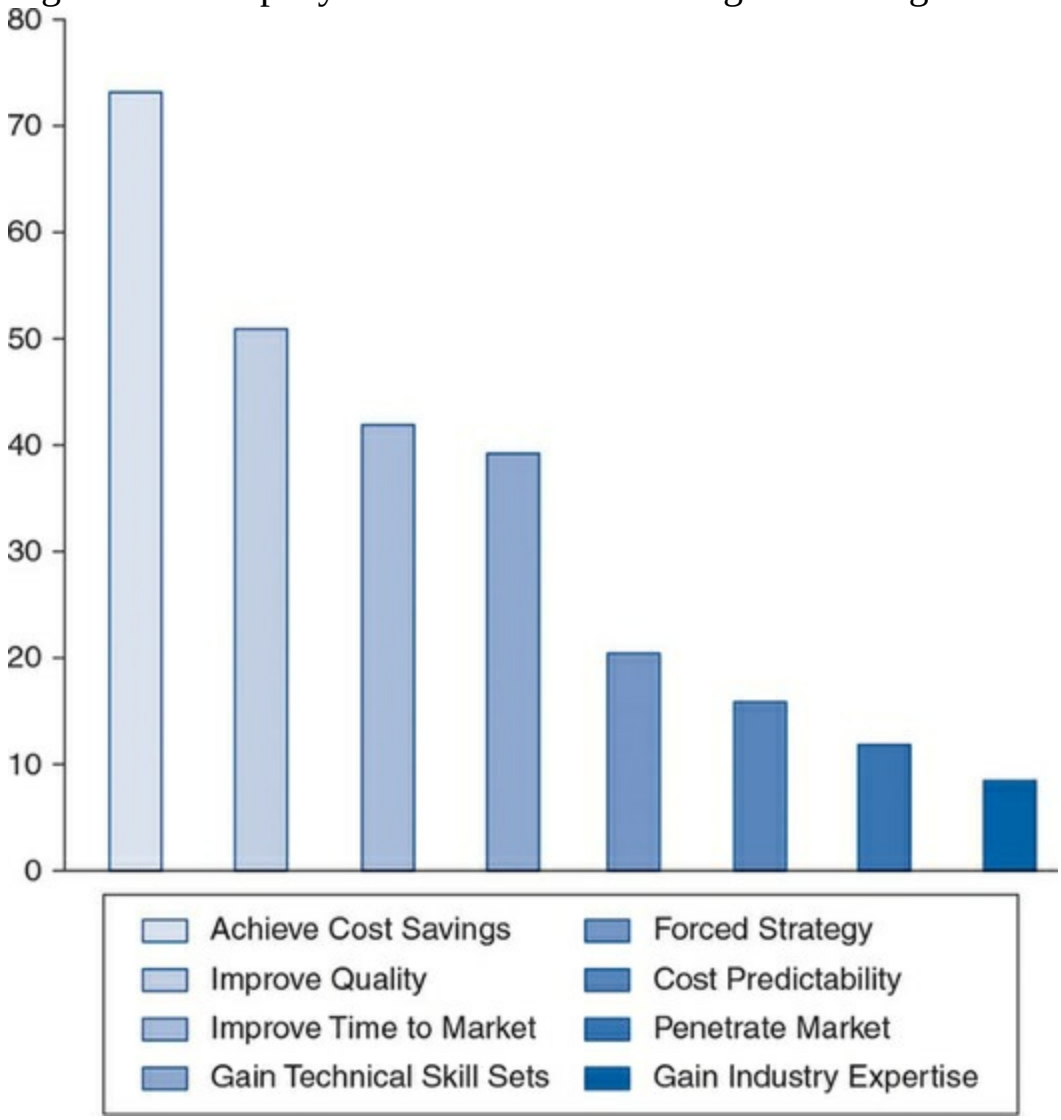
When their organizations pursued offshoring, HR managers reported that manufacturing functions were most common (43%), followed by IT (29%) and computer programming (22%), customer call centers (29%), and HR functions (16%). Such organizations used both offshore ownership and offshore outsourcing (Esen, 2004). **Offshore ownership** may include opening a new subsidiary in the foreign country, entering into a joint venture with an existing firm in that country, or purchasing an existing firm. By comparison, offshore outsourcing is a traditional contractual relationship with an existing firm.

Offshore ownership is riskier than simple offshore outsourcing. In addition to appropriate strategic and financial due diligence, organizations considering

offshore ownership must pay particular attention to

- ready availability of necessary employee knowledge, skills, and abilities such as language;
- information and communication systems compatibility with HRIS;
- government regulations and legal employment requirements such as wage laws;
- political stability of the country for facility and employee security; and
- cultural differences such as expectations about participative versus directive supervision.

Figure 8.5 Company Reasons for Considering Offshoring



Source: Hatch, P. (2004). http://www.ventoro.com.

Although an offshore outsourcing strategy is less risky than offshore ownership, organizations would still face more risk than they would had they outsourced domestically. HR managers should always perform due diligence in assessing the reputation and business capabilities of an outsourcing partner. However, such processes are more complex when dealing with organizations located halfway across the globe. For example, concerns about electrical power availability, which might determine whether HRIS processing can occur as scheduled, are rarely discussed with outsourcing firms in the United States but might be a significant issue in parts of Indonesia. In addition, worker availability to meet a 24/7 service center requirement is less of a problem in the United States than in countries where overtime is limited to a few hours per month, as it is in the European Union (EU). Finally, oversight and audit functions may be less onerous and expensive when U.S. companies establish offshore outsourcing agreements in nearby countries such as Canada or Mexico rather than in more distant nations such as India or China.

Summary of HR Administration Approaches

Based on the previous discussion, it is clear that HR administration managers have a number of approaches that can contribute to the goals of reducing costs, improving efficiency, and increasing service levels for internal customers. It is also important that such alternatives be pursued consistent with each organization's strategic plan to achieve sustainable competitive advantage in its industry. Multiple approaches may be appropriate based on those strategic goals. For example, HR portals may be combined with SSCs and selective outsourcing or offshoring to achieve the optimum solution for a particular firm.

In assessing whether one or more approaches is best, HR administration managers must understand the impact of their decisions on the specific administrative functions to be accomplished. Therefore, the next section describes two specific U.S. government reporting mandates (i.e., to the Equal Employment Opportunity Commission [EEOC] and OSHA) that are included

among the many HR transactions for which HR administration is responsible. Following a discussion of the governmental mandates, their legal underpinnings, and the actual reports and records maintenance required, we explore how HR administration approaches can facilitate improved accuracy, reduced costs, and increased organizational value during the process of successfully completing such HR transactions.

Legal Compliance and HR Administration

As noted in Chapter 1, the country and its general environment constitute a major effect on HRM and on the development and implementation of HRIS (Beaman, 2002). Whether the organization pursues a “domestic only” strategy (i.e., doing business in only one country) or an MNE approach, countries’ government and labor laws are important external forces in establishing the context for business (Hersch, 1991). In particular, the labor laws provide the foundation of employee protections in the workplace. For example, in the United States, the Constitution and its Amendments establish the rights of citizens in general. In addition, multiple employment laws have been passed by the U.S. Congress to complement those rights. Some of the more important of these U.S. employment laws are identified in the glossary provided at the end of the book. For a more detailed discussion of the employment laws in the United States, see Ledvinka (1982).

It is important to recognize that U.S. employment laws underpin the *general principles* used in the practice of HRM. There are a number of laws in the United States prohibiting unfair discrimination on the basis of employee sex, race, age, and disability. There are similar laws and regulations in other industrialized nations that prohibit unfair discrimination (Briscoe & Schuler, 2004). The general principle underlying these unfair discrimination laws and regulations is that job performance should be the primary basis for employment decisions that change the employment status of an individual. When hiring new employees, for example, a company should base its hiring decision primarily on expected job performance, which might be assessed through employment tests and interviews. Whether applicants are male or female is irrelevant in all but a few cases (e.g., restroom attendant). Similarly, decisions to award a pay raise, or to promote or terminate an employee, should be based on the employee’s job performance. As noted, the general

principles underlying employment laws in the United States bear significant similarities to the general principles underlying employment laws or regulations in other countries, such as those specified in the EU directives (Briscoe & Schuler, 2004; Dowling & Welch, 2005; Paskoff, 2003). Since compliance with employment laws and regulations is a critical part of HR administration, provisions for handling the employment laws of multiple countries need to be considered in the development of an HRIS for a multinational firm.

What complicates U.S. employment laws for HR professionals is that the 50 states frequently expand on, adopt rules and regulations that differ from, or add additional protections not covered by federal law. For example, a partial comparison of elements of the **Family and Medical Leave Act (FMLA)** with the federal and state legislation of California and Oregon demonstrates these variations. Both California and Oregon deviate from the federal FMLA statute, but do so in different ways. The federal law specifies that its provisions apply to private employers with 50 or more employees in at least 20 weeks of the current or preceding year (U.S. Department of Labor, 2007). California law applies the provisions of the FMLA to *all* employers with 50 or more employees. In contrast, Oregon applies the provisions of the FMLA to employers with 25 or more employees in at least 20 weeks of the year. In this case, HR managers operating in both California and Oregon would be required to provide annual reports demonstrating that they have complied with both the federal and the state laws that are applicable. Since country-level and local laws can differ for all nations, administrative expenses to comply with employment laws can mushroom for firms with national and international exposure, even when an HRIS is used to support such compliance requirements. Indeed, this example reinforces the need for flexibility in HRIS software to accommodate such reporting differences.

This is, of course, just one example among many that demonstrates how governments affect HR administration. There are many laws and regulations in the United States that require organizations to report to government agencies (Ledvinka, 1982). All these manual reports are tedious and time-consuming, and they account for a significant amount of the transactional activity of the HR department. The processing for these activities was affected significantly by the introduction of computer technology and has

always been a part of any integrated HR software package. The next sections take an in-depth look at two U.S. government mandates associated with equal employment opportunity (EEO) and employee safety. Specifically, HR administration and related concerns associated with EEO records and reporting (EEO-1 report) and OSHA record keeping and reporting will be highlighted. As you read about the reporting requirements of these laws, just imagine the tremendous amount of time it would take to complete an EEO-1 report manually for a medium-sized company of 1,000 employees; that is a considerable amount of "paper shuffling." Again, it is important to recognize that the following discussion is illustrative of HR administration, employment laws, and the use of an HRIS and, thus, could be applied to any country in the world.

HR Administration and Equal Employment Opportunity

U.S. Civil Rights Act of 1964, Title VII, and the EEO-1 Report

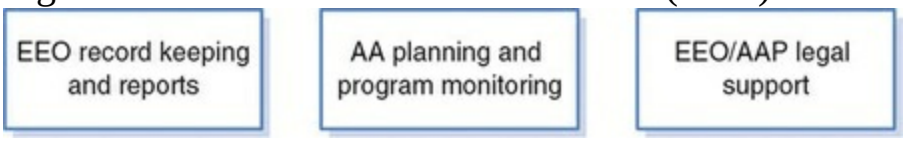
Figure 8.6 displays the broad categories of HRM administration associated with governmental mandates for meeting the requirements of **equal employment opportunity (EEO)** and affirmative action laws and guidelines. That all individuals should be considered for employment based on knowledge, skills, and abilities rather than irrelevant factors (e.g., sex, race, religion) is the *general principle* of EEO. Title VII of the Civil Rights Act of 1964 provides the requirements for such EEO. Under Section 703 of Title VII (42 U.S.C. §2000e-2), it is illegal for employers with 15 or more employees working 20 or more weeks per year

> (1) to fail or refuse to hire or discharge any individual with respect to his compensation, terms, conditions, or privileges of employment because of such individual's race, color, religion, sex, or national origin, or
>
> (2) to limit, segregate, or classify his employees or applicants for

> employment in any way that would deprive or tend to deprive any individual of employment opportunities or otherwise adversely affect his status as an employee because of such individual's race, color, religion, sex, or national origin. (U.S. EEOC, 1964)

In addition, employers who engage in business with the federal government and have contracts valued at $50,000 or more must comply with additional requirements that include providing a written **affirmative action plan (AAP)** to the Office of Federal Contract Compliance Procedures (OFCCP). This report details how the employer is actively seeking to hire and promote individuals in protected classes. Specifically, the AAP must (1) provide a detailed comparison of the available labor force with the employer's workforce by race, color, religion, national origin, and sex; (2) specify goals and timetables for achieving workforce balance if underutilization exists; and (3) indicate the specific steps to be taken to attain the goals in order to erase underutilization. In 1967, Congress expanded protection against illegal discrimination in employment by including the age criterion (i.e., persons aged 40 or older) with the passage of the **Age Discrimination in Employment Act (ADEA)**, and in 1990, it provided protection to individuals with disabilities with its passage of the Americans with Disabilities Act (ADA). One example of the many mandated government reports is the EEO-1 report.

Figure 8.6 EEO/Affirmative Action Plan (AAP) Administrative Functions



EEO-1 Report (Standard Form 100)

To monitor and assess equal employment opportunity practices, the EEOC was charged with gathering data, investigating alleged violations, and bringing legal charges against employers who failed to comply with Title VII requirements. Accordingly, all employers with 15 or more employees must keep records regarding their compliance with the law based on occupational category (i.e., professional, technical, managerial, craft) and sex and

race/ethnicity. Although the records historically included six EEO categories (i.e., white, black, Hispanic, Asian or Pacific Islander, Native American), changes in the number and designation of categories were made based on the 2000 U.S. Census, with reporting by the revised categories beginning in 2007.

A sample of the "Employment Data" section of the EEO-1 report (Standard Form 100) with its revised categories is shown in Figure 8.7. Substantial changes in the report include expanding occupational categories from 4 to 10 and, more important, allowing individuals to specify more than one race/ethnicity category. Previously, individuals were limited to a single designation. The EEO-1 report must be prepared each September 30 by

> all private employers . . . with 100 or more employees. . . . [M]ulti-establishment employers doing business at more than one establishment, must complete online: (1) a report covering the principal or headquarters office; (2) a separate report for each establishment employing 50 or more persons; and (3) a separate report . . . for each establishment employing fewer than 50 employees . . . showing the name, address and total employment for each establishment employing fewer than 50 persons . . . by race, sex, and job category. (U.S. EEOC, 2006)

Revised reporting instructions include definitions of the revised designated racial/ethnic categories shown below, columns for reporting individuals who specify more than one race/ethnicity, and strong encouragement to have employees "self-identify" rather than relying on the employer's visual categorization. The race and ethnic designations used by the EEOC are as follows:

- *Hispanic or Latino*—A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race.
- *White (not Hispanic or Latino)*—A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
- *Black or African American (not Hispanic or Latino)*—A person having origins in any of the black racial groups of Africa.

- *Native Hawaiian or Other Pacific Islander (not Hispanic or Latino)*—A person having origins in any of the peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- *Asian (not Hispanic or Latino)*—A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- *American Indian or Alaska Native (not Hispanic or Latino)*—A person having origins in any of the original peoples of North and South America (including Central America) and who maintain tribal affiliation or community attachment. (U.S. EEOC, 2006, Appendix 4)

EEO-1 and HRIS

Smith (2006) suggests that the recent changes to the EEOC guidelines will be the most sweeping change in the history of the EEOC, as workers reclassify themselves based on the new EEO designations and organizations pore through job descriptions to classify individuals into the new work categories. For example, individuals who classify themselves as white could also classify themselves as Asian under the new plan. Even small firms without an HRIS have a large amount of work to do. However, HRIS changes will be significant as well (Jossi, 2004). For example, human resource information systems and enterprise resource planning (ERP) systems have generally used a single field letter or number to represent race/ethnicity categories. Potential system changes required by the updated EEO-1 report include the following:

- Track race separately from ethnicity (e.g., Hispanic or not Hispanic)
- Provide separate codes for Asian and Native Hawaiian or Other Pacific Islander
- Modify limitations on reporting only one race (e.g., individual may be black and Asian)
- Ensure that queries can identify all individuals in a particular category (e.g., American Indian), even when individuals self-identify as two or more race categories

Figure 8.7 EEO-1 Report

Section D – EMPLOYMENT DATA

Employment at this establishment – Report all permanent full- and part-time employees including apprentices and on-the-job trainees unless specifically excluded as set forth in the instructions. Enter the appropriate figures on all lines and in all columns. Blank spaces will be considered as zeros.

	Number of Employees (Report employees in only one category)														
	Race/Ethnicity														
	Hispanic or Latino		Non-Hispanic or Latino												
			Male						Female						
Job Categories	Male	Female	White	Black or African American	Native Hawaiian or Other Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	White	Black or African American	Native Hawaiian or Other Pacific Islander	Asian	American Indian or Alaska Native	Two or More Races	Total Col A–N
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Executive/ Senior Level Officials and Managers 1.1															
First/Mid-Level Officials and Managers 1.2															
Professionals 2															
Technicians 3															
Sales Workers 4															
Administrative Support Workers 5															
Craft Workers 6															
Operatives 7															
Laborers and Helpers 8															
Service Workers 9															
TOTAL 10															
PREVIOUS YEAR TOTAL 11															

1. Date(s) of payroll period used: _____ (Omit on the Consolidated Report.)

O.M.B. No. 3046-0007
Revised 00/2006
Approval Expires 1/2009

Source: U.S. EEOC (2006).

Moreover, the EEOC is encouraging online reporting of the EEO-1 and, simultaneously, discouraging manual reporting (U.S. EEOC, 2006). Thus, in addition to generating direct costs associated with software modification, employee self-designation, and job reclassification, these policy changes also affect, albeit in a more subtle way, HRM administration. For example, if firms choose to use electronic reporting, they may also find that the costs associated with complying with legislation will be reduced. This detailed description of EEO-1 reporting is provided to facilitate an understanding of how complex HR administration can be. The point is that the amount of paperwork required for compliance with all federal and local employment laws and regulations would be overwhelming without an HRIS. The HRIS applications software helps greatly reduce this complexity. Nevertheless, no matter how sophisticated the HRIS and its reporting software, the employee and organizational data must *be entered accurately* into the system. HR professionals should familiarize themselves annually with changes in the reporting requirements through the EEOC website at

www.eeoc.gov/employers/eeo1survey/index.cfm.

To understand the complexity of governmental reporting requirements, let us examine a second example of how these affect HRM administration. Specifically, consider the necessity of reporting data to show compliance with the Occupational Safety and Health Act.

Occupational Safety and Health Act Record Keeping

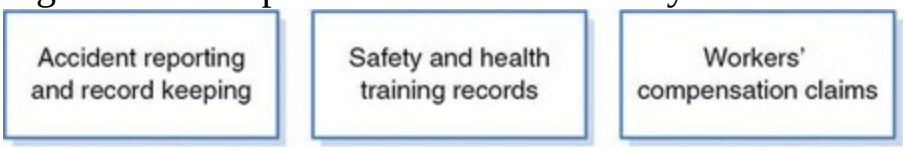
Figure 8.8 displays the broad categories of HRM administration associated with governmental mandates for safety requirements in OSHA. In 1970, with work-related fatalities reaching 15,000 annually, Congress charged the U.S. Department of Labor with responsibility for establishing, monitoring, and enforcing occupational safety and health standards and practices for firms engaged in interstate commerce. OSHA primarily established, in the general duty clause of the law, that employers must provide a workplace free of known hazards likely to cause death or serious injury. The National Institute for Occupational Safety and Health (NIOSH) researches and publishes safety and health standards under the law. To ensure that all businesses with 11 or more employees fulfill their occupational safety and health obligations, OSHA compliance officers typically arrive unannounced for an OSHA inspection. The inspector then proceeds to

- review employer records of workplace deaths, injuries, and illnesses;
- conduct on-site inspections of the work premise and note observed violations;
- conduct employee interviews to elicit any safety concerns; and
- discuss findings and violations or issue citations to the employer (Noe, Hollenbeck, Gerhart, & Wright, 2004).

Failing to correct violations or maintain required records could result in substantial fines and jail sentences for employers. For example, one of the worst U.S. mine disasters in 40 years occurred in 2010, when 29 miners died following an explosion at the Upper Big Branch-South mine in West Virginia. OSHA had issued 369 citations and orders prior to the disaster.

Massey Energy Company was fined $10.8 million following the disaster investigation and agreed to an additional $210 million in remedial safety measures (U.S. Department of Labor OSHA, 2011).

Figure 8.8 Occupational Health and Safety Administrative Functions



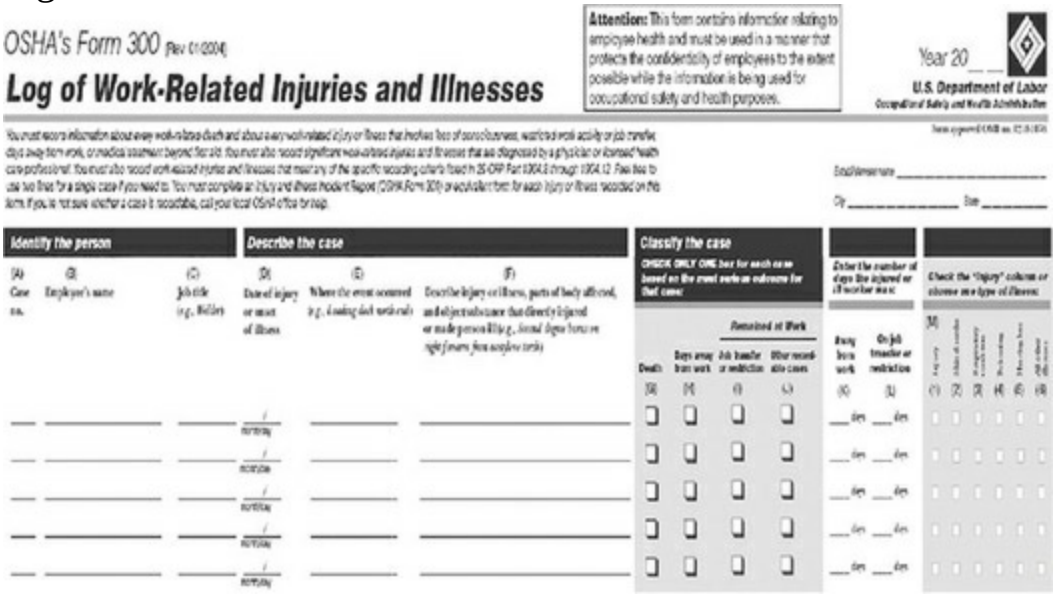
OSHA Form 300 (Log of Work-Related Injuries and Illnesses) and HRIS

All covered employers are required to notify OSHA within eight hours of any accident involving either a fatality or an inpatient hospitalization of three or more employees. In addition, all covered employers must complete an annual **OSHA Form 300** recording all reportable work-related injuries and illnesses. **OSHA Form 301** (Injury and Illness Incidence Report) is used to record supplementary information about reportable cases. Finally, **OSHA Form 300A** (Summary of Work-Related Injuries and Illnesses), which displays total injuries and illnesses for the year, must be posted for all employees to view. A sample of the Form 300 is shown in Figure 8.9. Regulations for OSHA administration are available at www.osha.gov/pls/publications/publication.AthruZ?pType=Industry&pID=152.

HR administration managers must be aware daily of any safety problems in order to meet OSHA Form 300 regulations and ensure that up-to-date records are available for OSHA inspections. Generally, details for the report must be obtained from the reporting supervisor involved in the reportable accident/illness investigation and recorded on OSHA Form 301. However, in smaller organizations, HR managers may be directly involved in accident/illness investigations. Reportable incidents are defined as work-related injuries and illnesses resulting in "death, days away from work, restricted work, transfer to another job, medical treatment beyond first aid, loss of consciousness, or diagnosis of a significant injury or illness" (U.S. Department of Labor, 2004). Because safety issues differ for different types

of businesses, the HRIS may not have a standard safety module. More likely, limited fields are added to permit tracking and facilitate federal and state reporting (Ceriello, 1991). However, including safety modules in HRIS can be beneficial. Desirable functions would include HR portal access at remote locations so that supervisors could enter accident/illness data, linkages to safety training and equipment records, and interfaces with required workers' compensation claims, in addition to record keeping and report generation. Such functionality can be an important part of an overall safety program as well as a means of increasing HRM administrative efficiency (O'Connell, 1995).

Figure 8.9 OSHA Form 300



OSHA's Form 300 (Rev 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20 __ __

U.S. Department of Labor

Occupational Safety and Health Administration

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restriction of work or motion, transfer to another job, medical treatment beyond first aid, or diagnosis of a significant injury or illness by a physician or other licensed health care professional. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the case				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:						
(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(E) Where the event occurred (e.g., Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g., Second degree burns on right forearm from acetylene torch)	CHECK ONLY ONE box for each case based on the most serious outcome for that case:				(G) Days away from work	(H) On job transfer or restriction	(M)						
						Death (J)	Days away from work (K)	Remained at Work: Job transfer or restriction (I)	Remained at Work: Other recordable cases (L)			(1) Injury	(2) Skin disorder	(3) Respiratory condition	(4) Poisoning	(5) Hearing loss	(6) All other illnesses
			/ mo/day			☐	☐	☐	☐	___ days	___ days							
			/ mo/day			☐	☐	☐	☐	___ days	___ days							
			/ mo/day			☐	☐	☐	☐	___ days	___ days							
			/ mo/day			☐	☐	☐	☐	___ days	___ days							
			/ mo/day			☐	☐	☐	☐	___ days	___ days							

Source: U.S. Department of Labor (2004).

Technology, HR Administration, and Mandated Governmental Reporting

Within the context of these complex legal requirements, what role can technology-enabled HR administration approaches have in increasing efficiency, quality, and cost reduction while enabling the fulfillment of mandated reporting? The answer to this question is especially important in

the area of equal employment opportunities and safety and health. Certainly, the increasing use of HRIS is essential for accurate, timely record keeping and reporting that facilitates the performance of both EEO and OSHA mandates. For example, accurate, timely completion of the EEO-1 reports presupposes ready access to employee records, where such information is maintained. For a smaller employer, paper records may suffice. For larger national or international employers with multiple locations, however, paper records are inadequate. Paper record keeping would require that each location search the records of each employee, manually record the appropriate information, and forward it to a centralized location for consolidation into the company report. For organizations with centralized HRM, either operations employees or managers would be required to do the report at each remote location. However, this waste of productive time is substantially reduced by the presence of an HRIS in the following ways:

- HRIS records can be established coincident with the employee application, including optional self-reporting of EEO race/ethnicity and sex data. No separate input functions are required unless corrections are needed. Self-reported data are likely to be more accurate and are preferred for compliance reporting.
- Simple queries of the HRIS database can secure required data, categorized by employee job classification, sex, and race/ethnicity in the EEO-1 format if desired.
- Required information for either EEO or OSHA reporting can be secured in minutes, with minimal HR employee involvement, rather than having staff take days or weeks to manually review records, compile the information, and forward it to a centralized location for further compilation.
- HR employees can handle the complete reporting function without interrupting productive time in operational units.
- Changes in mandated reporting requirements (e.g., an increase in the number of job classifications) can be handled mechanically by HR, without the involvement of field employees.
- Electronic reporting (i.e., computer to computer) can ensure timely receipt of reports.

If an ESS portal is available, government-mandated changes can be

accomplished more easily, even when individual employees must be involved. For example, HR administration managers can communicate directly with employees, explaining the changes in EEO categories and requesting that each employee update his or her information directly via the ESS portal. In addition, the rapid expansion of mobile applications which access the ESS and MSS portals can further enhance accuracy and reporting speed. Supervisors can be notified via the MSS portal of individual employees who have not updated their information, precluding meetings with all employees to introduce and monitor this type of change. Finally, if the employee refuses to update the information, the supervisor can use the MSS portal to enter the updated data directly.

If an SSC is added to the HR portal capabilities, individual employees with questions about the reporting requirements can contact the center directly for assistance. The supervisor need not be involved, and employees will receive rapid responses, which will allow them to complete the update more quickly and accurately. Thus, an HRIS, augmented by HR portals (i.e., ESS and MSS portals) and SSCs, can substantially improve the accuracy and timeliness of mandated governmental reporting, while reducing the hours wasted on routine administrative work, hours that could be spent more productively.

Similarly, HR portals, SSCs, and even outsourcing can facilitate OSHA record keeping and reporting, reducing costs and enhancing timely reporting. For example, HRIS records and MSS portals permit supervisors to complete the required record of a reportable accident electronically, filling out the Form 300A via computer terminal immediately after an accident occurs. In addition, updates can be handled with minimal effort. With appropriate linkages, workers' compensation reporting to state agencies can be generated by the system. If an employee files a workers' compensation claim and the company disagrees, HR administration managers can access the data and provide the rationale for disallowing the claim. If an organization outsources either workers' compensation reporting or accident investigation to third-party vendors, electronic linkages can notify those groups immediately so that appropriate procedures can be instituted. Finally, HR administration managers, without involving productive employees, can generate an accurate, up-to-date Form 300 whenever one is required for inspection, posting, or safety performance analysis.

Summary of Government-Mandated Reports and Privacy Requirements

The EEO-1 report and the OSHA Form 300 are only two of the many required administrative transactions for which HR managers are responsible. In addition, privacy laws add more complexity to the administration of the HR function via an HRIS. As noted, HRIS capabilities can be enhanced by the use of one or more HR administration approaches to improve accurate and timely reporting while reducing costs and increasing productivity. These examples demonstrate how effective HR administration can help organizations comply with government mandates while supporting strategic goals. The final HR administration issue included in this chapter is how, by using a balanced scorecard approach, HR managers can measure their activities in ways that demonstrate their contribution to an organization's strategic goals. Following a brief introduction of the use of a balanced scorecard in strategic management, we will examine which HR measures that are part of an HR administration can contribute to the balanced scorecard for an organization.

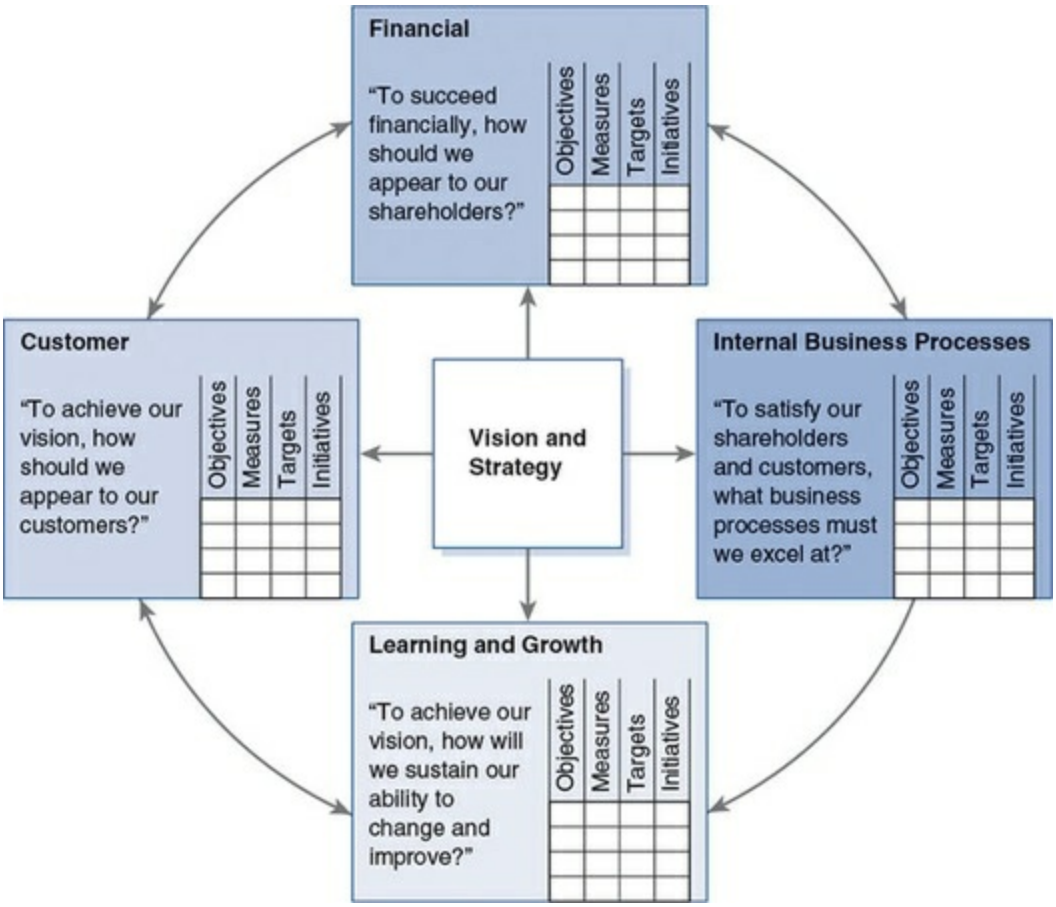
HR Strategic Goal Achievement and the Balanced Scorecard

As should be obvious from the topics covered thus far in this chapter, HR administration is crucial to effective HRM functioning. As discussed in Chapter 1, the HR department has historically been seen as performing a "paper-pusher" function in organizations and has been thought of as a cost-only operation. One of the major reasons for this situation was that the HR department could not easily or accurately generate metrics describing its operations and programs. The paper system existed, but it was exceedingly difficult to extract HR metrics (especially the metrics described in Chapter 14). Advances in computer technology, particularly those applicable to the HR function and its programs, made the calculation of these metrics possible. As a result, CBAs could also be calculated to evaluate the effectiveness of the HR department and its programs. The next step for HR was to become a part of the strategic management system in the organization.

The historic sequence and outcomes described in the previous paragraph depend on building an accurate, up-to-date database that is easy to access and manipulate. This is critical for all HR programs, and it all begins with a correctly designed HRIS that supports HR administration. The data from HR administration, particularly HR metrics (Chapter 14), are also used to support strategic goals, and one of the best examples of their use is in the balanced scorecard. Kaplan and Norton (1992, 1996, 2006), recognizing that an organization can no longer rely solely on a simple financial measure to assess its ability to achieve sustainable competitive advantage, devised the balanced scorecard to facilitate the organization's efforts to measure its success in achieving the strategic goals required to meet the needs of its stakeholder groups. A **balanced scorecard** is both a management and a measurement system that "enables organizations to clarify their vision and strategy and translate them into action, . . . [providing] feedback around both the internal business processes and external outcomes to continuously improve strategic performance and results" (Arveson, 1998).

Kaplan and Norton (1996) define the four components of the balanced scorecard as financial, customer, internal business processes, and learning and growth. Inclusion of these components represents an organization's commitment to balancing its strategic goals and reflects the expectations of its multiple stakeholders. An overview of all four components can be seen in Figure 8.10 along with the key question associated with each of the four.

Figure 8.10 Balanced Scorecard Components



Source: Arveson (1998).

HRM and the Balanced Scorecard

HRM is often not viewed as a strategic function in organizations primarily because its managers fail to develop measures demonstrating its strategic business value (Lawler, 2005; Ulrich, 1997). For example, successful HR administration efforts that ensure compliance with governmental mandates (e.g., EEO and OSHA reporting) are often viewed as simple administrative transactions rather than as strategic imperatives. However, failing to hire and retain the diverse workforce documented in EEO compliance reports can result in expensive lawsuits and reduced stock prices (Hersch, 1991), as well as in diminished firm credibility (Pomerenke, 1998) and decreased long-term innovation (Florida, 2002, 2005; Page, 2007). Each of these items is directly related to the balanced scorecard categories. Specifically, lawsuits and stock

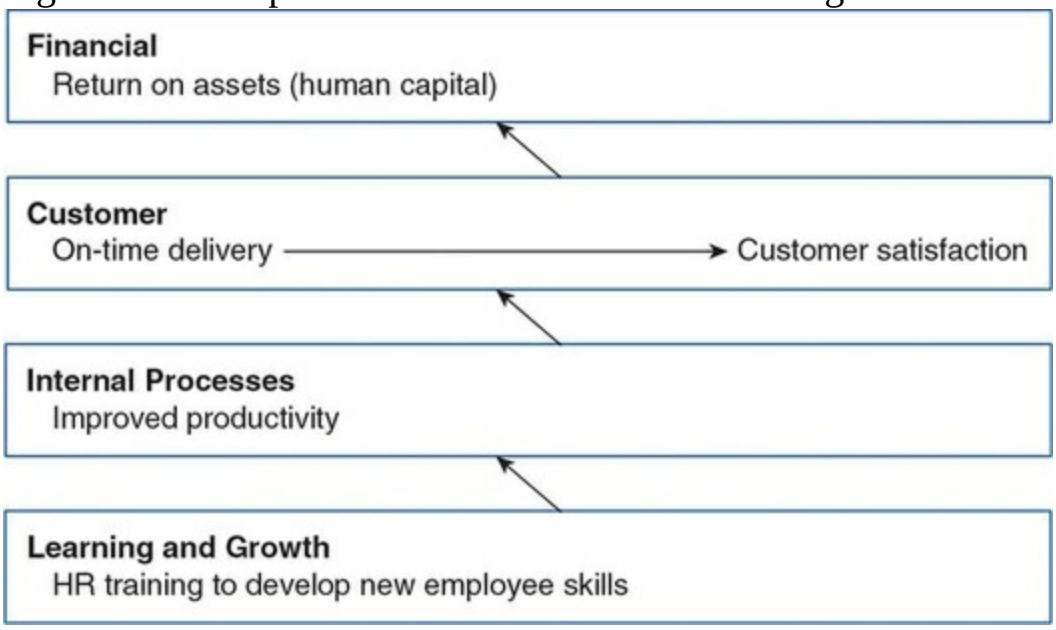
price are associated with financial success, reputation is associated with the customer category, and innovation is part of the learning and growth category. Certainly, HR professionals understand the impact effective human capital management has on an organization. However, unless measures to reflect the value-added nature of HRM in leveraging human capital are developed and linked to the strategic goals reflected in a firm's balanced scorecard, it is unlikely that organizations will view such HRM-linked activities as strategic.

Figure 8.11 provides a simple example of the linkage between HR functions and an organization's balanced scorecard. The next section will highlight the development of an HR scorecard.

HR Scorecard, Its Measures, and Its Alignment With the Organization's Balanced Scorecard

Suppose that the company is losing some customers, and analysis indicates that customer complaints spiked and on-time product delivery and new orders declined just before these losses. HR professionals want to identify the processes and measures that support the strategic goal of customer retention. The steps they might take are as follows:

Figure 8.11 Sample HR–Balanced Scorecard Linkages



1. Specify the business strategy to be supported (e.g., customer retention).
2. Identify leading (e.g., on-time order delivery) and lagging (e.g., customer satisfaction level) indicators.
3. Identify associated internal processes (e.g., worker productivity, product quality).
4. Identify HR linkages (e.g., training, rewards).
5. Specify the HR strategy (e.g., offer enhanced productivity training for workers to reduce product time to market and ensure on-time order delivery).
6. Measure worker productivity increase, on-time deliveries, and reduction in customer complaints to demonstrate the strategic value of HR training in the "Customer" and "Learning and Growth" balanced scorecard categories.

A leading indicator is a predictor of future outcomes (e.g., on-time order delivery), whereas a lagging indicator shows what has already occurred (e.g., customer satisfaction level). Thus, to ensure the on-time order delivery required to retain customers, HR professionals must understand the internal business processes involved in this retention and identify the HR function (training) that can be employed to improve these processes (i.e., to improve productivity) and increase the probability of the desired strategic outcome (customer retention).

HR Scorecard and Balanced Scorecard Alignment

Researchers have long recognized the need to ensure goal alignment in organizations (Beatty, Huselid, & Schneider, 2003; Becker & Gerhart, 1996; Becker, Huselid, & Ulrich, 2001; Lawler, 2005). For example, Boswell (2006) reported that employees who did not have "line of sight" between their work and the strategic goals of the organization were more likely to have poor work attitudes and consider leaving the organization. In addition, Decoene and Bruggerman (2006) reported that failure to implement the business scorecard properly (i.e., by neglecting to cascade strategic goals to all levels in the organization) reduced middle managers' motivation to support strategic goals such that the organization failed to achieve its strategic financial objectives.

In recognition of the importance of alignment between the organization's balanced scorecard and HRM strategic initiatives, researchers (Becker et al., 2001) have suggested that HR professionals develop an HR scorecard as a means of establishing measures for HR that reflect this alignment. HR measures should reflect a balance of cost controls (e.g., improved productivity) and value creation (e.g., increased innovation) consistent with the business's balanced scorecard and strategic goals. Figure 8.12 identifies sample HR measures that might be included in an HR scorecard (Becker et al., 2001).

From the previous discussion, we can see multiple opportunities for HR administration managers to align with the strategic goals covered by the balanced scorecard. For example, deploying HR portals (i.e., ESS and MSS portals) can provide simultaneous support for financial goals (e.g., cost control through reduced employee expense) and learning and growth (e.g., e-learning courses). Similarly, strategic use of outsourcing can support financial goals (e.g., cost reductions) and internal processes (e.g., improved time from vacancy request to hiring). Thus, HR administration managers can make decisions that support the strategic goals contained in the balanced scorecard.

Figure 8.12 Sample HR Scorecard Measures Linked to a Firm's Balanced Scorecard

HR functions to support Learning and Growth category (e.g., employee development)	• Backup talent ratio—Value Creation • Competency development expense per employee—Cost Control • No. of "special projects" for employee development—Value Creation • No. of employees with development plans—Cost Control
HR internal efficiency measures to support Financial category	• HR departmental expense/$ of sales revenue—Cost Control • HR sales training expense/$ of sales revenue—Value Creation • HR recruitment expense/R&D hires—Cost Control • No. of patents per R&D hire—Value Creation

Summary

One of the most basic features within an HRIS is the HR administration

module. HR administration allows organizations to streamline processes, increase service levels, and reduce costs. This chapter discussed the relative value of the HR administration module versus a traditional, “paper-and-pencil” approach to HR administration. In addition, the chapter discussed the various options available in the implementation of an HR administration module, including HR portals, shared services, outsourcing, and offshoring. Each of these approaches was considered in detail, and its advantages and disadvantages were outlined. The chapter also briefly discussed the flexibility that organizations have in implementing the HRIS. For example, HR portals may be combined with SSCs and selective outsourcing or offshoring to achieve the optimum solution for a particular firm.

Before developing and implementing the HR administration module, the organization must have conducted a basic job analysis to determine the appropriate knowledge, skills, and abilities for each job. In addition, basic job descriptions for each job should be developed. The data from this analysis form the basis for the data that are eventually entered into the HRIS. The chapter further discussed how human resource information systems can support organizations as they conduct a job analysis.

One of the key issues in implementing the HR administration module is to ensure that it meets legal and compliance requirements. This chapter discussed two specific U.S. governmental reporting mandates (i.e., EEO and OSHA reporting) as well as how an HRIS can facilitate improved accuracy, reduced costs, and increased organizational value by successfully completing such HR transactions. Even though the topic was a theme throughout the chapter, privacy, as this requirement relates to legislation and data security, was discussed in a separate section, which also presented a discussion of privacy laws and their consideration when one develops an HRIS. Finally, the chapter closed with a brief investigation of the elements important to the successful measurement of the strategic alignment of the HR balanced scorecard.

Key Terms

Discussion Questions

1. Discuss the theoretical bases for the four HR administrative approaches

introduced in this chapter. Are such theories useful to HR professionals in their efforts to improve transactional performance? Why or why not?
2. Why is service-oriented architecture enhanced by XML important to HR administration? Choose two HR administrative approaches, and discuss how each is facilitated by this architecture.
3. What are the primary advantages of HR portals and shared-services centers? Give examples of how HR professionals might use each to better achieve cost controls and service enhancement.
4. What are the primary purposes of ESS and MSS? What are the advantages and disadvantages of each?
5. Define outsourcing and offshoring. Compare and contrast the two as HR administrative tools. Give examples of the decision factors to consider when choosing one over the other.
6. Using the EEO-1 report as an example, discuss the purpose of government mandates. Give examples of penalties that organizations incur when they fail to comply with government mandates such as EEO and OSHA reporting.
7. Based on information in this chapter, recommend the most effective HR administrative approach or approaches for the owner of a small business with fewer than 50 employees and infrequent staffing needs. Would what you recommend work for a business with 5,000 employees and high turnover? Why or why not? Defend your position with information from the chapter.
8. Identify and explain the purpose of each of the four perspectives included in the balanced scorecard. Give two examples of HR measures for each of the four areas that would demonstrate the value of HR in achieving the strategic goals of organizations.
9. Return to the vignette that opened this chapter and answer the questions posed there.

Case Study: Talent Management at CalleetaCO

Jan Samson, CEO at CalleetaCO, sat staring at the now-empty boardroom. Her board of directors had reacted negatively to Jan's growth proposals for expanding CalleetaCO globally, leaving Jan with a big problem. Shareholders, who had bought its stock as the radio frequency identification (RFID) manufacturer led the boom in new uses for its products, were restless

as financial returns slowed. In addition, board members expressed concern that CalleetaCO plants in Mexico and Vietnam were becoming the targets of activists who advocated that organizations ensure that the humane working conditions common in the United States be established in American-owned offshore facilities. Finally, board members demanded that Jan move immediately to rein in the employee costs of the U.S. operation. Those costs were growing at a rate of 12% annually, compared with an industry average of 4%. HR Vice President John Nosmas defended his practice of hiring the best, paying them well, and providing them with expensive benefit programs to keep them developing the innovative products the market demanded. However, board members were adamant and demanded a plan at the next meeting, only six weeks away.

CalleetaCO, with its current 1,900 employees spread across three countries (i.e., the United States—1,000, Mexico—200, Vietnam—700), had grown rapidly over its eight-year existence. Although it started as a small entrepreneurial company, CalleetaCO was now challenging the top providers in its industry as it pursued its goal—to become the global leader in RFID products. RFID use exploded after the introduction of memory for passive radio transponders, which led to the production of RFID tags, microchip field radios embedded in products and used for electronic inventory. These tags were replacing traditional bar codes and manual scanning.

Electronic product coding associated with RFID has been embraced by retailers and consumers alike. Retailers such as Gillette, Hewlett-Packard, and Walmart benefit through more rapid restocking, less likelihood of out-of-stock items, and the electronic identification of product expiration dates. In addition, consumers can more easily return purchases. Applications seem unending. Members of Congress have introduced legislation to track sales of tobacco products using RFID technology, for example. New U.S. passports contain RFID tags. “Swipeless” checkouts, RFID medical alert bracelets, and security identification wristbands are on the horizon. In addition, California is likely to use RFID to comply with the 2005 Real ID Act mandated by Congress (Billingsley, 2007). However, some groups are concerned that RFID proliferation could lead to the surreptitious tracking of an individual’s purchases and other privacy violations, especially since individuals may be unaware that their purchases include RFID devices. In addition, hackers may

be able to steal identity information by remotely scanning an individual's passport, credit card, or driver's license.

Jan's company had grown rapidly by perfecting several of these products. To keep the innovations coming, Jan and John Nosmas devised a human capital talent acquisition and retention plan to attract the most highly skilled individuals in the industry. The company had 25 HR recruiters focused solely on identifying potential employees, 17 selection specialists to test and interview them, and above-market compensation and benefits at its U.S. location to retain them: health, dental, and life insurance at no cost to the employee; six weeks of paid vacation annually; elder care; child care; onsite pet boarding; liberal performance bonuses; 401(k) matching at 10%; stock options; and onsite spa and exercise facilities. The programs had been incredibly successful in finding the right people to fuel the company's innovative products.

With the company's success had come an even larger HR department. For example, employees regularly stopped by the HR office to chat with their designated HR support representatives (there was one HR support representative for every 10 employees). The employees were thrilled with the personal service and responsiveness to inquiries on everything from health questions to veterinary referrals. Managers had access to their own HR support specialists, who handled everything from performance appraisals and salary increases to filling vacancy requests and overseeing employee discipline. When the company had formed an SSC for information technology and financial services, the HR department had balked at participating because employees were so satisfied with service levels, even though departmental costs were 20% higher than those of counterparts at competitor firms. The firm's HRIS remained under the control of HR information technology specialists in the department, and there seemed few reasons to pursue portals. However, employees who traveled to Mexico and Vietnam had begun to complain about their inability to access HR support specialists for needed information because of time differences. U.S. expatriate managers from CalleetaCO controlled employees from Mexico and Vietnam at the offshore locations. HRO firms had recently approached John about the possibility of purchasing or managing those locations, but John had not yet explored such a possibility.

Jan picked up the telephone to call John. She explained the problem and asked him to prepare a list of ideas that could help them both demonstrate how successful CalleetaCO's talent programs had been and meet the board's requirements for cost controls. Jan knew that she would need to get John to work miracles to help meet the board's demands. She didn't want to stop talent searches or above-average total compensation, but board members were unyielding. Unless Jan could develop a successful plan to slow employee expense growth, control the activist stakeholder groups, and ultimately improve earnings, she could easily become the ex-CEO.

Case Study Questions

1. What are the key business issues facing Jan?
2. In what ways are CalleetaCO's HR operations contributing to the company's success? How do these contributions support the company's strategic goals? What changes can John make in his HR operations to meet the board's demands?
3. Describe whether each of John's proposed changes will hinder or help CalleetaCO achieve sustainable competitive advantage? Which ones would you choose if you were in John's position? Defend your choices.
4. How would a balanced scorecard help Jan explain the value of her HR talent approach? Provide sample measures for each of the four categories that would support Jan in her presentation to the board.

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9 Talent Management

Kevin M. Johns

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Editors' Note

This chapter is the first of four chapters that broadly focus on the topic of talent management (TM). Talent management has become an extremely important strategic goal for organizations, both domestic and global ones. Talent management has also been called human capital management (HCM), which recognizes that TM involves the effective management of the human capital of any organization. Talent management has multiple meanings. However, all of these definitions recognize that, to gain competitive advantage in the marketplace, an organization's talent (i.e., its people) must be managed effectively. This management of people includes attracting, selecting, training, compensating, and retaining employees. However, the underlying requirement for talent management is forecasting the need for talented employees in terms of both numbers and skills, particularly the need for employees in leadership positions. In order to forecast these needs, the organization must have accurate information about the knowledge, skills, and abilities necessary for effective job performance, and these are identified through job analysis, as discussed thoroughly in Chapter 8. Thus, this chapter is focused on (1) managing talent, (2) forecasting future demand and supply of employees through human resource planning (HRP), and (3) understanding how an HRIS can assist both talent management and HRP. Chapter 10 will focus on recruiting and selecting employees with desired talent, Chapter 11 is concerned with improving talent through training and developing employees, and Chapter 12 deals with managing employees' talent through performance management and compensation practices.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the origin of talent management and how it fits within HRP, human capital management, workforce management, strategic HRM, and corporate strategy
- Discuss the evidence for the importance of TM in general and, specifically, in terms of the talent management life cycle
- Discuss the common attributes of talented individuals
- Discuss the steps in the development and use of an HRP program
- Explain the use of HRP in forecasting supply and demand of new employees
- Explain the importance of job analysis and job descriptions to talent management programs
- Identify and discuss the important HR metrics for the HRP program of a company
- Explain the difference between a long and short strategy for TM and why it is important
- Explain the contribution of a TM program to corporate strategy as well as the importance of an adaptable workforce
- Discuss the effects of corporate culture on the talent management program
- Discuss how the use of computer applications in an HRIS support the components of talent management as well as their use in setting performance goals and evaluating job performance
- Discuss how companies are using social networks to recruit talented individuals
- Explain the relationship between talent management and performance management and the need to show measurable results on a balanced scorecard
- Explain how workforce analytics are used in a TM program
- Explain how to measure the success of a TM program

HRIS In Action

Rudiger is sitting at his desk in his seventh-floor corner office in the city, gazing out over London and reflecting on life. At 43, he is at the top of his game. He has everything he could wish for—a lovely partner, a 4-year-old in a private nursery, a new executive house in the suburbs, a holiday home in southern Italy, and a remuneration package that's the envy of his peers and beyond anything his German immigrant parents could have imagined. But it hasn't been easy, oh no! Hard work, long hours, geographical moves every two or three years, and sacrifices in terms of his personal life.

But now he has a problem. Rudiger has just been appointed global head of People and Talent responsible for the future of 35,000 people worldwide, the bulk of whom are based in the United States, the United Kingdom, and Europe, and manufacturing is likely to relocate to China in the next two years, adding to his responsibilities. In his previous role, he was responsible for the United Kingdom and Northern Europe and had operational oversight for 11,000 people. An initial consideration of his responsibilities has identified a number of people issues for the next five years:

- recruiting and placing new employees in appropriate jobs as vacancies occur
- developing the skills of current and new employees in training programs
- retaining unique specialists in highly skilled roles

In addition, several other issues have been brought to his attention by the outgoing global head of People and Talent:

- Some of the brightest high performers and the most experienced midlevel managers appear to be leaving the company
- The general employee population is aging, and there will be a significant number of retirements over the next decade, which will require extensive replacements
- There is an aging senior directorship, most of who are looking toward early retirement.

Although he knows he has a problem, the main problem is that he does not have enough detailed information about the employees to know the scale of the problem. He wishes he could find a general framework in which to address these problems and issues, and he wants to be able to show how the

framework and programs he implements will impact on the “bottom line” of the organization.

Introduction

> *I hire people brighter than me, and I get out of their way.*
>
> —Lee Iacocca

When looking for a new job, don’t expect to get calls from “headhunters,” because that title is no longer appropriate. Today, recruiters identify themselves as either a talent acquisition specialist or, more simply, talent manager.

Talent management (TM) is not just a new title for the human resources (HR) professional who is the manager of new hiring at a company. The field of TM brings with it a new perspective that unifies recruiting, hiring, training, promoting, and retaining talented individuals who can contribute to the overall growth and competitive advantage of a company. Historically, the management of a company’s talent was primarily focused on hiring individuals who had good experience along with appropriate educational credentials—and then hoping they would fit. The concept of TM has transformed this approach. Just matching individual skills to specific job requirements is insufficient; TM requires an HRM plan that is a comprehensive program of using and developing the person’s knowledge, skills, and abilities. The outcome of a TM program nested within the human resources management (HRM) function is that individuals can become high-performing employees who can contribute to the effectiveness and profitability of the company.

Defining Talent Management

For the past 15 or 20 years, talent management has been defined in a number of ways. In general, TM refers to the process of hiring, socializing, developing, and retaining employees, while at the same time attracting highly

skilled individuals from the labor market. A detailed approach to defining talent management comes from an article by Lockwood (2006) that appeared in *HR Magazine:* "Talent management is the implementation of integrated strategies or systems designed to increase workplace productivity by developing improved processes for attracting, developing, retaining and utilizing people with the required skills and aptitude to meet current and future business needs" (p. 17). Take note that TM can be used on all job levels in a company, from unskilled workers to CEOs. For example, if there is a labor demand (e.g., skills, quantity) for lathe machine operators due to high turnover in this job, then the general process and software used to hire new lathe machine operators would be the same as for hiring senior management. Thus, no matter if a company is looking for operators of a lathe or a CEO, the steps in the TM life cycle are the same. However, even though the steps are the same, the actual processes e.g., recruiting, interviewing, selecting of finding the CEO versus operators of a lathe would be quite different. More recently, Larry Dunivan (2010) notes that

> talent management has become the call to action for a more consultative, knowledge-based role for Human Resources in overall business management. In other words, talent management from a technological perspective provides companies the opportunity to collect and leverage rich data about people to respond to business needs. (p. 14)

From an information systems perspective, the door has been opened to utilize technology to manage the employee life cycle from recruitment to retirement.

Importance of Talent Management

In a poll conducted by the **Society for Human Resource Management (SHRM)** titled "Challenges Facing Organizations and HR in the Next Ten Years," 449 HR professionals responded to questions asking them to describe the "top challenges that their organization and the HR profession will face during the next decade." Of these survey respondents, 72% were from U.S.-based companies and 28% from multinational organizations (SHRM, 2010). Responses to this question yielded the following results:

> Nearly half the respondents (47 percent) said that obtaining human capital and optimizing on human capital investments was the top investment challenge for businesses over the next 10 years. Slightly less than a third (29 percent) of the respondents listed “obtaining financial capital and optimizing capital investments” and 12 percent answered “obtaining intellectual capital and optimizing intellectual capital investments” as the top challenges. (p. 1)

Another question on the poll asked the respondents to list the tactics that they thought would be effective in meeting the HR challenges they would face over the next 10 years: “58 percent of the respondents listed providing flexibility to balance life and work as the top tactic to meet the challenge of attracting, retaining and rewarding the best people” (SHRM, p. 1).

In another survey conducted by CedarCrestone (2010), respondents were asked what HR computer-based application categories would have increased adoption and usage in the near future. The results indicate that “three application categories will grow 90% or more: talent management, social media, and workforce optimization, the latter of which includes workforce planning and workforce analytics [see Chapter 14]” (p. 9). In addition, respondents thought that more talent management automation was related to net income growth, sales growth, and more sales per employee for organizations with talent management applications.

The Talent Management Life Cycle

Today, organizations recognize that an important workforce issue is the lack of leadership capability. The most significant example of a lack of leadership comes from the 2008 financial crisis that has continued to cause global ripple effects. Greed and the pressures to show quarterly growth to investors led to risky investments and over-leveraging based upon the boom in housing.

But lack of leadership in companies today is not just tied to lack of experience or training. It also comes from (1) expanding too quickly into new markets or geographies, (2) the changing needs of the employees, and (3) the ongoing retirement of the “baby boomers.” A report by McKinsey and

Company (2001) stated that the United States was facing a long-term talent shortage as a result of retiring baby boomers. Since this report appeared, little has been done to solve this mass retirement problem. Thus, the first step in the talent management life cycle is to estimate the leadership demand for labor, that is, the number of new leaders needed to replace the retiring baby boomers. The second step is to estimate the supply of leaders available in both the labor market and internal to the company. Then the *difference* between the estimated supply and demand for new and potential leaders can be calculated. The final step is to use HR programs to change the *difference* so that *supply* and *demand* are equalized (e.g., hiring new leaders when needed). When the estimated supply and demand become different, the life cycle begins again.

It is interesting to note that the McKinsey report could not predict what would happen if there were a severe economic downturn. The economic downturn of 2008–2009 kept many baby boomers in the workforce. However, it is still inevitable: baby boomers will eventually leave. Figure 9.1 contains the results of a survey by Beaman (2011) that demonstrates the growth in computer applications among global companies. Beaman notes:

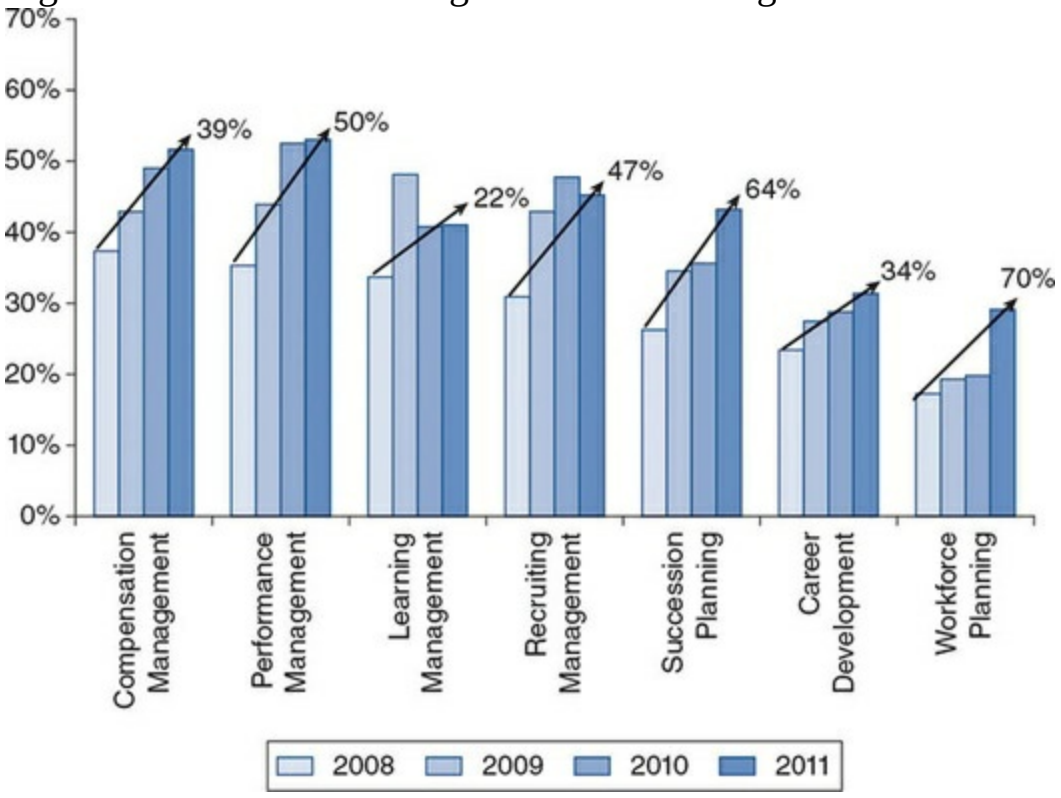
> However, when the demand for leaders exceeds the supply for leaders, it will be necessary for the company to either recruit new leaders from the labor market or promote current company employees to leadership positions.
>
> Talent Management technologies are globalizing at the fastest rate [of all HR technologies], 46% over the last four years, whereas Core HR and Payroll technologies are going global more slowly, at the rate of 23%. The fact that Talent Management software is more readily adopted globally can be attributed to the “low impact” legislative requirements with talent management functionality than are typically found with Core and Payroll processes. (p. 21)

In relation to the TM life cycle, an important aspect of Figure 9.1 is that each HR application represents an important part of the progression through TM process. For example, workforce planning, succession planning, and

recruiting management comprise the early stages of selecting individuals. The remaining four applications would occur while the individuals are going through the phases of the TM program.

Criticisms have come from unions and former employees who have lost their jobs; they claim that companies are replacing an aging workforce with less expensive overseas workers, that is, through outsourcing. As opposed to the claim made by critics of outsourcing, it is not a new idea, but questions must arise as to whether leadership skills are being substituted for something that costs less but may be producing questionable results. Attracting less talented and less expensive employees to replace departing employees who have leadership skills can erode an organization's future revenues. So it is very important to ensure that key leadership skills are being replaced either from within the company or from outside sources. Acquiring and growing a talented human capital workforce that adapts to the new challenges occasioned by changes in the marketplace is key to the **talent management life cycle** and, subsequently, to finding the leadership capabilities necessary to compete in the global economy.

Figure 9.1 Global Technologies—Talent Management



Source: Beaman (2012, p. 26). Reprinted with permission.

Attributes for Talent

The McKinsey report (2001) stated that talented employees who were “high performers” were 50%–100% more productive than employees who were “average performers”. During the downturn in the economy when forced layoffs have occurred, it is the talented performer that needs to be retained in the company. Job performance evaluations are a good method to determine employees’ efforts to be effective in their jobs, but evaluations are sometimes narrow and do not measure the employees’ potential for long-term success in an organization. The real measure for the long-term success of a talented individual is to evaluate the underlying attributes necessary for achievements.

There are many attributes from which to choose, and we will not try to identify and evaluate them for all employees in all job situations. Identifying the specific set of attributes that can lead to success in a job or business is difficult because no two individuals are alike, and attributes associated with the success of one individual may not apply to another. The best anyone can do is to choose the most likely attributes to measure people’s potential for future success, but, again, there are no guarantees. However, there are some core attributes that organizations should evaluate in regard to current employees or potential hires, such as honesty and integrity. Unfortunately, there are executives in business today whose honesty and integrity are questionable.

One effective method to measure what it takes to succeed in a particular job is to look at the job performance of past individuals who have succeeded in that position and identify the attributes possessed by those individuals. This methodology has been used for many years by HR recruiters and line managers to find the “right” person for the “right” job. An organization needs to ensure that the higher performers are retained to help maintain the company’s operations in case there are employee layoffs. Thus, it is important for the HR professionals and the executive management team to assess both employees’ potential individual job performance and their overall contribution to the whole company.

However, the question still remains as to what an organization should try to determine beyond core values or particular job skills for current employees or new hires. Although a complete list of the characteristics that make for success is impossible, the following appear to be the **common attributes of talented individuals:**

- *Ability to communicate with others using multiple media:* For example, communication could be by phone, presentation, or e-mail. An individual's ideas may be the best, but if she or he cannot communicate those ideas with clarity, then those ideas have no impact.
- *Drive:* Motivation plays a big role in determining who succeeds in any venture in life. Look at examples of people who constantly "reinvent" themselves, such as Arnold Schwarzenegger—bodybuilder to Hollywood actor to California governor.
- *Ability and willingness to listen to the ideas of others:* Listening is one of the most important ways of establishing good personal and business relationships.
- *Problem-solving skills:* Many tasks today in business deal with solving problems, whether that involves handling a small request by a client over the phone or closing the biggest acquisition deal in a company's history.
- *Imagination:* The closest version of the word "imagination" from a business perspective is when we are asked to think "outside the box."

The usefulness of the above attributes can be seen in numerous examples. If you have the ability to communicate and listen to others, you may be more likely to be a better team player and work effectively within teams. One reason to hire potentially talented employees may be based on their experience, for example, of running their own business—a venture for which initiative and drive are key success attributes. Being able to solve problems also relates to being willing to learn new things.

Imagination is an important attribute for people in business today. Albert Einstein once stated that the true sign of intelligence is not knowledge but imagination. How many companies today, in developing their talent, allow for a sabbatical from work so an employee can just take a break and think? Use of one's imagination is the mechanism for building a vision for a

business. Imagination is a key attribute for differentiating between talented individuals who can become future business leaders and those who will have difficulty succeeding.

Job Analysis and Human Resource Planning: Part of TM

Job Analysis

The introduction to this chapter discussed acquiring the most talented employees, such as skilled professionals and experienced managers; however, talent management comprises more than recruiting and so will be built on a program of human resource planning (HRP),[1] which is sometimes referred to as workforce management. HRP is closely related to strategic HRM (Chapman, 2009). The aim of an effective HRP program is to have the best available people working in the proper jobs at the appropriate time so that the organization maximizes its productive capacity. Fulfilling this goal means that future employee needs are forecasted accurately based on annual employee turnover and expected strategic directions. For example, if a strategic goal for a company is to increase market share by 3% over the next two years, this will affect the number of needed new employees in multiple job categories. With accurate estimates of employee turnover in those job categories added to the forecasted employee needs based on the strategic goal, the company can begin planning to recruit new employees as well as train current ones. In order to make these forecasts accurate, however, it is crucial that the knowledge, skills, and abilities (KSA) required in the forecasted jobs be known. As was covered in Chapter 8, job analysis provides this information by producing job descriptions. Job analysis is the process of systematically obtaining information about jobs by determining the duties, tasks, or activities of jobs from which KSA requirements can be estimated.

[1] Human resource planning is also referred to as workforce planning. The two terms are synonymous.

Human Resource Planning (HRP)

HRP begins with the identification of the strategic goals of the company and of how an HRP program can assist in achieving the effective use of the

human capital of the company. Organizations know that change is a constant in their business. It could be a change in competition, new markets, environmental concerns, or economic conditions. For example, a company may want to succeed under new competitive conditions by expanding its business into new geographic markets. A company may need to change its strategic vision, organizational values and structure, or corporate culture. When these types of changes occur, there must be corresponding changes in HRM programs, and one of the most important ones is the HRP program.

Changes in organizational strategy and business objectives focus attention on the use of the HRP program to estimate three factors related to an organization's employees:

- number of employees needed for growth or decline
- required competencies and behaviors of these employees
- required levels of productivity expected from these employees

This information is the primary input that starts the process of an HRP program. An HRP program involves three major processes and a number of actions within each process.

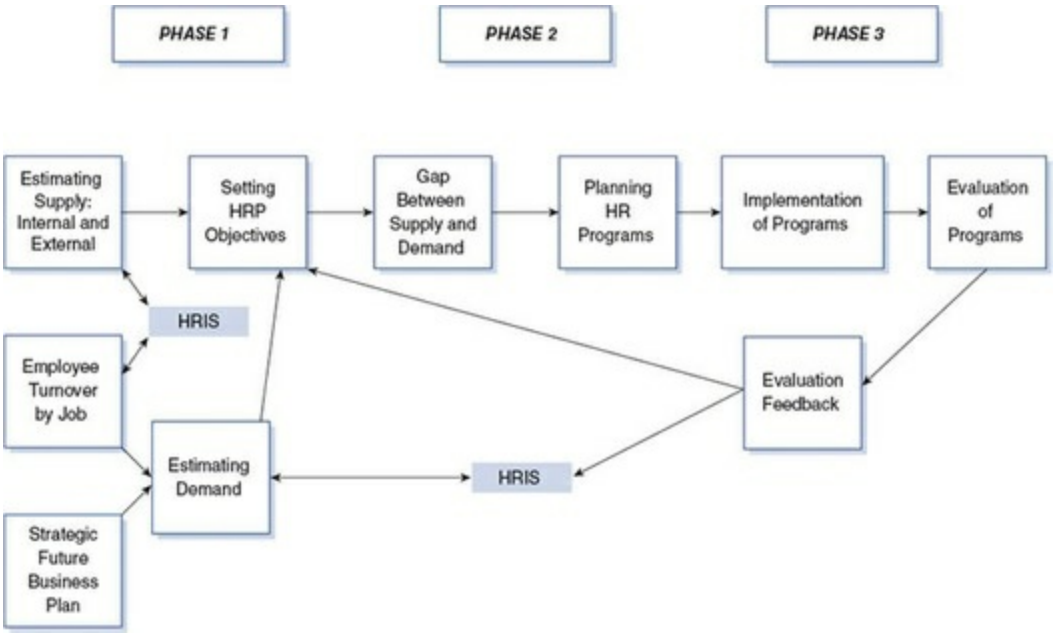
HRP Process Model

There have been a number of conceptual and descriptive models of the stages and processes involved in an HRP program. However, because of its simplicity, we favor the general three-phase model developed by Dyer (1982). In addition to being simple, this model can be used to implement the HRP program for all employees, sales associates to senior managers. In this model, the HRP program involves three major phases: (1) *setting HRP objectives,* (2) *planning HR programs,* and (3) *evaluation and control* (Dyer, 1982). Figure 9.2 depicts an expansion and modification of Dyer's model, and it provides greater specificity in terms of the activities that occur within the three phases. It is important to understand that HRP refers to all levels of jobs in a company, from janitor to CEO—these employees comprise the human resources of the company. The phase-specific activities in Figure 9.2 will be discussed in the following sections.

Phase 1: Setting HRP Objectives

Estimating Labor Demand. As can be seen in Figure 9.2, one of the first activities in phase 1 of the HRP process involves estimating demand for the total number of employees in a future business scenario. As an example, we will use a fictitious company that manufactures brake assemblies. The company has just had a very profitable year and currently has approximately 21% of the market for its products. The company's strategic planning committee has decided that a 2.5% increase in market share for the next fiscal year seems reasonable. This strategic statement comprises the "Strategic Future Business Plan," as seen in the lower left box in Figure 9.2, and is the first element in "estimating the human capital demand" for this company. The estimation of demand involves an examination of the history of the changes in numbers of employees by job when the company changed production levels in the past. This forecasted demand, then, is an estimate of the number of employees, by job category, needed to handle the 2.5% increase in market share, and it must be calculated by the HR department based on these historical records. Note the two-headed arrow from "Estimating Demand" to the human resource information system (HRIS) box. With the data from the historical records available in the HRIS, the company, using simple statistical tools, should be able to calculate the needed number of new employees.

Figure 9.2 Model of the HRP Process With Use of an HRIS (as Modified From Dyer, 1982)



Source: Adapted from Dyer, (1982).

In addition to using historical records, HR professionals can use a number of forecasting techniques, both statistical and judgmental, that are available in the literature (see Noe, Hollenbeck, Gerhart, & Wright, 2010). These techniques will all produce a list of the estimated number of *employees by job* needed to accomplish the increased workload necessary to meet production changes based on a projected 2.5% market share increase. However, note from Figure 9.2 that these estimates comprise only one part of the estimated demand. The other part of this demand estimate comes from the annual average employee turnover, again, *by job.* Adding the forecasted need for employees based on the strategic objective, a 2.5% market share gain, to the average employee turnover rate by job provides an estimate of the total demand for human capital.

Estimating Labor Supply. As indicated in the box in Figure 9.2, estimation of the supply of available labor involves two components, external and internal. The external component is obtained from recent estimates of the potential availability of new employees by experience and skills in the company's geographic labor market. These estimates are available from state and national labor departments, local unemployment agencies, and employee

referral agencies. These availability figures can be categorized by company jobs in terms of potential new employees with the necessary KSA sets to fill jobs. The second source of data for the supply estimate is internal and concerns the historic movement of employees within the company by job, for example, the number of promotions and lateral transfers of employees between jobs. Again, there are both sophisticated mathematical and judgmental techniques to estimate the internal supply of employees. Note again that most of the data necessary for estimating internal supply will be available in an HRIS. These two estimates of supply are combined to provide an estimate of the total supply.

Phase 2: Planning HR Programs

Phase 2 in Figure 9.2 involves calculating the gap between the estimated *demand for employees* and the estimated *supply* of current and potential employees. Subtracting the supply from the demand figures can result in a negative or positive gap. Returning to our case of the brake assembly manufacturing company, we would expect the gap to be positive, thus indicating a need to add new employees and promote some current employees to open job positions. Of course, the gap could be negative (more supply than demand), indicating a decrease in the need for future employees. This situation could occur, for example, in a company downsizing its workforce due to weak annual sales.

The important point is that there will be a gap, and, as a result, planning for HR programs to close the gap must be done. In the case of the company estimating a 2.5% market share increase, a variety of programs tied to the HRM functions could be initiated. For example, recruiting for new employees could be expanded beyond the current method of using only newspaper ads to include the use of television and radio advertising. The company might also want to start recruiting on college campuses or to develop Internet recruiting, which will be discussed in Chapter 10. Internally, the company could begin training programs to facilitate the promotion of current employees. For example, it might offer a first-level supervisory training program for line workers that could have both formal classroom and on-the-job aspects (to be discussed in Chapter 11). Such programs would be expected to produce employees to fill the jobs that the HR department has

predicted will become available.

Phase 3: Evaluation and Control

As indicated in Figure 9.2, this final phase involves the implementation of the planned HRM programs from phase 2. There are some choices to be made at this point regarding HRM programs, for example, whether they will involve Internet recruiting and training. Will these programs be implemented by internal HR staff or by an outside vendor? Another aspect to consider is the expected cost-benefit ratio estimated for the new programs. Regardless of the programs that are implemented, one of the most important aspects of the HRP program is the evaluation of these new programs to determine if they have actually closed the gap between supply and demand. For the HRP program to be complete, the HR department must send the results of this evaluation to the HRIS, so they can be used in setting HRP objectives in future HRP programs. Particularly important is the evaluation of how useful the new HRM programs were in closing the demand-supply gap. This section covered the basics of HRP programs, which can be applied to planning the utilization of human capital, whether entry level or senior management. Having established the "nuts and bolts" of HRP, we will now examine the relationship between talent management and corporate strategy.

Workforce Management/Human Resource Planning With an HRIS

As expected, **Workforce Planning Systems (WPSs)** are available from a number of vendors. Their capabilities can be found in a variety of enterprise applications and standalone tools. The primary purpose of a WPS is to get the right people with the right skill sets in the right place at the right time to meet customer demand. A good example of a WPS is offered by Towers Watson (www.towerswatson.com/en/Insights/IC-Types/Survey-Research-Results/2012/11/workforce-planning-translating-the-business-plan-into-the-people-plan). You may want to examine this website since it will provide excellent information on WPSs and what they can do for a company. Other vendors who have WPSs are WorkForce Planning Associates, Inc. (www.workforceplanning.com) and WorkForce Software

(www.workforcesoftware.com/). Each of these websites provides information on WPSs/HRP as well as discussing its uses and benefits. Having established the "nuts and bolts" of HRP, we will now examine the relationship between workforce and talent management with the development of corporate strategy.

Long- and Short-Term Strategic Importance of Talent Management

There needs to be both a long-term talent management strategy (see *talent management*) and a **short-term tactical strategy** since the dynamics in the marketplace can change easily. In the long term, organizations need to invest now in employee talent to sustain a competitive advantage over time. When a new competitor enters the market with a substitute product or when the economy goes sour, investment in human capital may be suspended for a short period of time. Then, short-term tactics must be put in place to get past the economic downturn and keep employees motivated until the market improves. When conditions do improve, then the short-term talent management strategy—the *tactical strategy*—is halted, and the long-term investment in talented individuals—the *management strategy*—returns.

Population characteristics and labor market diversity will also have an effect on the deployment of a talent management strategy in both domestic and multinational enterprises. Regional differences in work ethic, age, gender, education, and culture will affect how talent management will be implemented and tied to the business model deployed for a particular geographic area within a country. More important, organizations need to consider sources of potential labor when building new plants in other countries as a result of going global. In Figure 9.3, we see the impact of globalizing a company on the "Inability to retain key employees" as a workforce problem because of differences in labor markets in different countries. It could also impact on the "Inability to attract qualified candidates" because there may be no potential new hires in specific countries who have the knowledge and skill for open positions.

Long-term talent management strategies also need to be linked to corporate

strategy. One very important strategy that must be maintained despite the state of the marketplace is **corporate brand management**. It has been confirmed repeatedly that the best labor talent is linked to highly regarded corporations that have excellent brand images (Burmann, Schaefer, & Maloney, 2008). Apple, for example, is considered the number one brand in the world—with a brand worth over $154 billion (Forbes, 2016). As a result of this brand image, the company receives over 1,000 resumes each day.

Maintaining the brand image, whether its excellence is derived from the company's products, services, or corporate leadership, is a key factor in attracting and keeping the best and the brightest employees in the workforce. Customer satisfaction, quality control, and promoting good corporate citizenship and a culture of learning and innovation help build a companywide brand image. A good talent management strategy needs to be tied to that brand image.

Talent Management and Corporate Strategy

There is little question today that our world is linked together in a global economy. One of the primary reasons for that link is the amount of information available almost instantaneously to everyone. Information about industries, stock markets, and governments can be analyzed quickly and acted upon, resulting in more investments being made in assets and resources by companies in multiple countries. The best example of how tightly our global economy is integrated comes from the 2008 financial meltdown of the housing market, which caused defaults in subprime and adjusted-rate mortgages, tighter credit policy, and falling house prices. These "junk" securities, which had been seen as a lucrative investment by financial institutions not only in the United States but also in China, the United Kingdom, and Europe, triggered a global economic meltdown.

The financial crises led to layoffs, corporate bailouts, and a sense that our global economy can be affected easily by shifts in economic conditions. Corporations had to make fundamental changes, not only to their business strategies, which became focused on the ways to compete in targeted markets and industries, but also to their talent management programs, which rapidly had to determine how to manage a reduction in their workforce. The long-

term strategy of growing talent in an organization has to be suspended when there is a significant economic downturn, and a tactical plan must be introduced. The tactical plan would enable a reduction in the workforce, while retaining the most talented and skilled employees in the company. The fundamental requirement to connect business and corporate strategy to HRP and talent management is based on the capability to adapt to changes in the global economy.

The literature on corporate and business strategy is vast and beyond the scope of this chapter, but multiple books on corporate strategy are available (Mascarenhas, 2011; Porter, 1998). However, an organization's strategic direction does have a significant impact on human resource planning and subsequently on its talent management strategy. Corporate strategy answers the question of what businesses to pursue to maximize the long-term profitability and growth of an organization or how to enter particular markets. Once the decision is made concerning which market or industries to enter, a business-level strategy defines how to compete effectively against other companies in that same market. In order to compete effectively, HR must play a key role by ensuring that employees have the right skills and tools to guarantee the success of that strategy.

But how can HR make a substantial contribution to executing a firm's business strategy when many executives at corporations still treat HR as a line of business focused on transactions and compliance? According to Becker, Huselid, and Ulrich (2001), for decades, HR professionals have struggled for credibility while achieving little or no impact on company strategy and only limited recognition of their contributions to corporate success. CEOs and top executives understand the importance of human resources—the number one asset within their companies. But how can human capital be linked to the success of the corporation? HR departments need to take on a value creation role to support corporate and business-level strategy. Becker et al. (2001) argue that the HR function has to become a **high-performance system,** "where every element of the HR system (selection, rewards, performance management, career development, etc.) is designed to maximize the quality of human capital in the organization" (p. 3). The research reported in their paper suggests that firms that have aligned HR systems with company strategy have seen an increase in dollar market value

per employee.

Despite the suggestion that HR should be a source of value creation for an organization, immediately investing heavily in new HRP systems is not recommended. The key is to understand what areas of an HRP program will make the most impact on a firm's strategy. Even more important is the idea that corporate and business strategies are not things to be kept inside an executive boardroom. Every aspect of a business operation, including marketing, sales, manufacturing, and HR, must be aligned and interlocked to support the overall goals and strategies of the business.

An example of aligning HR with corporate strategy was the decision by Walmart to enter the overseas market in China in the mid-1990s. Walmart's success occurred primarily because the company took a successful infrastructure, including an HRP best practices program and information systems used in the United States, and implemented it overseas. Trunick (2006) noted that Walmart brought its internal Walton Educational Institute to China when managers discovered that many of the Chinese employees were not fluent enough in English to come to the United States. Today, in comparison with its U.S. counterpart, Walmart China has a higher percentage of employees with university degrees and a much lower turnover rate, 16% as compared with 40% (Trunick, 2006).

Another key to Walmart's success in China was hiring qualified managers locally who knew the culture and buying habits of the local customers. Walking into a Walmart is a different experience in China than it is in the United States. Not only can you buy fresh produce in China, but items such as fish, turtles, clams, and eels are cleaned at the store and handed to the shopper in a plastic bag. The Chinese tend to shop at Walmart more often for fresh items because of their small-sized refrigerators and smaller living spaces, so the company fills a different need in China than it does in the U.S. market (Naughton, 2006).

This example illustrates how HR departments must make changes in their programs based on future corporate and business strategy. The marketplace for companies is changing constantly, and a sound business strategy that works today may not work tomorrow. Companies entering the consumer market compete for the same human resources available in the labor market.

The only axiom with merit about the future business of a company is that things change, and any business that is successful today may not be successful tomorrow. If the HR function is going to be aligned closely with changing corporate and business strategy, then it must be able to anticipate change and develop new HRP programs and talent management practices based on forecasted future corporate strategy. Using business intelligence systems that model competitors' business processes is a good start to anticipating the future direction of a company.

Anticipating Change and Creating an Adaptable Workforce

Change is given as a constant within any business, so companies need a workforce that can adapt to changes. In a study done by IBM Global Business Services (2008), three key capabilities were found to influence a workforce's ability to adapt to change.

> *First*, organizations must be capable of predicting their future skill requirements. *Second*, they need to effectively identify and locate experts, and *lastly* they must be able to collaborate across their organizations, connecting individuals and groups that are separated by organizations' boundaries, time zones and cultures. (p. 2)

Boundaries that exist today between the lines of business, geographies, and cultures of merged or acquired companies put a tremendous strain on an organization. If executive leadership is not involved to meld the workforce together under a unified vision, goal, or strategy, this strain will have negative consequences for the effective operation of the company.

The HR department needs to establish programs to assess the existing skills of employees, to develop new skills through training, and to create job conditions that help retain valued employees. Talent can be nurtured from within an organization by training. When the necessary skills are still not available from a workforce adaptable to change, then an organization must look to hire from the outside. It is interesting to note that, according to the

IBM (2008) study, almost 60% of the 400 executives interviewed believed they did a better job of attracting and retaining talent than their competitors. But, as seen in Figure 9.3, attracting employees or retaining them was still considered a high priority when the same executives were asked about the primary workforce-related issues facing their organizations. The inability to develop skills rapidly to address current and future business needs and the lack of leadership capability were, respectively, the number one and two workforce-related issues reported in this study.

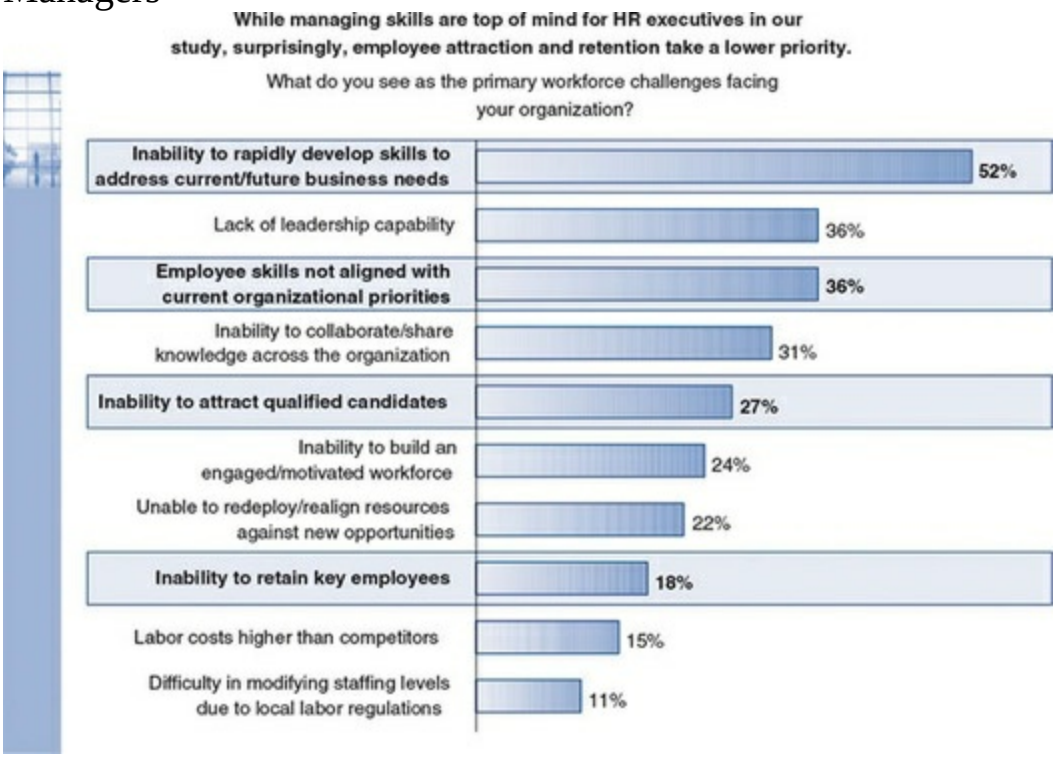
In planning for the future needs of a company, traditional HR managers need to recommend changes in their programs to attract, hire, train, and retain employees effectively. Developing an employee's talent is a driving force that enables a company to enhance employees' skills to adapt to future business needs. If HR executives are aligning HRM programs with corporate and business strategy, then unlocking and assessing employees' talent will give the employees the capability to adapt to change more easily. Some companies develop these capabilities by ensuring key individuals are rotated in job assignments every two years so that they learn multiple aspects of the company's business. Other companies use mentoring programs that partner long-term, experienced employees with newly hired employees. Still other companies have formal education programs for employees at various career development stages. Just as the marketplace for doing business is in constant change, so too are the HRM programs to develop talent within an organization and create an **adaptable workforce.** Mentoring, formal education, and job rotation have been available for years and have been used effectively by many companies. When the business climate changes, some long-term HR programs specific to talent management may get shelved or substituted for something else. It may be cheaper to acquire existing talented professionals from outside the company rather than to hire university graduates and spend time and money on extensive training programs. However, it may also be more difficult for newly hired and talented individuals to assimilate to the organization's culture, which might clash with the values and culture they experienced at their previous jobs.

Talent Management and Corporate Culture

Choosing the right KSA to require of job applicants is important for an

organization looking to hire talented individuals. But what are the organizational factors that a prospective applicant seeks when choosing an employer? Personal factors such as the applicant's age, family status, health, and financial condition can have a significant impact on what the applicant is seeking when he or she is considering joining an organization. For example, a young applicant who has a spouse with a good job at a *Fortune* 500 corporation may feel it would be more important to have a high income and forgo having the potential for promotion. There are a myriad of situations that could change what applicants are seeking in their next job; thus, there is not one set of organizational attributes that apply in all situations. But there seems to be one attribute of an organization that is considered important and valued by almost all applicants—the culture of the organization. As was discussed in Chapter 1 (Figure 1.2), the internal culture of an organization determines the manner in which HR programs and an HRIS are adopted.

Figure 9.3 Some Primary Workforce Challenges Facing Human Resource Managers



Source: Adapted from the IBM Global Human Capital Study 2008 (IBM Global Business Services, 2008, p. 20).

Corporate culture is an interesting phenomenon. It is based on the values that are seen as important to all members of a company. Corporate culture is developed as part of social networking and the creation of social norms when individuals work together as a group. Schein (1985), in an early definition of corporate culture, describes it as involving an understanding of what constitutes correct attitudes and perceptions, one that is shared by coworkers. Specifically, this culture is a pattern of basic assumptions—invented, discovered, or developed (by a firm's members) to cope with problems of external adaptation and internal integration—that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1985, p. 9).

Corporate culture has a strong effect on employees' beliefs and actions since it is based on a set of fundamental norms and values. Thus, there are many attributes of corporate culture, including ethics, dress codes, working at home or in the office, planned or unplanned vacation schedules, brand image, goals, and vision for the future. Corporate culture is not just defined but rather described to a potential applicant. The role of company executives and HR professionals is to foster culture and cultivate it to support the vision of how to conduct business within the organization. In addition, potential applicants need to know if the culture of the company matches their own attitudes and values about appropriate behavior in an organizational setting. High-potential employees need to understand the fit between their work patterns and the way an organization goes about doing business; they need to be able to envision themselves as being a part of the way in which the organization operates.

It is important for the organization to project a positive and accurate image to the applicant. As with its creation of a positive brand image, the corporation has to create a positive employment image, and recruiters should include a description of this image when introducing the company's culture to potential applicants. A study done by the Aberdeen Group (Saba, 2009) indicated that *organizational fit,* also known as *cultural fit,* surpassed other organizational attributes for first-time applicants. If the company culture does not match the values, interests, work habits, and personality of the applicant, then that applicant either will not take the job or will only stay for a short while.

Keep in mind that cultural fit between the company and applicant is an important consideration, but it is not the only one. There is no guarantee that, if the applicant fits well with the company's culture, high performance will be the end result. Current skills, past experience, previous job references, and educational history are all important ways to determine if there is a good employee–organization fit. Cultural fit is an additional factor that is of high importance for both the employer and the potential applicant. Determining whether or not there is employee–organization fit is a critical component of a talent management program.

Talent Management and Information Systems

The Link Between Talent Management and Human Resource Information Systems

Investing in human capital is one of the most significant expenditures for corporations. Measuring the return on investment (ROI) for human capital, as described in Chapter 14, has to be reflected in the HR balanced scorecard program to justify its acquisition and use (see Chapter 8). Talent management is just one of many components involving the investment in human capital. The importance of using an HRIS is to ensure that the HR programs of attracting, hiring, educating, and nurturing employees are executed well and consistently over time because this is the heart of the talent management program. The numeric results of the components of the HRM program that comprise the criteria for the TM program are (1) the number of talented individuals hired, (2) the training of these talented individuals, (3) the job performance of the individuals, and (4) the retention of these individuals. The HRIS can capture these results based on performance criteria, so it is possible to measure how well HR programs, as part of the overall talent management program, are meeting the expectations of HR executives and senior management. As discussed in Chapter 7, these numeric results can also be used to calculate cost-benefit ratios to determine the contribution of these HR programs to the profitability of the organization. Details on the criteria measures needed as well as on the calculation of the cost-benefit ratios can also be found in Cascio (2000).

Not only can an HRIS assist in the implementation of best-of-breed programs and processes, but it can also be used to help ensure adoption of these processes by the user community. Building consistency and setting standards are the key drivers for an HRIS—every process implemented should be done in a similar manner. An HRIS can also assist in developing those processes (see Chapter 5) and help to establish the best talent management programs. For example, an HRIS can also be used to help develop and administer education programs for all employees, regardless of job level.

Since talent management is only one component of **human capital management (HCM)**, there are many questions that need to be answered when one initiates a general HRP program that includes TM and considers how to best use the HRIS to support this program. Is there an existing HRIS in use today that has software that can support talent management? If not, should you build the new system in-house, buy an out-of-the-box application, or outsource all of the processes to a vendor who specializes in TM? How will critical, secure data be protected for prospective applicants across multiple systems and, for multinational enterprises (MNEs), across multiple geographic regions?

Information systems can be found in every aspect of talent management, from conducting job analysis to focusing on the human capital demand and supply for current and future jobs, attracting the right talent in a specific location, hiring based on desired attributes, and retaining high-performing employees. Ultimately, the HR department of an organization would use an HRIS to monitor and measure the overall contributions of talented employees with other results on a balanced scorecard, and these results could affect the design of other HRM programs. As with the other parts of an organization's HRIS, today's talent management software applications are increasingly deployed using a software as a service (SaaS) approach. As can been seen in Figure 9.4, SaaS/hosted applications have grown in most of the HRM programs that support a talent management strategy. Beaman (2012) further notes:

> SaaS deployments for Talent Management functions show steady growth, particularly in the areas of Compensation (44%), Succession (219%), and Career Development (185%), which also can be attributed

> to the “unified talent management” approach of vendors such as SuccessFactors and Workday. (p. 24)

Also as noted in Chapter 8, Kaplan and Norton (1992, 1996, 2006) recognized that an organization cannot use only financial measures such as ROI on a balanced scorecard as an indication of its ability to survive and maintain a competitive advantage. Kaplan and Norton (2006) further identified the four components of the balanced scorecard as financial, customer, internal business processes, and learning and growth. As discussed in Chapter 8 and depicted in Figure 8.12, these components reflect a commitment to balance the organization’s strategic goals, which are important to the expectations of its multiple stakeholders. An overview of all four components can be seen in Figure 8.12 along with the key question associated with each of the four. Particularly relevant to the results from a talent management program is the “Learning and Growth” box in Figure 8.12. Note the requirement in this box for *objectives* to be set, *measures* to be developed, *targets* to be achieved, and *initiatives* to be implemented. These categories represent the results that would be entered into the balanced scorecard for an organization.

However, no matter how an HRIS is used to support talent management or other functional business areas, accurate and timely data are the key to successful program operations. An organization needs not only to collect data about potential job applicants but also to know the skills of the current employee resource pool. Before planning new HR programs to resolve the gap between forecasted demand and supply of human capital, a company needs to know what skills exist in the current workforce and what skills are needed based on the future strategy, and it needs a systematic approach to acquiring this information. An HRIS can be of great assistance in providing information on current employee skills, succession relationships, and leadership readiness (see Figure 9.5).

If the organization does not have the capability to develop the necessary HR business programs and processes, this is probably the time to use outside HRIS consulting companies as detailed in Chapters 5 and 8. HRIS consulting and management consulting companies are able to define future business strategies, and they can also help the organization implement those strategies.

IT consulting companies, in particular, specialize in improvements to business processes in areas such as enterprise resource planning, supply chain management, and product life cycle management. HRIS consulting firms can also make recommendations to use business process management systems, and they can support the implementation and integration of those systems.

The key starting point for any consulting group is performing a business strategy assessment for an organization, and the organization should not proceed with a vendor until this project is finished. No information system, whether it is an application package recommended by a consulting firm or homegrown software, will fix, enhance, or salvage a poorly defined business strategy plan. For example, in the mid-1990s, Kodak was trying to transition from film-based to digital photography and then to focus its business on digital sharing. Kodak's business strategy shifted from the need to have employees skilled in the manufacturing of film to a need for employees skilled in the manufacturing of digital cameras (Nossbaum, 2006). The age of digital equipment advanced so quickly that Kodak almost missed the revenue growth area of writing the software to support the sharing of digital photos across the Internet. But the company did finally shift its business strategy to offer digital sharing services.

The talent management functional areas offered by application software products include many of the topics that we have already covered in this chapter, such as skills assessment, succession planning, recruiting management, career development, and employee life cycle. There are also a number of consulting firms that can help tailor an application package for a company and help to implement it. The International Association for Human Resource Information Management (IHRIM) has a list of consulting companies and routinely evaluates HRIS software applications. Additionally, IHRIM is a good source for finding HRIS vendors.

Many of the applications covering the above topics are usually categorized as cross-industry packages. This label means that the application functionality and the processes are similar and can be applicable for all industries. Many of the functions and processes within HR tend to be the same and can be handled by the same application. Thus, the application companies can keep software development and ongoing maintenance costs low by supporting the

concept of one version fits all. Today, HR processes supporting talent management are becoming more intricate, and application software vendors are now offering solutions by specific industry. An HR recruiter seeking to hire former doctors and nurses for a biotech or large pharmaceutical firm will get a different industry view of the recruiting software package than someone hiring drivers or dispatchers for a trucking company.

Application packages are also divided into offerings for small, medium, or large firms. There is a tendency today to offer scaled-down applications for small companies, which may not need all the features of a large-enterprise version. In addition, as discussed above, software companies will also offer a hosted, subscription-based version of the application to various customers as part of a SaaS solution. By using the hosted software, clients save on investing in licensing and maintenance fees; instead, they pay a low monthly rate to use the software. A hosted offering allows a customer to try the software using Web access without making a large investment in hardware and other computer infrastructure.

Talent Management Software Packages

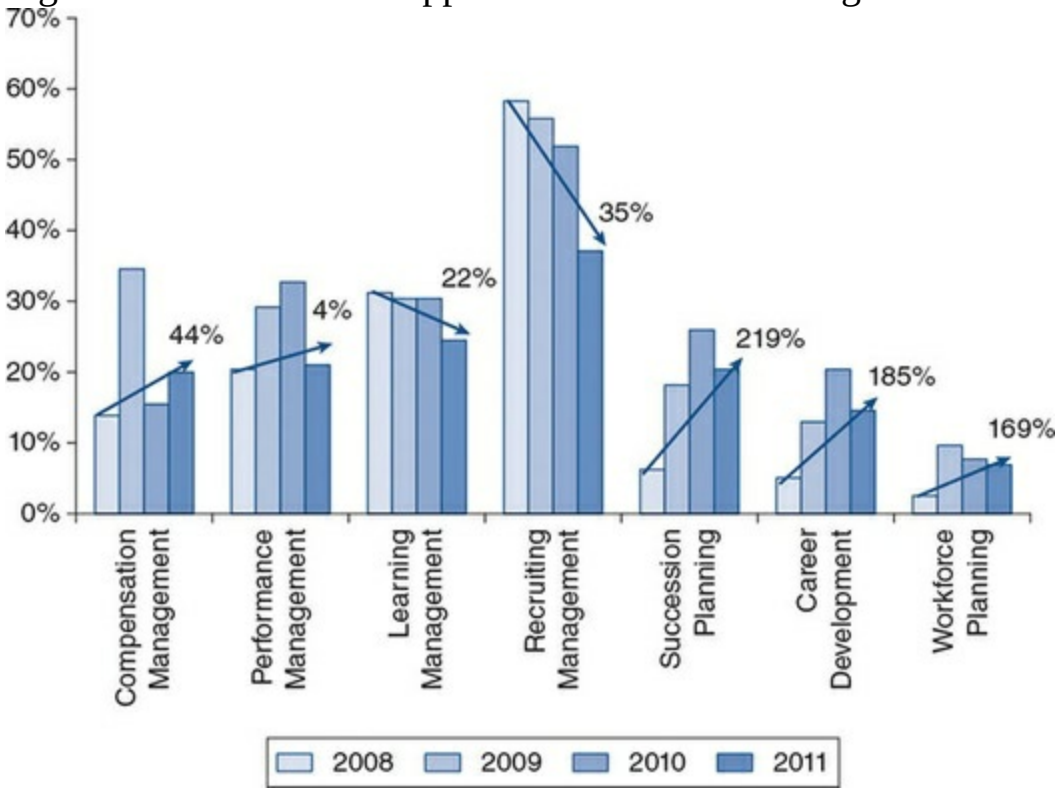
There are a significant number of talent management software applications available for organizations today. Some of the top vendors include SAP, Oracle, and Cornerstone OnDemand. The talent management market is growing by double digits and is now over $5 billion (Bersin, 2014).

For example, SAP's SuccessFactors was a small start-up company founded in 2001 by Lars Dalgaard. The company's core competency resided in Web-based performance management software and the joint creation of employee goals and appraisal reviews that were managed by both employees and management. Given the global nature of business in the early 2000s and the growth of virtual offices, SuccessFactors offered a solution to conduct appraisals remotely and provided a means to provide feedback at multiple points throughout the year.

Like SuccessFactors, companies such as Saba, Taleo, and Conerstone OnDemand each started in a specific area of talent management and, over time, began offering a suite of modules and functionality that covered a range

of talent management capabilities to plan, attract, develop, reward, engage, and retain employees. For example, Taleo's core competency was the recruitment of new employees when it started in 1996, and Cornerstone OnDemand and Saba got their start in learning and development. In addition to these major players, there exist a number of smaller companies that specialize in a specific functional area and provide alternatives for companies looking to integrate best-of-breed applications, or smaller companies that only need specific functionality rather than a full suite of talent management modules.

Figure 9.4 SaaS/Hosted Applications—Talent Management



Source: Beaman (2012, p. 23). Reprinted with permission.

Figure 9.5 Employee Skill Assessment and Succession Planning With an HRIS

Source: © SuccessFactors, Inc. All Rights Reserved.

Talent management is a hot area for the major companies such as Oracle, IBM, and SAP. Just like in 2007 when a flurry of acquisitions were made in analytics, in 2011–2012, these vendors began integrating smaller talent management vendors into their companies. For example, SAP purchased SuccessFactors in late 2011 for $3.4 billion. Not to be outdone, Oracle bought Taleo in February 2012 for $1.9 billion and IBM bought Kenexa in August of that year for $1.3 billion. Why such a flurry of acquisitions? Because people are the single most expensive resource for a company and managing people is a complicated endeavor. Thus, anything that can assist managing employees more efficiently at a reduced cost is a welcome benefit to corporations.

When talent management systems were first implemented they often were used to downsize the HR department and to outsource support overseas. Because of culture, language, and time differences, those early systems often did not meet employee expectations, and employee satisfaction was low. The overall employee experience was like getting a slap in the face. Frustrations mounted and the goal to recruit the right resources for future jobs was not being achieved.

The good news is that unlike systems from just 10 years ago, today's systems are more user-friendly and focused on the employee experience. Just as Customer Relationship Management systems have moved to Customer Experience Management (CXM), so too the design of talent management systems are incorporating CXM capabilities. They are providing more useful information, improving employee use. In addition, the need for outsourced personnel to field phone calls is being reduced.

Trends in Talent Management Software

So what is the future of TM software? From the vendor's point of view, it's pretty clear that cloud enablement is the number one direction. Most of the TM software today is being developed to run in the cloud. The popularity of on-premise software is waning, with the exception of niche software companies. All of the major software vendors now supply their own cloud-enabled environment, and because of the lower-priced cloud solutions compared to on-premise many companies are trying to differentiate their cloud offerings by other means, such as mobility, social tools, and analytics. Companies who will succeed are those who can provide a good user experience, and who can develop applications that allow candidates and employees to access the software from any device and any location.

According to Karl Ederle, VP of Product Strategy for Oracle's Taleo software, when designing software, developers will sit with the user in their home and watch them use the software to gain insight on the overall experience. According to Karl, it is key to understanding the ways in which a prospective candidate interacts during the acquisition process. For example, mobile devices such as tablets and phones provide the capability to sign legal documents without having to print, sign and scan, or do remote video interviews. Advertising remotely through the use of social media provides collaboration between the company and the talent pool. Embedded analytics and the use of Big Data can provide insight into how well a candidate will fit within the culture of the organization. With the help of analytics, companies can better determine what attributes will make the right fit for a candidate, where the pool of talent resides, and how to attract and keep the talent over time. Ultimately, vendors will continue to look for new ways to differentiate their TM solutions because competition for talent management software is

keen, and will remain so as long as people are the number one organizational asset.

Recruiting Top Talent Using Social Networking Sites (SNSs)

Social networking using the Web has become popular with recruiters and potential applicants. Print ads in newspapers are still being used, but at a considerably lower rate than 10 years ago. **Social networking sites**, such as Facebook, LinkedIn, and Twitter, are just media to increase the flow of information for making social connections. It is accurate to remember that many employees hired by a given company were referred to the HR department by a friend already working in the company. Contacting the people you know is sometimes the quickest way to get an interview. There are no guarantees that you will be hired, but personal referrals generally give you an advantage over those applicants just submitting a resume to a company. On the flip side, HR professionals network in support of talent recruitment. So social networking to support both HR and career development is not new—only the tools have changed.

Using SNSs to recruit top talent can be effective, but there are some limitations. Social network demography indicates that social networks are primarily used by a younger audience. Therefore, recruiters have to be aware of the difficulty of matching potential applicants to the required skills. If recent college graduates comprise the target audience for your recruiting effort, then social networks can usually provide a direct link to potential applicants. But if a company is looking to hire individuals to work in IT jobs, then the age of the audience and the way you reach it may change due to the necessity of hiring experienced IT professionals.

Recruiters searching for top talent also must be aware of their own company’s website and ask themselves if it has enough information for applicants to be interested in envisioning working for the company. A company website needs to target not only potential customers but also high-potential applicants. Here are some questions to keep in mind when you are looking to recruit top talent:

- Does the website make it difficult to find the link to career paths?
- Does the link use the word “careers” or the phrase “job opportunities”?
- Are there employee testimonial videos or videos from senior-level executives discussing the company’s culture and mission?
- Is it easy to use the search engine to find specific jobs?
- Are there too many steps for an applicant trying to submit a resume and apply for a job?
- What is the process to contact the applicant after he or she has applied for a job?
- Is there any follow-up contact over a period of time?

See Chapter 10 for more information related to these questions and for a broader discussion of e-recruiting and Chapter 16 for more information on the use of social media in HR.

Using Information Systems to Set Goals and Evaluate Performance

Tying measurable goals to company strategy is important. Studies have found that overall employee productivity increases along with company morale when employee goals are aligned with company strategy. Before employee goals can be set, the company strategy needs to be well defined, outlined, and communicated throughout the company. Large MNEs are typically in global businesses and have to ensure that the strategy is passed down from the CEO to first-line managers and all employees—and then to all subsidiaries of the parent company. If goal setting at any level in the organization is done poorly, it can hurt overall employee morale and cause confusion in the company’s operations. To develop and retain highly motivated employees, the company must link employees’ job responsibilities to the overall company strategy, and this link must be visible to other employees.

Subjectivity, however, will never be removed from any manager–employee relationship or from any performance review, but HRIS package tools provide a basis from which to monitor performance results that are recorded throughout the course of the performance measurement cycle. Many performance tools utilize the SMART acronym for goal setting. SMART has

gone through various interpretations over the years since it was first introduced by Doran (1981). In the article, Doran established the acronym SMART to describe how to write performance goals. The acronym SMART stands for (1) *s*pecific, (2) *m*easurable, (3) *a*ttainable or *a*cceptable, (4) *r*easonable or *r*esults oriented, and (5) *t*imely.

Using Analytics for Talent Management

Much has been said about **workforce analytics** (Chapter 14) and business intelligence (Chapter 2) in this book. Analytics is a part of the business intelligence (BI) tool set, and workforce analytics is specific to BI as it relates to HRM. Although the focus of this section is using analytics for talent management, it may be good to first dispel some of the assumptions about using analytics in general. Analytics is an interesting area within information systems and the HRIS literature. It is one of the most frequently discussed topics between IT professionals and line managers. Analytics has a tendency to be seen as a panacea for many problems associated with the inability of getting the correct information to the end users, managers, and HR professionals—the information they need so they can make better decisions. Whether it is in the HR, IT, or another department, most people know enough about analytics to use it to solve problems or make forecasts, for example, predicting future workforce needs or trying to discover why their organization has a high employee turnover rate. Unfortunately, analytics does not solve the problem of inaccurate data entry since garbage in, garbage out (GIGO) will prevail. It also cannot predict the future with 100% accuracy. Instead, analytics can build a model of what the future may hold, but businesses cannot rely solely on strategic decision making based solely on the results of predictive analysis. Other factors must be taken into consideration, such as the competition, government compliance, or the current state of the economy. That is, analytics, by itself, cannot solve everything, but it constitute a very powerful tool to analyze data and to provide the fuel for intelligent decision making—good information. In short, analytics can be used to gain a competitive advantage in the marketplace.

Today, there are software packages from HRIS and IT solution vendors that can build front-end dashboards and queries that anyone can use. These packages have taken the complicated world of business intelligence and its

components, which were quite difficult to use in the past, and made it easier for business professionals to leverage BI tools more quickly. Deploying an analytic software package, however, does not tell you what specific kind of data you should be analyzing or what questions need to be asked. The skill of knowing the right questions still has to come from the business professional. When questions become complicated and linked to other areas of the business or the amount of data that needs to be analyzed is huge, then a skilled BI person is a necessary resource; you need someone able to get the most out of the software package. But using cognitive computing and predictive analytics may change the face of traditional BI, and once deployed, the need for human interface may dwindle over time.

Workforce Analytics and Talent Management

Using workforce analytics to manage talent can involve asking many questions about an individual person or a group of employees. Typically, a simple question about an individual employee's history is answered by using a query program against the **employee data warehouse**. This is not a really complicated environment as long as your organization has the query tools that can get the answer from a data warehouse. The real purpose of analytics for talent management is to use the analytics to model characteristics of success, in terms of the skills and abilities of employees who were successful in the company versus employees who were not successful. This empirical analytics model could then be used for a pool of existing employees or new potential hires to determine their possibility of success in the organization.

For new hires, an employer may like to know the demographics of existing, successful employees to see if the company image and recruiting programs are attracting the right individuals to the company. This is an important use of analytics because recruiting programs vary from Internet-based recruitment using social networking to programs focused on local media advertising through newspapers or television or participation in recruiting fairs. All of these recruiting programs cost money, and it is important to know where to spend the money to attract the best talent. By successfully using analytics, a company can also better train its managers on hiring tactics, and resources can be better funneled to the right recruitment channel.

For existing employees, analytics can be used to understand the personal characteristics of successful employees. Data such as previous work experiences and education and training both within and outside the company can be collected and analyzed to determine what helps prepare these employees for success. Also, data about performance objectives can be compared with actual business results. This information can be collected and stored in an employee's electronic career jacket, which also contains a record of current job responsibilities, previous promotions, and the length of time between promotions. Analyzing all of this data is the reason that models need to be designed and the right data must to be loaded into the data warehouse. It is better to understand the type of information that you need for decisions prior to building a data warehouse. Without this, data warehouses have a tendency to multiply across organizations until there are too many to manage. Generating reports and answering simple queries is the primary baseline for analytics within business intelligence systems. Being able to turn data into intelligent information and draw conclusions about the employee population is where sophisticated analytics comes to the forefront of business intelligence systems. The newer generation BI systems with HR-specific algorithms, in combination with cognitive computing, can now give senior executives what they have desired for many years—an accurate description of the employee population and the means to make intelligent decisions regarding the company's human capital.

Mapping employee success to business results is not an easy task. The dilemma is that, although employees are the largest capital cost of any organization, not enough information is known about this most expensive asset. This problem leads one back to the HR balanced scorecard and the importance of using analytics to draw the right conclusions about the demographics of successful employees. This information on the HR balanced scorecard offers so much more than a simple monitoring of performance results. It helps to answer an important question: What characteristics make a talented employee successful?

Measuring the Success of Talent Management

As baby boomers retire and leave the workforce, both the competition to attract and the costs of acquiring new, highly talented individuals are only

going to increase. Many boomers may delay retirement due to the 2008 economic crisis and the lack of stability associated with pensions, but, at some point, there will be a labor shortage that needs to be addressed by HR executives (Kavanagh, 2008). The HR organization will also be under heavy pressure to provide a succession plan for key executive roles, as well as a succession plan for the company's board of directors. All of the costs associated with acquiring the best applicants will have to be justified and approved by financial management using an ROI calculation no matter if the job is for a senior executive or a new sales representative. So given that the costs of developing succession plans and acquiring talented workers will increase in the future, it is important to measure the success of these programs over a period of time. Performance management and its use within the balanced scorecard will be critical in justifying the extra expenditures needed to acquire the most talented individuals in the market.

Performance management is not simply evaluating an employee at the end of a given business cycle; it is not just a year-to-year appraisal. There are critical success factors that are evaluated by management: for example, leadership, skill development, creativity, and knowledge about the industry and sales results. The key to performance management is to ensure there are measurable performance criteria that an employee can realistically achieve over a period of time.

Measuring performance results is critical in today's workplace. This results-oriented perspective is not just limited to the sales department, where results can be measured against quota objectives. It now exists in all departments from marketing, which measures campaign results by tracking new customers, to procurement, which accepts a new purchase order application that saves double the cost. This results-oriented perspective is also expected in the HR department (see Chapter 14). That is, the HR organization needs to compare the costs of current or proposed programs to the financial benefits produced. Then, the overall result can be expressed as a cost-benefit ratio, and this information can be reflected on the balanced scorecard.

Summary

The primary purpose of this chapter on the introduction to talent management (TM) was to investigate how an HRIS and other information systems can be

used to support a talent management program. The importance of talent management was illustrated by examining the results of two comprehensive surveys. The origin of talent management and its fit with human resource planning (HRP) and human capital management (HCM) were discussed in detail. In addition, strategic HRM was covered, and its relation to corporate strategy was discussed.

The relationship between TM and performance management was explained as being critical to the effectiveness of the entire TM program. In addition, the chapter emphasized that the metrics from both the performance management and the TM programs could be entered on the balanced scorecard, which, in turn, contributes to the strategic HRM function. To understand a TM program, it is necessary to realize that the program reacts to labor and consumer market changes, producing a life cycle for TM. In developing and implementing a TM program, HR specialists must identify talented individuals by assessing the important personal attributes of employees and new hires.

A talent management program is part of the HRP function of an organization. One of the important ingredients for an effective HR plan is to have *accurate and timely* job descriptions based on job analysis. An HRP program consists of three phases: (1) estimation of the demand and supply of human capital to set HRP objectives, (2) planning HR programs, and (3) evaluation of HR programs and control through feedback on program outcomes. The HRP program will generate HR metrics that are useful for the organization in going through these three phases.

Long- and short-term strategies for TM were covered. When an external event occurs unexpectedly, such as the recent recession, a short-term strategy should be available. Conversely, the company should have a long-term strategy for TM, usually one looking 5 to 10 years into the future; this long-term talent management strategy is part of the overall corporate strategy. In this way, the TM program can make a major contribution to the immediate and future strategic positions of the corporation. A major aspect of a successful TM strategy, short or long, is to have an adaptable workforce. For example, cross-training employees on jobs is a way to increase the adaptability of the workforce. Finally, the value of a positive corporate

culture in attracting talented individuals was discussed.

The link between TM and HRIS was also covered in this chapter. There are quite a few quality TM computer applications available to companies, and most have been used successfully. Recruiting talented individuals by using social networks has been increasing too, but companies should be aware of the limitations of this approach. Some questions were posed that people should keep in mind when using social networks for recruiting talent. The use of analytics in TM was described, particularly the use of business intelligence to produce TM analytics. The success of TM was covered and emphasized the use of metrics generated by the performance management program and entered on the HR balanced scorecard.

Key Terms

Discussion Questions

1. Why is it important to establish the meaning of talent and talent management in a particular organizational setting?
2. How does the strategic direction of the organization influence human

resource planning activities?

3. Given the different needs of the HRP/workforce planning process discussed in this chapter, what types of data would you expect the HRIS data warehouse to contain?
4. What are the uses and benefits of workforce management systems/HRP systems? Check one of the websites mentioned in this chapter to obtain this information.
5. What are some potential disadvantages of using a packaged application to help automate the employee goal-setting process?
6. How would you use workforce analytics to support talent programs such as recruiting, retention, and employee development?
7. Why is it important to have an adaptable workforce in a global economy?
8. Discuss the underlying attributes necessary to support high achievers.
9. How might the attributes of a highly motivated employee change for different job descriptions?
10. Discuss corporate tactics that can be used in a down economy to keep top talent.
11. Discuss how you would use information systems to support succession planning.
12. Discuss the pros and cons of using social networks to recruit top talent.

Case Study: Vignette Case Continued

18 months later . . .

Once again Rudiger is sitting at his desk in his seventh-floor office in central London reflecting on life. The move from Barcelona to England went smoothly, with the last crate arriving only two months later than the rest. He is still working hard, but the hours are slightly better since the introduction of the work-life balance policy last year, and his family has settled well into the idyllic English countryside.

As the global head of People and Talent, he still has problems, though—just different ones. The talent strategy “Our People–Our Talent–Our Future,” which he presented to the board in his third month, identified the need for robust HRP information and analyses that required a new version of HRP

software. It is in its early stages, but the intensive data-cleansing and updating activity has been straightforward so far. More concerning are the metrics responsible for producing the information needed to develop far-reaching HRP policies and practices for the future. The metrics are relatively easy to construct, but it is proving tricky to find the right “bundles” of predictive metrics—this is holding up progress with the analysis application package. In addition, there have been cost overruns in the implementation of the HRP software, and some senior managers are wondering if the new software should be abandoned.

At least three of the 12 board members will retire in the next two years, and they are looking to groom their successors. At least one will have to be hired from outside the organization, and the HR department is not sure what the CEO wants for this position. In addition, employee turnover and an aggressive growth strategy mean hiring new employees as well as training transferring current employees. The work that is involved in defining competences (KSA sets) at skill levels within jobs is progressing well, with hard-won support from the unions. However, job descriptions that can be found are at least three to five years old, and some jobs have no descriptions. The new apprenticeship scheme is about to be launched, and the international graduate student package and development program has been completely revised. Overall things are progressing OK, but there is much to be done.

Case Study Questions

1. How would you recommend that Rudiger begin to develop an HRP program? What are the steps that he needs to take?
2. How should the problem with the job descriptions be handled? Should the unions be involved?
3. What are some of the problems in the past that have led this current situation to occur?
4. Why do you think there are cost overruns? How could this have been avoided?
5. Why are there problems with implementation of the new software?
6. How will job descriptions be developed for the positions of board member and international student intern?

Industry Brief: Michelle Tenzyk, East Tenth Group

Talent management will continue to be one of the biggest challenge facing leaders as we move through this decade and into the next. There are three crucial areas of talent management that must be considered: acquiring talent, keeping talent, and developing leaders from your talent.

Acquiring talent is about more than just learning how to communicate with and attract millennials and the subsequent generations; it's adjusting to a rapidly changing, globally connected world that requires more than just the skills to do the job; you need talent that can be flexible and adaptable enough to change direction quickly, without losing their pace. As with everything else in business these days, recruitment is moving faster and must be more flexible, fluid, and responsive to the rapid changes occurring inside and outside of your organization.

According to PwC's Global CEO Survey, CEOs are worried about attracting skilled talent. More than half of global CEOs surveyed anticipate the need for adding headcount, but concerns about acquiring the talent they need is the highest it has been in a decade. To overcome talent acquisition concerns, remain competitive, and meet growth needs, most organizations will need to reevaluate their talent acquisition strategy by investing in talent acquisition, proactively seeking talent.

Keeping talent is another challenge altogether, because even when your team members aren't looking for a new job, if they are good at what they do, everyone else is looking for them. Part of the talent manager's role will be doing everything necessary to keep team members happy so that you don't lose the investment you make in acquiring and developing them. Keeping the right talent will require a flexible, open approach that is as much about clearly communicating your culture and brand. People analytics—using data to make better, smarter, and faster decisions about your human capital—will be a necessity of the future, not just for HR but for every area of your organization. Stay interviews, global mobility opportunities, rapid feedback, and leadership development opportunities will be essential for keeping strong talent.

Developing leaders should be an ongoing part of your overall talent

management strategy. Changing dynamics in the workplace require business leaders to have multiple team members who are prepared for leadership positions earlier in their careers by always having multiple candidates capable of filling any key position, by hiring enough tech-savvy talent to propel the organization forward, and by always seeking nimble flexibility in team members.

Stagnating organizations will not survive, and talent management must transform by using data analytics and metrics to make better decisions, by implementing more sophisticated and modernized recruiting methods, by creating cross-functional teams, by increasing the overall adaptability of the workforce, and by creating a culture that attracts the right people. Technology will be at the center of these decisions, providing data and analysis tools to managers.

Student Study Site

Visit the Student Study Site at **study.sagepub.com/kavanagh4e** for additional learning tools such as access to SAGE journal articles and related Web resources.

10 Recruitment and Selection in an Internet Context

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Editors' Note

This chapter is the second one that is concerned with the talent management of employees. As noted in previous chapters, talent management is an extremely important strategic goal for organizations, both domestic and global, and relates directly to the HR balanced scorecard discussed in Chapter 8. After the need for external hiring of new employees has been identified via HR planning (Chapter 9), the next step is to design recruitment and selection programs that will result in the successful hiring of needed talent. Successful recruiting and hiring of new talent is an early step following the identification of job requirements, in the talent management process, which concludes with the retention of high-performance and committed employees. This chapter will cover the concepts of recruitment and selection and the use of the Internet and an HRIS to improve the operation of these HR programs. Specifically, it informs the reader on how to maximize the effectiveness of e-recruitment design and implementation. Further, with the majority organizations utilizing technology in support of selection, the chapter informs the reader on important considerations such as equivalence and bandwidth when moving online. Finally, the chapter points out that, as with any technology implementation, there are risks associated with the use of technology in both recruitment and selection and discusses how companies can address these risks.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the relationship between the Internet and organizational recruiting objectives
- Discuss the potential advantages and disadvantages of online recruitment in the framework of recruiting objectives
- Discuss recruitment strategies and social networking
- Understand the relationship between e-recruitment and HRIS
- Understand the relationship between selection and assessment with HRIS
- Discuss the technological issues that influence selection and the solutions that have been reached
- Understand the value of HRIS selection applications through the use of utility analysis

HRIS In Action

Bank of America looked for a computer-based solution for its problem of merging selection tests with the firm's applicant-tracking software application and found that this could be done. The company wanted to improve the quality of the applicant pool it obtained through Internet recruiting by adding selection tests to the process. It was thought that adding valid selection tests would improve the quality of candidates such that those assessed by tests would be much more likely to be successful on the job than those who simply applied through the Internet. Also, the company, by increasing applicant quality through testing, could reduce applicant-processing time.

Bank of America contracted with a test vendor to improve its selection system first. The vendor created competency profiles for jobs by interviewing about 50 current job incumbents and managers to ascertain that the competency profile for each job had the correct skills listed for the job. A "set of inventories was then identified to map onto the confirmed competencies and serve to identify the candidates who had the greatest potential for success

in the job and would be the right candidates scheduled for final interviews" (Society for Human Resource Management [SHRM], 2004, p. 1). The next aspect of the project was to change the interface on the Web page for Bank of America so that recruiters could get the applicant information they needed to manage applicant information for 100 hiring sites.

Next, the promising applicants were asked to visit a Bank of America staffing facility, where they completed three tests and inventories on a computer terminal. Once there, candidates watched a job preview video and then were directed to a computer terminal to key in basic contact information and complete three more tests. Candidates who were not comfortable with computers were able to access a built-in tutorial. After candidates had completed this procedure on the computer, the site administrator had just-in-time access to the test results. This enabled the administrator to conduct on-the-spot interviews with the candidates or schedule just-in-time interviews for a later time. Thus, Bank of America was able to introduce technology in one area of the selection process rather than trying to automate the entire process. In addition, this procedure allowed human contact with the candidates and maintained system security, particularly for the selection tests.

By combining online testing with its applicant-tracking system, Bank of America netted some significant results:

> *Improved ability to identify successful performers.* Of those who passed the test phase and were hired, 84% were rated as successful performers by their supervisors. In fact, passing candidates were five times more likely to be successful on the job.
> *Significant return on investment.* The estimated annual return on investment from using the system in selecting for the Operations job family was more than 2,000%.
> *Favorable reactions from candidates.* Ninety-seven percent of respondents expressed overall satisfaction with the selection process and agreed that the answers they were asked to provide represented their abilities.
> *Valid and fair assessment of candidates.* The inventories included in the system were able to distinguish between high and low performers and increase the probability of selecting the best candidates. In addition,

> analyses broken out by race, gender, and age showed that the inventories treated all groups fairly. (SHRM, 2004, p. 2)

Introduction

> *If you think it's expensive to hire a professional to do the job, wait until you hire an amateur.*
>
> —Red Adair

To remain competitive in today's global environment, organizations are searching for more efficient and effective means of acquiring and maintaining a highly qualified workforce. One popular and highly productive strategy for meeting this goal has been the use of technology, especially the Internet. Thus, the focus of this chapter is to consider the impact of technology on the recruitment and selection processes in organizations. In the paragraphs that follow, we will discuss the effects of technology on these two key processes. In the recruitment section, we address the objectives of the recruitment process and whether or not online recruitment is helping to achieve these objectives. The recruitment objectives, which are based on the model of Breaugh and Starke (2000), include cost of filling a job opening, speed of filling a job opening, psychological contract fulfillment, employee satisfaction, retention rates, quality of applicants, quantity of applicants, and diversity of applicants. We also discuss the impact of the attributes of the organizational website on applications and the use of social networking. In addition, the relationship between e-recruitment and human resource information systems (HRIS) is explained. In the selection section, we address the importance of assessment and its role in HRIS. Technology issues surrounding selection, such as validity, computerized assessment, security, and proctoring, are also discussed. We then present the ways in which the HRIS has been integrated with the function of selection and assessment to address the issues mentioned previously. Finally, we demonstrate the value of selection with HRIS selection applications through the use of utility analysis.

Recruitment and Technology

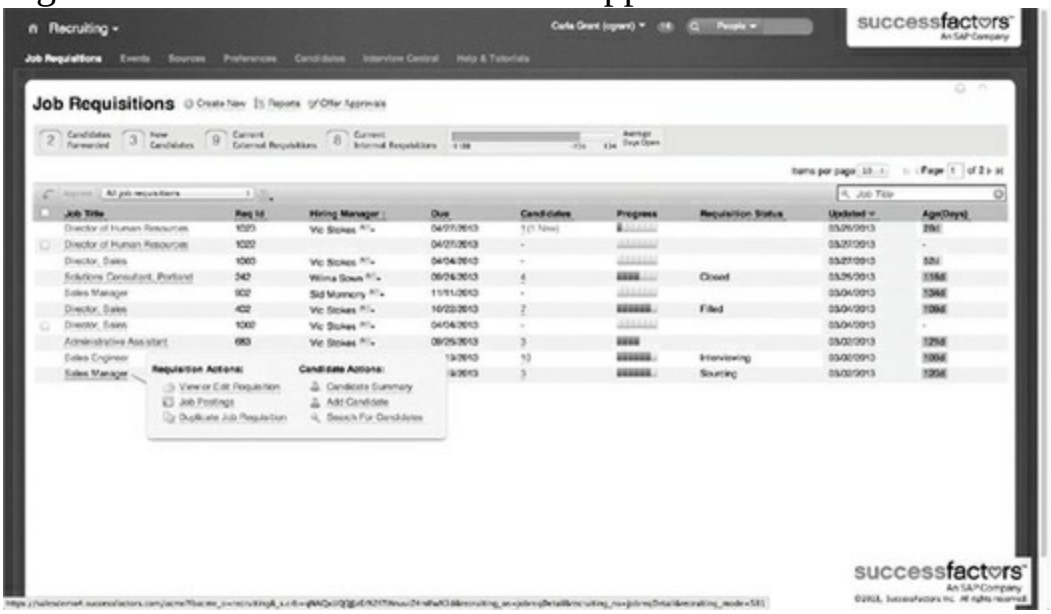
The goal of the **recruitment** function is to identify, attract, and hire the most qualified people (Cascio, 2013). However, this task has become quite challenging because there is a growing competition for talent in the labor market (Towers Watson, 2012). Companies are increasingly being required to expand their search for applicants beyond local and domestic borders to find qualified talent. As a result, they have begun using the Internet as a means of attracting job applicants. In the United States, over 90% of large companies use the Internet to recruit applicants for job openings (Cappelli, 2001; Lee, 2005; Taleo Research, as cited in MacMillan, 2007). With more than 46 million people looking for job openings online (Pew Internet, 2006), it is no surprise that many organizations, both large and small, are turning to online recruitment. Organizations are utilizing the Web as a way of attracting candidates, and they are also using Web-based HRIS to support the recruiting process (Figure 10.1).

Although there are certainly a number of benefits associated with using online recruitment, there are also several issues that need to be considered before organizations adopt this strategy. For instance, is online recruitment a win-win situation for both job applicants and organizations? A good way to answer this question is to step back and examine the degree to which online recruitment (a) enables organizations to meet their recruiting objectives and (b) provides applicants with the means of obtaining jobs. We discuss these issues in the following sections.

The Impact of Online Recruitment on Recruitment Objectives

Research by Breaugh and Starke (2000) has identified a number of objectives for the recruitment process, including (a) cost, (b) speed of filling job vacancies, (c) psychological contract fulfillment, (d) satisfaction and retention rates, (e) quality and quantity of applicants, and (f) diversity of applicants. To what extent does online recruitment help organizations meet each of these objectives?

Figure 10.1 Screen Shot of Current Applicant Form



Source: © SuccessFactors, Inc. All Rights Reserved.

Note: Applicant records shown are fictitious examples.

Recruitment Objective: Cost of Filling the Job Opening

One important recruitment objective that organizations constantly strive for is to minimize the cost of filling job openings (Breaugh & Starke, 2000). Research has consistently shown that online recruitment does reduce costs (Buckley, Minette, Joy, & Michaels, 2004; Cappelli, 2001; Chapman & Webster, 2003; Galanaki, 2002; Lee, 2005). For example, one study shows that organizations saved 95% of recruitment costs when they used online recruitment as opposed to more traditional methods (e.g., newspaper ads). Other estimates reveal that the cost of traditional systems of recruitment was $8,000 to $10,000 per position compared with $900 for online recruitment (Cober, Brown, Blumental, Doverspike, & Levy, 2000). This cost difference has prompted many organizations to replace or supplement more traditional systems with online recruitment systems. So it appears that online

recruitment can save companies money when compared with traditional methods, but do these cost savings apply to all organizations? The answer is, not necessarily.

The evidence just presented is quite enticing and would probably persuade most organizations to jump into the online recruitment arena; however, before doing so, decision makers should examine the specifics of their recruitment situation and not just assume that online recruitment saves money for all organizations. First, HR professionals need to consider whether or not online recruitment is appropriate for their company. More specifically, organizations need to plan how to process resumes and screen out those applicants who do not possess the qualifications needed. Failure to think through the entire process may generate greater administrative burdens for the HR department or department managers (Chapman & Webster, 2003; Russell 2007). These burdens would definitely cut into any cost savings produced by online recruiting. A good example is found in an article written by Seminerio (2001), which profiles the **online recruiting** efforts of Sutter Health, a nonprofit health care network. Sutter Health decided to post jobs online to facilitate its recruitment process. The use of online recruitment generated an enormous number of resumes—more than 300,000—for fewer than 10,000 open positions. In most situations, this is something an organization would desire; however, Sutter Health failed to think past the generation of applicants. Managers had not planned how they would accommodate such a large volume of resumes in terms of processing and screening of applicants. Although, in this case, resumes were received quickly, they often sat for weeks on end before processing and selection occurred. Sutter Health quickly realized its error in planning and that the organization needed to revamp the use of online recruitment to serve its needs better.

In addition, organizations also need to track the effectiveness of the online recruitment method through the assessment of yield ratios and placements made. When dealing with a website for recruiting, you may find it useful to monitor the numbers of hits your company’s websites are receiving on career pages. However, the number of hits on a website is only one small component in measuring effectiveness (Cober et al., 2000). For example, a recent study examined the sources job seekers were currently using for new

opportunities and how they actually found their present positions (Stevens, 2007). The results showed that over 90% would use or were actively using online sources to find work. The study further reported that only 30% found their present positions through online means. In an additional study, conducted in the United Kingdom, large organizations with 5,000 employees or more were surveyed about the effectiveness of online recruitment (Reed Company, 2003). The results of the study show that about 40% of the organizations consider online recruitment to be a more effective means than any other traditional method of recruitment. These results imply that organizations need to track the outcomes (e.g., successful placements) of using online recruitment and compare these outcomes with those achieved by other recruiting methods.

Thus, although some research shows that online recruiting may result in cost savings, other research shows that the use of online recruiting may generate a large number of applications, which may result in quite an administrative burden for organizations. As a result, organizations need to consider the overall costs associated with the entire recruitment process before implementing these new systems.

Recruitment Objective: Speed of Filling Job Vacancies

Another recruitment objective for assessing the effectiveness of recruitment is the speed of filling the job vacancy (Breaugh & Starke, 2000). Research has shown that online recruitment can decrease cycle time and increase the efficiency of the process by allowing organizations to spend less time gathering and sorting data (Cardy & Miller, 2003; Chapman & Webster, 2003; Cober, Brown, Levy, Keeping, & Cober, 2003; Lee, 2005; Web Recruiting Advantages, 2001, as cited in Braddy, Thompson, Wuensch, & Grossnickle, 2003). One estimate indicated that online recruitment can decrease hiring cycle time by 25% (Cober et al., 2000). Another study using data from 50 *Fortune* 500 companies showed that the use of online recruitment reduced their average hiring cycle time of 43 days by six days and allowed them to cut four days off the application process (Recruitsoft/iLogos, cited in Cappelli, 2001). Another study at Cisco Systems

found that online recruitment allowed the company to fill job openings quickly. When Cisco Systems adopted online recruitment, the company attracted more than 500,000 individuals in one month, which enabled them to hire 1,200 people in just three months (Cober et al., 2000).

It is evident from this brief review that online recruiting can decrease the cycle time and enhance the speed with which vacancies are filled, but this leads to other questions that need to be answered. Does this speediness enable organizations to hire the most qualified employees? Do these hires remain with the organizations? What is the diversity of these new hires? These questions and others need to be examined further to determine whether certain disadvantages of online recruiting may offset the benefits of the shortened hiring cycle.

Recruitment Objective: Psychological Contract Fulfillment, Employee Satisfaction, and Retention Rates

Psychological contract fulfillment, employee satisfaction, and retention rates are three other important goals of the recruitment process. These three goals have a close relationship. The psychological contract refers to the employees' beliefs about the reciprocal obligations and promises between them and their organizations (Morrison & Robinson, 1997). Not surprisingly, when employees believe that their psychological contracts with the organization have been breached, they are more dissatisfied and more likely to leave the organization (Rousseau, 1990). Thus, it is important to explore the extent to which online recruitment can help ensure that employees' psychological contracts are fulfilled.

The information gathered and disseminated during the recruitment process shapes the expectations that lead to psychological contract fulfillment, which directly affects employee satisfaction and retention rates (Breaugh & Starke, 2000). There are numerous types of expectations that shape the psychological contract. These expectations include the work role (skills use, job performance), social relations (coworker and customer interactions), economic rewards (raises, monetary incentives), and company culture (Baker,

1985). So let's look at one factor, corporate culture, to provide an example. Chen, Lin, and Chen (2012) found that online applicants' perceptions of organizational culture positively influence the perception of their fit with the organization and the choice of organization to work. In addition, Braddy, Meade, Michael, and Fleenor (2009) found websites that incorporated culture-specific, or relevant, testimonials would more strongly convey culture perceptions to viewers than would websites containing null testimonials and policies. The use of online recruitment can truly impact the psychological contract. Therefore, it is critical during the recruitment phase that both the potential employee and the employer communicate what these expectations are and recognize whether this employment relationship will be able to meet the expectations of both parties (Baker, 1985).

Information that is provided by the applicant and by the recruiting company is a crucial part of the recruitment process. Oftentimes, the recruitment process is rushed by the recruiters, who want to complete the task of filling job openings. When a process is rushed, job seekers may find incomplete or vague information regarding job openings and company expectations. Furthermore, when job seekers receive sugarcoated information from recruiters that exaggerates the opportunities and provides unrealistic expectations about the company, then the expectations of employees are incongruent with those of the organization. Inaccurate, overly optimistic, or vague information is something organizations need to minimize or avoid. The use of such information can often lead to unrealistic expectations about the psychological contract between the organization and the individual. This circumstance is problematic for organizations because the new hires may begin to see the inconsistencies between their actual experiences and their expectations, which were formed throughout the recruitment process, and feel that their psychological contracts have been breached by their employer. Violations of the psychological contract can often result in negative attitudes and behaviors and higher levels of employee dissatisfaction and, eventually, will lead to greater turnover (Morrison & Robinson, 1997). Therefore, organizations really need to monitor and distribute accurate and timely information to potential job seekers to avoid such problems in the workplace.

Given that numerous companies now have their own websites, which contain a job page and endless space to provide information, more realistic

information can be offered to job seekers. In addition, since the information is posted in real time, changes in content can be made at a moment's notice so that information is up to date and accurate. Therefore, it is no surprise that applicants rely more on posted information to form their expectations about the job and the company. Allen, Mahto, and Otondo (2007) found the amount of company information found on their website is positively related to job seekers' attraction to the organization. They also found the amount of job and company information provided on the company website is positively related to attitude toward the website.

Thus, employers can use websites to help provide realistic expectations about their companies and form psychological contracts. Companies really need to make sure that the message being conveyed on their websites is producing the psychological contract that can be fulfilled for both the employees and the employer. Once again, because the fulfillment of the psychological contract affects satisfaction and turnover levels, it is worthwhile for companies to convey realistic information about what new hires should expect and what will be expected of them—these expectations form the basis of the psychological contract. The use of a realistic recruitment message and the employment brand message should be the focus.

Realistic Recruitment Message

A realistic recruitment message is one that describes the organization and the job as they truly are without sugarcoating (Heneman & Judge, 2006). One important tool many organizations use is the realistic job preview. A **realistic job preview** shows applicants the positive and negative attributes of a job they are applying for to see if this job is truly what they desire or thought it was (Wanous, 1992). Realistic job previews can be communicated through written information that is posted on the employers' websites, but more and more companies are using video clips or Webcams that allow candidates to view what it is like to work for the organization in real time. One example is found at Target, a large retail organization, which posts video clips on its website, so you can see what working there is like (http://sites.target.com/site/en/company/page.jsp?ref=nav_footer_careers&contentId=WCMP04–030796). Some companies are taking this a step further by allowing some kind of interaction with current

employees so applicants can gain realistic information about what it is like to work for the company. One example of a company that uses this feature is Cisco Systems, which offers online applicants a chance to “Make a Friend at Cisco.” This allows the applicant to communicate with someone inside Cisco, who can describe what it is like to work for the organization (Cascio, 1998). Another interesting example is found at McKinsey & Company. On their website, they provide an in-depth look at what you will do on the job by showing various employees with various job titles and their typical week activities in great detail (McKinsey, 2012).

In addition to realistic job previews, organizations are also using the unlimited space on their company websites to provide a **realistic culture preview** (Cober et al., 2003; McCourt-Mooney, 2000). A realistic culture preview allows an organization to expand beyond the traditional job information and provide information about the company philosophy, value systems, history, diversity, salary structure, and benefits. This information could be vital for constructing realistic expectations in forming the psychological contract. An interesting example can be found at Accenture’s website in the career section (www.careers.accenture.com/us-en/working/overview/pages/index.aspx). Accenture provides detailed information about its core values, focus on teamwork, investing in training and development, providing a supportive work environment, and sharing their skills in the community. This company definitely provided information beyond the basic job and company information and would help to gauge if one should apply to such a place.

Research has shown that the availability of particular information (e.g., advancement opportunities, salary) can have a positive impact on applicants’ attraction to an organization (Cober et al., 2003; Mohamed, Orife, & Wibowo, 2002). The use of a realistic culture preview is also helpful since often applicants seek out jobs and organizations that best fit their own personal values and beliefs (Dineen, Ash, & Noe, 2002). Providing this information about corporate culture could help develop a better relationship between the organization and the applicant and could lead to the building of trust between the applicant and the organization, which is key in the psychological contract. In addition, if the company fits the applicants’ values and beliefs, they may experience higher satisfaction and stay with the

company longer. Since research has shown that applicants feel that they have a better chance of collecting realistic information from websites than from traditional sources (Rozelle & Landis, 2002), online recruitment is a critical recruitment tool.

Overall, the use of realistic recruitment messages in online recruitment should enable organizations to increase the degree to which employees perceive that their psychological contracts are fulfilled and should also enhance satisfaction and retention levels. Realistic recruitment messages should not only help organizations attract applicants who possess the skills and values that are aligned with those of the company, but also communicate what employers are looking for in candidates applying for job openings. This communication could potentially help applicants construct realistic expectations, which could lead to a well-developed psychological contract that could be fulfilled in the future on the job if candidates are selected for positions. The fulfillment of the psychological contract could lead to a long and productive relationship for both the employee and the employer, so satisfaction and retention rates could be increased.

Employment Brand Messages

A company's **employment brand** can be a powerful tool to attract applicants to its website. A company's employment brand is often based on the organization's well-known values or distinctive image and culture (think Southwest Airlines or Apple). A company often sets itself apart from competitors by means of its employment brand (Stone, Stone-Romero, & Lukaszewski, 2003; Ulrich, 2001) or uses the brand to help create a particular image in hopes of attracting job applicants (Galanaki, 2002). For example, Cisco Systems uses its image of being technologically advanced and, therefore, relies only on recruitment through the Internet to fill openings (Cascio, 1998).

Research shows that the use of online recruitment can help some organizations create a specific brand identity in the labor market (Chapman & Webster, 2003; Ulrich, 2001). One unique example is found on the Johnson & Johnson website (http://careers.jnj.com/home). The firm brands itself as having a "small-company environment, big-company impact philosophy"—

to attract individuals who are familiar with the Johnson & Johnson brand but don't want to get lost among numerous employees. In addition, the current brand or reputation is another way that companies can lure applicants to their job pages, by simply linking employment opportunities to their products and services. Doing this is quite helpful in attracting applicants who are familiar with the company's products but possibly never thought about the company's employment opportunities.

Overall, the employment brand may be an important determinant of applicants' attraction to organizations and of subsequent satisfaction and retention rates. If a person believes in and identifies with a particular company, he or she may find fulfillment and satisfaction and stay there if extended a job opportunity. However, more research is needed in this area to examine the direct impact of this type of message.

Recruitment Objective: Quantity, Quality, and Diversity of Applicants

The quantity, quality, and diversity of applicants are three other important recruitment objectives (Breaugh & Starke, 2000). Each topic will be discussed in greater detail.

Quantity of Applicants

Online recruitment is extremely convenient for applicants and is available to them 24 hours per day and seven days a week. It also allows them to fill out an online application or upload a resume for various positions in a matter of seconds. Although this convenience can be very beneficial, it may encourage applicants to apply for jobs without assessing their own qualifications for each job, which can result in a large number of applicants for every job opening (Chapman & Webster, 2003). To offset this volume, organizations need to put into place methods to screen out applicants who are not qualified. Many organizations are using resume management systems that allow for keyword searches (i.e., of specific degrees or skills) to scale down the large volume of applications. However, some caution needs to be taken when using keyword searches. Applicants may tailor the content of their resumes to the

words in the job descriptions to enhance their chances of passing through the resume-screening systems (MacMillan, 2007; Mohamed et al., 2002), which may result in the selection of those who use the right words but are not necessarily the most qualified for the job. Therefore, organizations using online recruiting need to be concerned with the quality of the numerous applications received.

Quality and Diversity of Applicants

Two other important goals of the recruitment process are to generate highly qualified applicants with diverse backgrounds. The quality and **diversity of the applicant pool** are determined by the users of online recruitment. Some research indicates that online recruitment systems place artificial limits on the applicant pool. Most applicants who typically use online recruitment are computer-literate, well-educated, driven individuals with a high need for achievement, seeking relatively high-level jobs (McManus & Ferguson, 2003). However, research also shows that these applicants are more likely to be job hoppers than those who do not use online recruitment (McManus & Ferguson, 2003). In addition, online recruitment users often have low levels of computer anxiety or high levels of computer self-efficacy (Marakas, Yi, & Johnson, 1998). Research has also found that college students preferred online recruitment methods as compared with other recruitment methods such as newspapers or television (Zusman & Landis, 2002).

Although online recruitment appeals to fairly well-educated applicants, research shows that there are also ethnic differences in the use of online recruiting, with these initiatives attracting 7% of Hispanics, 9% of blacks, and 16% of whites (Kuhn & Skuterud, 2000). However, the research findings on ethnicity and online recruitment usage have been somewhat contradictory. For example, one study found that African Americans often react quite favorably to online recruiting and use it to self-select themselves out of the application process for a poor fit job or organization (McManus & Ferguson, 2003). Some possible explanations for the low Internet usage of various groups include lack of access to computers, lack of computer skills, and poverty (Kuhn & Skuterud, 2000). Others have argued that cultural differences in relationship orientation may affect Hispanics' use of online recruiting systems (Stone, Lukaszewski, & Isenhour, 2005).

There are also gender and age differences in responses to online recruitment. Employed men are more likely to search for jobs on the Internet than employed women (Kuhn & Skuterud, 2000). The reason for this may be that females generally have more computer anxiety and lower computer self-efficacy than males (Jackson, Ervin, Gardner, & Schmitt, 2001).

Research has also shown that older individuals (55 or above) tend to have lower computer self-efficacy (Reed, Doty, & May, 2005) than younger adults, which may inhibit older applicants' ability and perceived ability to use online recruiting. Given these findings, it is clear that the use of online recruitment may limit the extent to which an organization attracts qualified women, Hispanic Americans, and older workers.

Thus, if an organization relies only on Web-based recruitment, the system will indirectly influence the overall composition of the workforce and decrease the level of diversity within the organization (Stone et al., 2005). Therefore, online recruiting may facilitate workforce homogeneity and, as a result, hinder innovative and creative decision making (Schneider, Goldstein, & Smith, 1995). Organizations must be aware of the potential biases created by their recruiting practices and align their recruiting strategies with their overall business strategies to create competitive advantage (Becker & Gerhart, 1996; Wright & Snell, 1998). For example, if an organization wants to hire an individual for an HRIS-related job, the organization may find Web recruiting to be a cost-efficient and effective source of recruitment because members of the applicant pool are technologically proficient and would most likely use the Web in their job searches. Conversely, if the organization is looking for a person in a nontechnical position (e.g., staff writer, creative consultant), then the use of traditional recruitment sources may be more effective than the use of online recruitment alone.

Overall, it is apparent that online recruitment may help organizations meet the objective of increasing the number of job applicants (Chapman & Webster, 2003; Galanaki, 2002). However, it is not clear whether the use of online recruitment will help organizations attract high-quality applicants. If an organization is looking for job applicants with particular skills (e.g., computer skills), then it may be able to find and attract such applicants with online recruitment. However, the use of online recruitment may also result in

some dysfunctional consequences. For instance, online recruiting may attract job hoppers and may be less likely to attract those with low levels of computer self-efficacy. Furthermore, online recruitment may have a negative impact on the extent to which organizations are able to attract women, older workers, and some minorities (e.g., Hispanic Americans). However, research is not clear about the extent to which online recruitment helps organizations attract African Americans. Further research is needed on this topic.

Organizations need to be very cautious about using only online recruitment, especially since this recruitment method may not help organizations meet their diversity-related goals. There is clearly potential for an adverse impact on the number of applications received from women, minorities, and older workers, which may pose potential legal problems for organizations (Hogler, Henle, & Bemus, 1998). Therefore, it is important that organizations consider the potential legal issues associated with the use of online recruitment and ensure that all qualified applicants are given the opportunity to apply for jobs (Stone et al., 2003). Furthermore, organizations may want to use online recruitment in conjunction with other recruitment sources (e.g., newspaper ads, job fairs) to ensure that their recruitment processes are fair.

Attributes of the Recruiting Website

Another factor that may affect the acceptance and effectiveness of online recruiting is the design of the website. In general, the best website design is user-friendly in that users can easily navigate and browse through multiple Web pages to find information. The extent to which the website is usable or not has been referred to as “website usability” in the empirical literature (Cober et al., 2003; Karat, 1997; Nielsen, 2000). The construct of website usability has been conceptualized as encompassing a number of dimensions, including navigability, content information, and aesthetic features. Each dimension and its use in recruitment are further discussed in this section.

First, **navigability** can be defined as the overall ease with which a user can browse through multiple Web pages to locate topics of interest. Hosting a website that displays current information and includes active hyperlinks to retrieve information is essential in maintaining user interest within the site. To achieve this goal, organizations should follow the “three-click” rule for

users to locate information of interest. For instance, users who wish to browse job opportunities on the organization's website should be able to reach the desired Web page by the third hyperlink from the home Web page. Accordingly, research has shown that applicants have more favorable impressions of an organization when its website is easy to navigate as opposed to being difficult to navigate (Braddy, Meade, & Kroustalis, 2008). Such favorable impressions are important to elicit within applicants because they may lead to greater organizational attraction (e.g., Allen et al., 2007; Lyons & Marler, 2011).

Next, **content information** refers to the degree to which the website hosts relevant information that the user deems valuable and informative in nature. Providing information that the user desires is another mechanism by which organizations can sustain user interest and satisfaction with the website. The **media richness** theory (Daft & Lengel, 1986) has been frequently applied to explain why hosting relevant content information is beneficial to applicants. Specifically, this theory contends that communication effectiveness is a function of the degree to which media sources reduce user uncertainty and equivocality (Daft & Lengel, 1986). Rich media sources (a website) contain enough relevant and accessible information to reduce user uncertainty and subsequent anxiety toward the target source (an organization). Conversely, when a source has a low degree of richness, inadequate information fails to reduce users' uncertainty about the organization, which may then lead to ambivalence and anxiety toward the target source. The result of this process may stimulate positive or negative attitudes toward the organization, such as more favorable impressions of an organization's image (Cable & Yu, 2006). Thus, an organization would be advised to host a website that includes information about the organization and its products, available job opportunities, developmental opportunities, compensation, and culture (Barber & Roehling, 1993; Cable, Aiman-Smith, Mulvey, & Edwards, 2000; Cable & Graham, 2000; Judge & Cable, 1997). For example, Walker, Field, Giles, Armenakis, and Bernerth (2009) found when organizations posted employee testimonials on their employment Web pages, their sites generated greater organizational attraction than other websites that did not have such testimonials. Consequently, hosting information that applicants value will most likely facilitate person-job (P-J) and person-organization (P-O) "fit"-related decisions.

Specifically, when applicants perceive similarity between their qualifications and what is required by the job (P-J) and between their personality and the organization's values (P-O), it is more likely that they will pursue employment with the organization (e.g., Kristof-Brown, Zimmerman, & Johnson, 2005). Indeed, perceived fit has been found to be one of the strongest predictors of organizational attraction (Uggerslev, Fassina, & Kraichy, 2012). Overall, these applicant-evaluative processes cannot be formed if the organization does not include useful information on its website. For example, many organizations (e.g., Texas Instruments) provide a list of cultural values on their employment Web pages. It is important to note, however, that the more customizable information an organization provides on its Web page, the more likely an applicant will engage in appropriate **self-selection** behavior (to apply or not apply for a job within the organization). In other words, if the website provides direct feedback to applicants regarding their P-O or P-J fit, the online recruiting effort will likely attract a more qualified applicant pool (Dineen et al., 2002; Dineen, Ling, Ash, & DelVecchio, 2007; Dineen & Noe, 2009). Therefore, to avoid the "dark side" of Web recruitment, an organization must first determine and maximize the information that is most likely going to influence fit perceptions and then engage the user to seek and understand this information. For example, professional sports teams who advertise job openings on a third-party website, www.teamworkonline.com, frequently have potential applicants respond to a few P-J fit-related questions before they are allowed to apply for the job in question.

Finally, companies should consider how the **aesthetic features** of their websites engage user interest and attention. These features encompass the overall stylistic or innovative aspects of a website, such as contrasting colors, pictures, animation, and playfulness, which keep the user engaged while he or she navigates through multiple Web pages (Cober, Brown, Keeping, & Levy, 2004). When a user is engaged, it is more likely that he or she will maintain interest in the organization and browse for more information about the organization (Cober et al., 2003). Ultimately, an applicant may perceive these innovative features of a website as "signals" about broader organizational attributes, such as the organization's culture and image (Lyons & Marler, 2011). For example, if a website has attractive stylistic features (e.g., Goldman Sachs's website, www.gs.com), it may stimulate more

favorable perceptions of organizational image, which has been found to be positively related to organizational attraction (Lyons & Marler, 2011). These results are especially important for entrepreneurial or smaller firms that wish to attract qualified applicants to their organizations. That is, when an organization invests in the latest Web design, a user or applicant will be more likely to perceive that organization as reputable. Similarly, an information technology (IT) firm would be wise to invest in the latest Web design software to generate applicant or even customer perceptions that the organization values innovation and creativity. This investment is especially prudent from the perspective that this firm's potential applicants will most likely be attracted to an organization that values innovation and creativity.

Integrating these attributes together, a website's **usability** has been found to affect applicant perceptions and attitudes toward the organization. A recent meta-analytic study by Uggerslev et al. (2012) found a corrected correlation coefficient of .41 between website usability and organizational attraction—in other words, the more usable the website was perceived, the more likely the applicant was attracted to the organization. A study by Allen et al. (2007) found that website **attributes** were positively related to applicants' intentions to pursue employment, which is the immediate precursor to the actual behavior of applying for a job within an organization. Toward this end, in a sample of U.S. state government recruitment websites, Selden and Orenstein (2011) determined that website usability was positively related to applicant pool quantity (i.e., total number of applicants). All these studies converge on the finding that website usability perceptions influence applicant attitudes toward an organization. As a result, organizations should be attuned to how their websites influence applicant perceptions and be prepared to update their Web design to embody high navigability, content fidelity, and engaging aesthetic features. HR and IT employees should monitor the usability of their firm's website by surveying applicant perceptions of and reactions to the Web recruiting process, especially in situations where the Web recruiting function entails gathering applicant data and preliminary online ability testing.

The decision to host job openings on organizational websites and to have the capability of screening job applicants for positions should be based on the firm's resources and strategy. With this statement in mind, we can see that

the purpose of an organization's recruitment website can be classified as either recruiting and screening oriented or as just recruitment oriented (Williamson, Lepak, & King, 2003). A **recruiting- and screening-oriented website** has the capability to list job openings and accept applications through a secure server. Conversely, a website that focuses only on recruiting just hosts a list of job openings with the option of submitting an application via mail, e-mail, or fax to an organizational representative. Williamson et al. (2003) articulated that both recruitment orientations can be effective in attracting applicants; however, it could be contended that applicants may prefer submitting personal information through websites that they perceive to be secure and trustworthy (Stone et al., 2003). Therefore, if an organization does not have the financial resources to invest in building a secure server to accept applications, an alternative would be to still offer information about the organization and its culture on the website's employment Web page and then have a hyperlink that connects interested applicants to jobs that are hosted by a third-party vendor, such as Monster.com. A more logical alternative would be to host an organization's job opportunities on a third-party vendor's website (e.g., Monster.com, Careerbuilder.com) and include a hyperlink on each announcement that connects the applicant to the organization's home Web page. These alternatives would allow the organization to achieve the benefits associated with Web recruiting and provide the applicant an opportunity to learn more about the organization by browsing the firm's home Web page. Also, from the applicant's perspective, these options would reduce any anxiety or adverse perceptions about lack of privacy or about Web security concerning those organizations that the applicant does not know well or does not entirely trust.

Recruitment Strategies and Social Networking

Organizations have always used social relationships and networking, including employee referrals, to attract talent. Increasingly, social networking sites such as Facebook, Twitter, and LinkedIn are gaining in use and popularity, and they now provide a unique method of allowing recruitment professionals to source, contact, and screen both active and passive job candidates. For example, domestically in the United States, United Parcel Service (UPS) uses Facebook, Twitter, LinkedIn, and Google Plus to post job openings and host relevant information about the company and its culture

(Zielinski, 2012). Internationally, the Hard Rock Café solely used Facebook as a recruiting source to hire 120 employees for a new restaurant in Florence, Italy (Colao, 2012). Although there are benefits to using social networking sites for recruitment and selection purposes, there are also concerns regarding its proliferation, targeted applicant pool, use in selection, saliency of more negative profile information than positive, and merit as a worthwhile recruiting source. For a further discussion about the role of social media recruitment, please refer to Chapter 16.

The Relationship of e-Recruiting and HRIS

The applicant's information acquired through the company's online recruitment can be funneled into the company's HRIS. The use of the HRIS in the recruitment process can make the process more efficient and effective by having information readily available and usable at a moment's notice. Many of the suggestions made in the above sections are illustrated here. One important function the HRIS provides is applicant tracking. Applicant tracking allows for the generation of applicants' profiles, which are compiled through application blanks and/or resumes. These profiles can aid the hiring manager in their employment decisions. Recruiters or the hiring managers can perform key word searches to find qualified applicants for available jobs. Applicant tracking also allows recruiters, hiring managers, and sometimes the applicants themselves, to see where they are in the recruitment process. The HRIS can provide information about the yield ratios for each recruiting source, cost- effectiveness of the recruitment process as a whole or by recruitment source, and to support equal employment opportunity/affirmative action analyses. Applicant data can be also stored and searched for future vacancies. Lastly, when applicants become new hires the HRIS provides the data to populate the core HR system and other HR purposes, such as payroll and benefits.

Online Recruitment Guidelines

Stone et al. (2005) offer the following research-based guidelines on the effective design and use of online recruitment strategies:

- Online recruiting is more suitable for well-known firms with excellent employer branding.
- It should be used as one of many sources of recruitment.
- It is more suitable when many candidates are needed for high-level jobs requiring high levels of education.
- Organizations should be aware of the limitations of this method, such as its limited ability to attract highly qualified candidates and minority candidates. It may in fact attract job hoppers.
- The websites should be easy to use and navigate and designed to attract, not screen, candidates.
- Online screening systems should be based on job analyses.
- E-recruiting systems should provide realistic previews of jobs and of the firm.
- Effectiveness should be regularly reviewed and continuously improved based on feedback from job applicants.
- Online recruiting should be culturally sensitive and suit people from diverse backgrounds, including those with low education levels and low computer self-efficacy.
- Online recruiting must incorporate privacy protection policies, including those limiting the collection of information to only employment-specific data and those restricting access to and distribution of such data.

In summary, organizations should consider the extent to which online recruitment enables them to meet their recruitment objectives. Our previous discussion provides evidence that online recruitment can help organizations reduce the costs of recruiting, decrease the cycle time of filling job vacancies, and generate large quantities of applicants. However, organizations must remember that these are not the only recruitment objectives and must focus on finding the impact of online recruitment on the other recruitment objectives (quality and diversity of applicants, psychological contract fulfillment, employee satisfaction, retention rates). In addition, the attributes of the website can affect the acceptance and effectiveness of online recruiting. The best website design is user-friendly in that users can easily navigate and browse through multiple Web pages to find information that is valuable and conveys whether or not the applicants fit not only the job requirements, but also the organization’s value system. Last, the aesthetic features of a website, combined with the content presented, may shape the

attributions of job seekers toward the organization in a positive manner. However, the attraction of applicants to job openings is only the beginning—organizations now have to focus on assessing the applicants who constitute their applicant pools. Therefore, we now need to switch our focus to a discussion of selection.

Selection and Technology

This section focuses on tests and assessments of individual employees and candidates, which underlie the evaluation processes that enable organizations to manage their talent. These tools are used for selecting employees, as well as placement, training and development, promotions, and evaluations. Tests and assessments are important for HRIS because they provide data that are used for making organizational decisions. To explore the data-based decision-making process in further detail, we focus our discussion on the use of tests and assessments to make a critical decision—whether or not to hire a particular candidate.

What Are Selection Tests and Assessments, and Why Are They Used?

Most organizations that seek HRIS expertise on selection will likely consider the term *test* to refer to traditional multiple-choice examinations that can be used to measure ability, personality, or knowledge, as well as to skills tests, such as typing tests. Organizations seeking assessments may be referring to these same tests, or, alternatively, they may be thinking of different types of **selection procedures** and tools, such as reference checks or work samples. Whatever the label, tests and assessments are job-related decision-making tools that provide information about candidates, information that organizations can use in selection. Figure 10.2 contains examples of the major tests and assessment instruments. For this section of the chapter, we use the terms *test, assessment, selection tool,* and *selection procedure* interchangeably to refer to any tool designed to measure attributes of individuals for the purpose of selecting employees.

Here is a more comprehensive list of assessments, as provided by the Society

for Industrial and Organizational Psychology (SIOP):

> Selection procedures refer to any procedure used singly or in combination to make a personnel decision, including, but not limited to, paper-and-pencil tests, computer-administered tests, performance tests, work samples, inventories (e.g., personality, interest), projective techniques [ambiguous stimuli such as inkblots or pictures, often used for personality assessment], polygraph [lie detector] examinations, individual assessments, assessment center evaluations [summaries of multiple assessments, as evaluated by multiple raters], biographical data forms or scored application blanks, interviews, educational requirements, experience requirements, reference checks, background investigations, physical requirements (e.g., height or weight), physical ability tests, appraisals of job performance, computer-based test interpretations, and estimates of advancement potential. (SIOP, 2003, p. 3)

Figure 10.2 Specific Examples of Tests and Assessments

Knowledge test: A multiple-choice training posttest of knowledge of the tools, machines, and equipment used in a factory and designed to measure how well the new hire has learned essential job information taught in classroom training.
Skill test: A practical exercise or simulation that tests the candidate's effectiveness in using Microsoft Word software.
Ability test: The Watson-Glaser Critical Thinking Appraisal, a multiple-choice reasoning test, in which the examinee reads a short or medium-length passage and draws logical conclusions about the statements, choosing the answer that makes the best logical sense. Many other ability tests are similar in appearance and format to educational tests that are familiar to students (e.g., the Scholastic Aptitude Test [SAT], the Miller Analogies Test [MAT], and the Graduate Record Examination [GRE]).
Personal attributes test: A multiple-choice personality assessment in which the examinee reads statements such as "I enjoy making presentations in front of large groups of people" and indicates the extent to which she or he agrees or disagrees with these statements. Results are scored on several scales or dimensions.
Work simulation: An in-basket exercise in which the examinee must examine the variety of types of information (correspondence, reports, and other information) and also interact with simulated coworkers, employees, or other business associates (whether computer simulated or role-played by actors over the telephone or in person). The examinee is evaluated on a variety of dimensions, from accuracy and the quality of decisions to work-related competencies, interpersonal skills, and other personal attributes.

Why Is Understanding Assessment Important for HRIS?

When used for employee selection, assessments have value because they assist organizations in identifying those individuals who are more likely to succeed on the job and prevent the hire of those who are less likely to succeed. HR managers need to understand the purpose and use of assessments for a variety of reasons, including the following:

- All organizations use assessments.
    - Organizational leaders know that employees' abilities, skills, and personal attributes are critical for success.
    - Nearly 60% of large U.S. employers used pre-employment assessments in 2013, up from 26% in 2001 (Weber, 2015).
- The value of selection is quantifiable.
    - *Some selection systems work better than others.* Effective assessments must be valid, provide information that is clearly related to their intended use, and the information must be related to the job's requirements.
    - Unfortunately, some commercially available assessments are poorly designed and researched, and their creators may make unjustifiable claims about their effectiveness.
- Employee selection is regulated by antidiscrimination laws.
    - These laws prohibit employment practices that unfairly discriminate against people in various protected groups, such as racial/ethnic minorities, women, and older candidate. HRIS experts must be aware of these **antidiscrimination laws**.
    - In order to be fair and legal, selection decisions that differentially affect protected group members must provide equal treatment and be equally predictive of success for minorities and other protected groups.

Although this chapter will address a variety of important concepts about selection and assessment for personnel decision making, a full discussion is beyond the chapter's scope. Interested readers are encouraged to consult additional sources, including the SIOP document. We also recommend a text by Guion (1998) and Farr and Tippins's (2010) employee selection

handbook, two of the essential references on the topic. The U.S. Department of Labor (1999) offers a less technical summary white paper, and the SIOP website (www.siop.org) provides links to many useful websites and papers.

Technology Issues in Selection

The most common use of technology for selection systems is the use of computers to administer and score tests. HRIS experts need to be aware of several general concerns about the computer administration of selection procedures. First, does mode of administration of an assessment—in particular, the devices used, such as paper-and-pencil, computer, tablet, or smartphone—affect the measurement properties of the test? Second, as computing capabilities increase, it is possible to make assessments that more closely simulate the job, that is, ones that closely approximate the work that would be done once the candidate is hired. What are the benefits and risks of high-fidelity work simulations? Third, how does online testing affect the validity of selection systems? Does the technology that allows candidates to take tests anywhere, and organizations' increasing interest in using that technology, compromise the test security that is present in traditional settings with proctored examinations?

Equivalence Between Modes of Assessment

Most of the first **computerized assessments** were meant to look like their paper-and-pencil, low-tech counterparts, except that they were delivered on a computer and required candidates to answer questions (generally multiple choice) via a keyboard or a mouse or to take a computerized skill test (e.g., a typing test). The primary concern, then, was that the mode of administration (paper or computer) might affect the measurement properties of the test, such that a score taken on paper might not be equivalent to a score taken on a computer. Today, the availability of different computing devices (laptops, tablets, smartphones, watches) amplifies concerns about equivalence for certain types of assessments, and requires the HRIS expert to know when caution is warranted about interpreting test scores from different devices. For some types of assessments, most researchers have little concern that the mode of administration will result in a different measure. For example, for

personality tests and career interest inventories, for which job candidates answer questions at their own pace about their beliefs and characteristics or their interests in different types of work, the presentation format of the questions is expected to matter little (for example, see Tippins, 2015). On the other hand, there is clear evidence that the mode of administration matters for certain types of **ability tests,** particularly **speeded tests,** which are time-pressured, such that candidates may not finish all the items in the allotted time (e.g., see Mead & Drasgow, 1993; Potosky & Bobko, 2004). For such tests, the physical or virtual materials and test administration methods affect the time (in seconds) it takes to complete a test item and, thus, the results. For instance, think of a paper test form that requires a candidate to match questions printed in booklets to an answer sheet; now imagine a computer screen on which the examinee sees one item at a time and uses a mouse to click on the answers. Alternatively, one candidate may take a test on a large screen that displays the entire question at once, whereas another might take the test on a small tablet and may need to use time to scroll down in order to see the whole question. Total scores, average scores, and performance on individual test items may be affected. The more speeded a test is, the more likely it is that there will be differences between the modes of administration. In contrast, **power tests**, tests in which there is no designated time limit to create time pressure or in which the time limit is set such that most candidates will complete the test without working hastily, typically do not show differences between testing modes. Where a difference in scores is expected, an industrial/organizational psychologist or other expert in tests and measurements can conduct a study of the equivalence between the two. The study entails administering both types of tests, ideally to the same individuals, with the order of administration counterbalanced across participants, and examining and comparing the overall results and the statistical results for each item. Then, when necessary, a formula equating the two can be developed to adjust for differences. The result is a method of ensuring that, irrespective of whether the candidate takes the test with one device or another, he or she will have the same opportunity to perform well.

Bandwidth Versus Fidelity: How Closely Should We Simulate the Job?

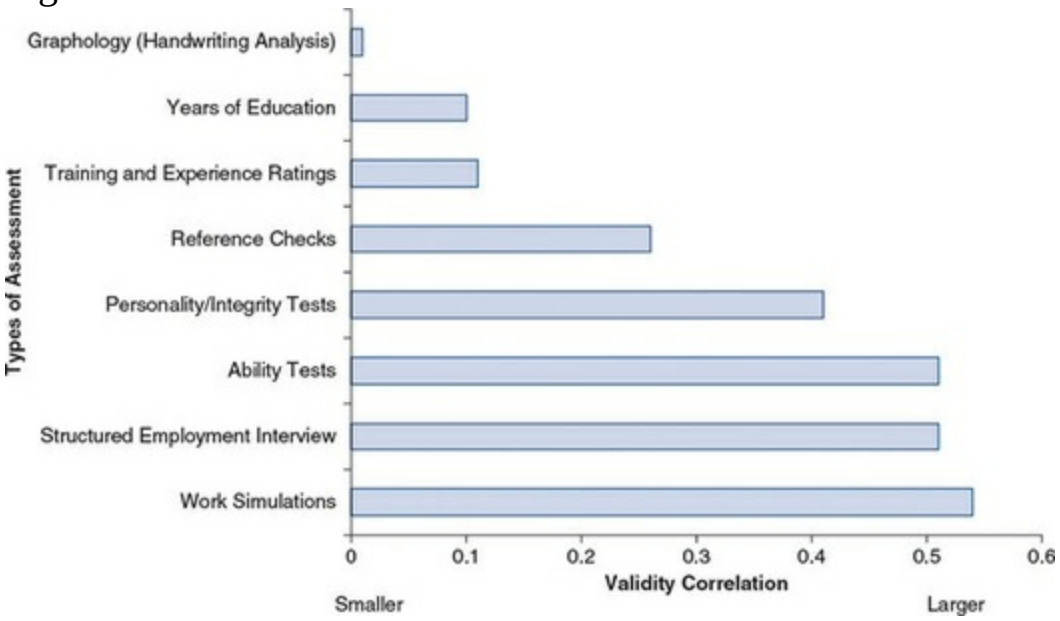
Technology has enabled organizations to create work sample simulations that represent the job with high fidelity. Company leaders may want this because they believe that no assessment could be nearly as good as a simulation that closely matches the work that will be performed on the job. However, as Figure 10.3 illustrates, an analysis of decades of assessment research has found that general cognitive ability tests can, on average, predict success virtually as well as simulations, and, when combined with other types of assessments, they can exceed the predictive ability of simulations. The bar chart in Figure 10.3 displays statistical correlations between assessment scores and job performance data. Schmidt and Hunter (1998) provided these data in a comprehensive meta-analysis, research that quantitatively summarizes the data from many studies on a particular topic—in this case, the personnel selection research literature. The research is most supportive of **work simulations**, ability tests, structured interviews, and personality testing. Higher scores on these types of assessments are predictive of higher job performance. For comparison, less valid assessments are also shown, such as education and training ratings and graphology (handwriting analysis), which has been shown to have little or no validity.

Work simulations give candidates a sense of what it would be like to perform some aspect of the job, such as answering customer service calls and entering client information, or writing e-mails to managers and co-workers. As computing power increases, so does the capacity for more and more realistic and complex simulations, as do the amount and varieties of data that can be collected about the candidate's behaviors during the simulation. Candidates may now operate avatars to move through a game-like virtual environment that not only records their answers to questions or puzzles but also tracks all they items of information they viewed and for how long (see Fetzer & Tuzinski, 2013). This assessment frontier opens new avenues for the HRIS expert to explore the best methods of coding, scoring, storing, and applying the collected data.

It is also important to be aware of the trade-off between **fidelity** and bandwidth, the range of settings to which the simulation might apply. For example, suppose that a management simulation is designed to closely represent a particular line of business in the actual organization chart and reporting structure, as well as the unique subject matter that is addressed in

the management job from day to day. If the company then wants to use the simulation for a different business unit or job, the details that made the simulation highly appropriate in the first setting may interfere with its use in the other setting. The same problem applies to jobs and settings that change over time, as most do. Therefore, although as the HRIS expert you may be adept at creating an assessment that looks just like the job, such a tool might have a narrow range of uses. Also, simulations generally require that the job candidate already knows how to do the job, at least at some basic level, or that the job is simple enough that the candidate can learn the job tasks quickly to perform the simulation. In general, HRIS managers should keep in mind that, depending on the effort and expense one is willing to expend on assessment development and installation, lower-fidelity simulations or combinations of other types of assessments might be preferable to a simulation that is highly job specific and costly.

Figure 10.3 Correlations Between Assessment Scores and Job Performance



Source: Schmidt and Hunter (1998).

Validity and Security Issues Created by Unproctored Online Testing

Numerous consulting companies offer **online tests.** While these tests may be conducted in an office by a proctor who checks identification and monitors the test session, frequently they are delivered in **unproctored testing** (unsupervised) situations. Such testing can be attractive to organizations because of its anywhere-anytime convenience for both the candidate and the hiring organization.

However, this convenience may come at a cost. A panel of industrial/organizational psychologists convened at the annual SIOP conference in 2006 and published an article that summarizes the issues well and describes the opinions of the various members of the panel. These individuals are employed by a range of different types of organizations: a university, several test-publishing firms, the U.S. government, and a publicly held company in the finance industry (Tippins et al., 2006). The issues they identified include candidate identity, test security and cheating, and fair access to testing for minorities. These issues still hold up well today (e.g., Tippins, 2015).

Establishing candidate identity is a straightforward problem, currently without a straightforward solution. There is currently no failsafe method. In contrast to in-office testing requiring identification, when testing is unproctored, someone could be taking the test in the candidate's place. A live video feed or a biometric method of verifying the candidate's identity would provide more assurance, and there are now companies that offer such services. Alternatively, the organization might choose to retest all the candidates who qualify, using a proctored setting. A related issue is **test security**. One facet of this is keeping the test content under lock and key for future use. The HRIS manager must take precautions to prevent the test content from being copied and compromised, whether locally or via Internet hacking. Certainly, a related concern is protecting the privacy and security of the candidate scores and other personal information (see Wong & Thite, 2012, for a useful overview on this topic). Another facet is preventing cheating. In addition to having someone else take the test or assist the candidate, the candidate might use resources that are not permitted (e.g., Internet search engines, offline dictionaries, calculators). Cheating is of particular concern when the tests have right answers (e.g., ability tests) or require skills that the candidate can have others perform (e.g., typing tests).

Common sense tells us that the higher the stakes in a testing situation, the higher the likelihood of cheating.

HRIS experts also must be aware of a third issue, equal and fair access. In particular, tests must be fair to legally protected groups, yet unproctored testing and, indeed, Internet recruitment and candidate processing in general run the risk of having a chilling effect on minorities, who, because of the so-called digital divide, might have greater difficulty accessing the Internet to apply for jobs. Minorities also might be disadvantaged by having to rely on small-screen devices such as smartphones to take ability tests if this is their only portal to the Internet. Organizations must provide for multiple ways to gain entry.

These problems do not have easy solutions for organizations that wish to rely on unproctored Internet testing. Tippins et al. (2006) discussed the pros and cons of unproctored Internet testing but did not come to a consensus about the ethics of administering unproctored tests and keeping the process fair. A practice commonly suggested by test providers is to follow up unproctored testing with proctored testing of applicants who “pass” the unproctored test and who satisfy other job qualification requirements (Tippins, 2009). This approach has been officially recommended by the International Testing Commission’s (2006) guidelines on computer- and Internet-based testing. However, there are technical problems with evaluating and acting on score differences, and retesting diminishes the convenience and cost savings that were the original reasons for unproctored testing (Tippins et al., 2006). A review article by Stone, Lukaszewski, Stone-Romero, and Johnson (2013) provides interested readers with further information on the use and acceptance of various types of assessment technologies and systems for selecting candidates into organizations.

Applying HRIS to Selection and Assessment

Selection systems are information management systems for organizational decision making and administration. Therefore, human resource information systems play an important part in their development and use. Where once these systems operated using local software and storage, the availability of cloud computing for remote storage, and licensed, remotely hosted software

as a service (SaaS) now means that HRIS managers will frequently be partnering with or working for consulting firms offering assessment services. One uniquely HRIS-centered role is database design. Selection systems require the careful design of databases to store and keep track of selection data, both before and after individuals are hired, and the ability to link information in interrelated systems, such as candidate test data and demographics, employment data for those who are hired, and job movement and position histories within the company. Increasingly, HRIS experts will be called on to assist in integrating the organization's various HR systems. At a minimum, integration involves linking data in two or more systems, such as the candidate and employee identification data, so that one may conduct database queries and follow individuals as their information passes through the different systems. Integration often also involves linking transactional operations in a system such that, after the first system has conducted a transaction that requires follow-up in the next system, the first system contacts the next system to launch the required transaction. For instance, once a candidate has completed an online application, he or she may be automatically sent to another Web-based application to complete an assessment. The HRIS manager must have a conceptual understanding of what it means to link a test delivery system with other systems, such as applicant-tracking systems. Another general HRIS role in selection systems is the development of scoring and decision rules and of the administrative functions of the system. Whether the output of the completed assessment is simple to interpret (e.g., pass/fail) or complicated (e.g., multiple sources of information, levels of performance, and data from various screening events that could follow), the HRIS expert who participates in the creation of scoring or decision rules must be sure that they are easy for the HR department and others to understand and apply consistently throughout the organization. Another key HRIS role is helping to design and apply the administrative functions of the system, the features permitting access to assessments results, and the right to distribute candidate information. Below are some more specific considerations for designing a computerized or Web-based selection system (Kehoe, Dickter, Russell, & Sacco, 2005):

- *Test access and security:* The HR department must decide how candidates will gain access to the test (By permission? Will there be prescreening? Is testing open to anyone?) and how the test content will

be kept secure.

- *Test inventory and administrative privileges:* The HRIS expert must consider how the computerized tests will be purchased and inventoried (if accessed from a vendor) and the administrative privileges that determine
  - who should be assigned the right to work with particular types of test data,
  - whether there will be multiple levels of access, and
  - whether individuals will be able to delegate record-viewing rights to others.
- *Options for scoring:* Will there be multiple ways to score an assessment, with a variety of possible scoring rules? How might examinees' scores be compared with those of reference groups to make these scores more meaningful?
- *Accessing results:* In what data format and by what methods will test results be stored, transmitted, and interpreted?
- *Applying test policies:* What organizational requirements will affect the testing methods (e.g., systems that allow accommodations for disabilities) and the data that are kept and used (e.g., mandatory waiting periods before retests)?

A new area for HRIS is Big Data—large-volume datasets with a variety of information that may be collected rapidly. For example, information posted on social media not only is high-volume, but also contains text, Internet links, and photos, all of which are updated frequently. Data scientists have begun mining these data to learn about the people who post to social media sites, including their personality and attitudes toward work. Guzzo and colleagues (2015) provide numerous examples as well as cautionary advice regarding the analysis of Big Data. Of particular concern are the ethics of using such data, for example, when the individuals posting online did not give consent for their data to be used in research or to make application decisions, or where it might be possible to connect datasets in such a way that identifies people who posted information privately. Another concern is that such data might be incorrect. It may be difficult to amend one's own inaccurate data online, or as a researcher, to verify the quality of the information gathered there. Big Data is a rapidly growing field that will be of interest to many who pursue a profession in HRIS.

Demonstrating the HRM's Value With HRIS Selection Applications

As mentioned earlier, the HRIS manager plays a key role in proving the value of a selection system, through knowledge of how to obtain and use the right data on individual and organizational outcomes and to demonstrate a return on investment in the system. This expertise is also critical for defending the selection system, which is generally a high-stakes event: the use of the selection information determines individual careers and the company's ultimate success.

Demonstrating the value of selection requires that we know how well the employees who were assessed eventually perform on the job. For instance, if we measure their productivity (e.g., more products assembled or repaired, customers served, or products sold), we may find that people who score higher on the tests also are more productive. As another example, suppose the assessed individuals are supervisors. Among this group, we may find that the higher the supervisors' assessment scores, the better they supervise their subordinates, who have higher skill levels (perhaps as measured with a **knowledge test**) and lower turnover than the subordinates of people whose assessment results were not as high. Testing experts refer to this value or return on investment as utility: the extent to which a selection system results in the selection of better candidates than would have been possible if the system had not been used (Blum & Naylor, 1968). The quality of the candidates may be defined in terms of one or more of the following (Cascio, 1991):

1. The proportion of candidates who are successful on the job
2. The average numeric value of an outcome of interest (such as number of products sold or customers served)
3. The dollar amount of benefit resulting to the organization (such as the annual increase in revenue)

If a selection system produces a higher proportion of successful candidates (e.g., a 10% increase in the number of new financial advisers who, once hired, can pass a government-mandated licensure exam), then that system has clear value to the company. The same can be said of a selection system that

results in an increase in some **performance criterion** (e.g., cable service technicians who are able to complete an average of 20% more installations per day as a result of testing). And the same can be said for a benefit that can be measured in dollars (e.g., for every 10 points higher a salesperson scored on a sales skill assessment, annual sales increased by $1,000).

There are many approaches to estimating utility. Apart from an anecdotal approach (Does it seem like more people are successful on the job now?), perhaps one of the simplest approaches is to conduct pre- and post-comparisons of measurable performance to see if the selection system has coincided with a change in performance. As a more precise alternative, industrial/organizational psychologists frequently use a **utility formula** that takes several factors into account: the **selection ratio**; the **validity coefficient**, expressed as the correlation between assessment scores and criteria (outcomes); and information about the dollar value of performance. The utility formula and related concepts are described here in some detail.

The selection ratio is the number of candidates who, based on the assessment, are chosen for the job, divided by the number of candidates who are assessed. The validity coefficient is a statistical correlation that indicates the correspondence between test scores and job performance or some other important work outcomes. When validity is high, there is a close correspondence between assessment performance and work results. In general, a high-validity, low-selection-ratio system produces the greatest benefit of selection but also incurs the highest cost of selection, all else being the same. When the selection ratio is low, the bar is set high on the assessment and more rarified, higher-performing candidates will be chosen. (This generalization works as long as the selection ratio is not so high or so low that nearly everyone is hired or no one is hired, respectively; in those cases, the assessment has little value as a decision-making tool.) Information about the process used to estimate the dollar value of job performance follows. The value can be obtained from job experts at the organization. Alternatively, published research may be used to estimate this value, and, in many cases, the published value is used for utility estimates.

The result of the utility calculation is the dollar value of the selection system per individual, or group of individuals, hired. (Note that here utility refers to

the dollar benefit of selection, without consideration of the cost. Certainly, it is important to compare this benefit with its corresponding cost to make good business decisions about selection systems.) The formula for utility is $\Delta U = r_{xy} * SD_y * N * \Phi/\rho$, and the elements of the calculation are as follows:

1. ΔU is the utility or annual change in the dollar value of productivity. Items 2 through 5 will be multiplied to calculate this number.
2. r_{xy} is the validity coefficient of the assessment, quantified as a correlation that falls between –1 and +1 and notated as a correlation between *x* (the assessment score) and *y* (the performance criterion score). Positive values indicate that the assessment (also called the predictor) and the criterion (work outcome) increase together; for instance, looking at the range of candidate data, as ability test scores increase, so might evaluations of ability to learn on the job. Negative values indicate that as one increases, the other decreases. For instance, as scores on an assessment of conscientiousness and work ethic increase, the frequency of absence and tardiness might decrease.
3. SD_y is the standard deviation (*SD*) of performance (*y*), that is, the difference, in dollar terms, between an average and a superior performer, which on a normal curve would be estimated as a 1 standard deviation difference. Estimated at 40% of salary based on published research across the spectrum of jobs in the U.S. economy, this value has consistently been shown to approximate the difference in the value of productivity between average and above-average employees (Hunter & Schmidt, 1982).
4. *N* is the number of employees hired.
5. Φ/ρ refers to the test score of applicants who are selected by the organization and is expressed in a statistically standardized form (the standard deviation units in this value and the standard deviation of performance in Item 3 cancel out, leaving a dollar value for the utility estimate).

For example, suppose an employer tests 2,500 clerical job candidates on an assessment with a validity of 0.43 and hires the top 1,000 scorers at an annual salary of $20,000. Therefore, $r_{xy} = 0.43$. The standard deviation of job performance (SD_y or 40% of salary) is estimated to be $8,000. One thousand

employees are hired (N =1,000). The selection ratio is 40% (4 out of 10 qualify); for this ratio, Φ/ρ can be determined from statistical tables of the normal curve; this value is 0.64. Therefore, ΔU = (0.43) * (8,000) * (1,000) * (0.64) = $2,201,600, meaning that the average increase in utility per person hired is $2,202 per year. If all 1,000 employees were to stay three years, we would estimate the utility over that period at approximately $6.6 million. Supposing that the testing program expenses were $300,000 per year, the return on investment for a three-year period would still be about $5.7 million. This example serves to illustrate a method of estimating utility, and it also shows that, when many people are hired, the total value of the assessment quickly yields high numbers. Although organizational stakeholders occasionally are skeptical because of the extremely high utility values that are possible, the principles behind the numbers are sound.

After reading this section, you should reasonably conclude that there are a variety of technical concepts related to selection and assessment with which HRIS experts should familiarize themselves. Our intent has been to provide an overview of these topics and of the trends that are currently taking place in organizations, in the testing industry, and in research programs. By becoming familiar with this work, the HRIS student will gain awareness of the major issues he or she is likely to face when implementing database-based decision-making systems.

Summary

This chapter explained the intersection between the use of technology in the recruitment and selection process and the use of HRIS in organizations. This highlighted the need for HRIS experts to understand how to use the Internet for recruitment as well as selection-related data in order to provide strategic information to the company and demonstrate the return on the company's investment in assessments. In addition, technology issues surrounding the selection process were addressed. Measurement properties of paper-and-pencil assessments and their computer versions were discussed. The mode of assessments that do not include measurements of ability is of little concern for researchers since giving these tests on paper will not result in a different measure from that obtained with a computerized test. However, there is clear evidence that the mode of administration (paper vs. computer) matters for

ability tests that are speeded. The more speeded a test is, the more likely that there will be differences between the paper and computer test results. A second issue focused on in this chapter is the trade-off between fidelity and bandwidth. Technology has enabled organizations to create work sample simulations that represent the job with high fidelity. However, if the company then wants to use the simulation for a different business unit or job, the details that made the simulation highly appropriate in the first setting may interfere with its use in the other setting. In general, HRIS managers should keep in mind that, depending on the effort and expense one is willing to expend on assessment development and installation, lower-fidelity simulations or combinations of other types of assessments might be preferable. One of the final issues dealt with was unproctored testing, which can be convenient to both the applicant and the organization. Unfortunately, this means of delivering assessment gives way to a floodgate of concerns such as how to verify candidate identity, provide test security and eliminate cheating, and ensure fair access to testing for minorities. The chapter further examined the role that HRIS experts have to play in solving these problems through the use of technology and the decision to develop and use an HRIS.

Key Terms

Discussion Questions

1. What recruiting objectives are being met through the use of online recruitment?
2. What are some of the advantages and disadvantages of using online recruitment?
3. Should organizations rely solely on recruiting through the Internet? Why or why not?
4. What are some of the technological issues that arise through the use of technology in the function of selection?
5. Describe how the use of technology in the selection process is adding value to organizations.

Case Study: Recruitment and Selection in a Global

Organization

The case from Chapter 9 will be used here, since recruitment and selection are the next step in the operationalization of a talent management strategy. The background for this chapter case is the case material from Chapter 9; at the end of this background material, more details relevant to the recruitment and selection of new employees will be presented.

Rudiger is sitting at his desk in his seventh-floor corner office in the city, gazing out over London and reflecting on life. At 43, he is at the top of his game. He has everything he could wish for—a lovely partner, a 4-year-old in a private nursery, a new executive house in the suburbs, a holiday home in southern Italy, and a remuneration package that's the envy of his peers and beyond anything his German immigrant parents could have imagined. But it hasn't been easy, oh no! Hard work, long hours, geographical moves every two or three years, and sacrifices in terms of his personal life.

But now he has a problem. Rudiger has just been appointed global head of People and Talent responsible for the future of 35,000 people worldwide, the bulk of whom are based in the United States, the United Kingdom, and Europe, and manufacturing is likely to relocate to China in the next two years, adding to his responsibilities. In his previous role, he was responsible for the United Kingdom and Northern Europe and had operational oversight for 11,000 people. An initial consideration of his responsibilities has identified a number of people issues for the next five years: the company needs to recruit and retain particular specialist and skilled personnel; some of the brightest and most experienced midlevel managers are leaving; an aging senior directorship is looking toward early retirement. But the main difficulty is that, although he knows he has a problem, he doesn't have enough detailed information to know the scale of the problem.

18 months later . . .

Once again Rudiger is sitting at his desk in his seventh-floor office in central London reflecting on life. The move from Barcelona to England went smoothly, with the last crate arriving only two months later than the rest. He is still working hard, but the hours are slightly better since the introduction of

the work-life balance policy last year, and his family has settled well into the idyllic English countryside.

As the global head of People and Talent, he still has problems, though—just different ones. The talent strategy "Our People–Our Talent–Our Future," which he presented to the board in his third month, identified the need for robust HRP information and analyses that required a new version of HRP software. It is in its early stages, but the intensive data-cleansing and updating activity has been straightforward so far. More concerning are the metrics responsible for producing the information needed to develop far-reaching HRP policies and practices for the future. The metrics are relatively easy to construct, but it is proving tricky to find the right "bundles" of predictive metrics—this is holding up progress with the analysis application package. In addition, there have been cost overruns in the implementation of the HRP software, and some senior managers are wondering if the new software should be abandoned.

At least three of the 12 board members will retire in the next two years, and they are looking to groom their successors. At least one will have to be hired from outside the organization, and the HR department is not sure what the CEO wants for this position. In addition, employee turnover and an aggressive growth strategy mean hiring new employees as well as training transferring current employees. The work that is involved in defining competences (KSA sets) at skill levels within jobs is progressing well, with hard-won support from the unions. However, job descriptions that can be found are at least three to five years old, and some jobs have no descriptions. The new apprenticeship scheme is about to be launched, and the international graduate student package and development program has been completely revised. Overall things are progressing reasonably well, but there is much to be done.

Case Supplemental Material

On the basis of your analyses and answers completed for Chapter 9, assume that Rudiger has completed an acceptable HRP program and his staff members have completed current and accurate job descriptions for all positions in the talent management project. These job descriptions all contain

the specific duties, tasks, and responsibilities as well as the KSA sets needed for each job.

Rudiger's next task is to recruit and select individuals for jobs. He wants to use the new HRIS software applications that the company has purchased and implemented for recruiting and selecting new employees. Fortunately, he can get assistance on this task from the IT department, which has built and maintains the company's website. In addition, he has several staff members with doctorates in industrial/organizational psychology who can work with the IT professionals to develop recruitment and selection materials. However, Rudiger must provide the guidelines for the selection and recruitment of individuals who can fit into the talent management project.

Case Study Questions

1. What guidelines would you establish as part of Rudiger's plan that emphasize the use of the Internet via the company's website to communicate the recruiting objectives of the talent management project?
    1. What are the potential advantages and disadvantages of online recruitment to communicate recruiting objectives?
2. What guidelines would you establish for the use of an HRIS for the selection and assessment of potential employees?
    1. What selection and assessment tools could be used on the Internet, and which ones would need to be done on a face-to-face basis?
    2. What are the technological problems that affect selection via the Internet and the solutions that have been suggested?
    3. What guidelines would you develop to make sure that a utility analysis was done for all HRIS selection applications?

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11 Training and Development Issues and HRIS Applications

Ralf Burbach

Steven Charlier

Editors' Note

Training and development (T&D) is central to the success of any organization and an important aspect of an organization's talent management program. Organizations use training not only to improve employee skill and knowledge, but also to develop employees for future positions. In addition, training plays an important role in the motivation of employees. It shows that the organization is concerned about the development of its employees and would like to retain them. However, training generally captures the largest portion of the HR departmental budget. Due to these heavy costs, the application of an HRIS to save money is very important. In this chapter, you will learn more about the effective design of training and development, and how technology is transforming T&D. Specifically, you will learn how training can be made to be cost-effective through an HRIS that serves both as a more efficient transaction processor and as an aid to managerial decision making.

Chapter Objectives

After completing this chapter, you should be able to

- Discuss how training can be used as a source of competitive advantage
- Differentiate between training and development (T&D)
- Understand how training and development affect both learning and motivation
- Explain the steps in a systems model of training
- Understand the essential features of the culture of a learning organization
- Explain the factors that influence transfer of training
- Understand both the costs and the benefits metrics associated with training
- Discuss the critical importance of the evaluation of training
- Understand MIS, HRMS, and DSS (see Chapter 1) training applications
- Explain the advantages and disadvantages of Web-based learning
- Develop a practical application, using EXCEL, in the evaluation of training

HRIS In Action

Midwestern Mighty Markets (Triple M)[1] is one of the largest supermarket chains in five states, with 275 store locations. The corporate director of training, June Grady, was hired externally and has been on the job for two months. She has inherited the job with little information about what happened in the past relative to training and the use of any computer-based technology to manage the training activities and programs. She has begun a careful examination of the training activities, particularly supervisory training since that is where the next higher-level managers will be identified. The annual budget for training has been $2.2 million, of which $1.1 million is devoted to supervisory training.

[1] The company's name must remain confidential.

Supervisory training is one week in length and occurs on a monthly basis in

each state at a central location. It is focused on training assistant department managers (e.g., produce, meat, and grocery) in the supervisory skills needed to be a department manager. Based on department managers' recommendations, assistant managers are sent to training at a central location in their state. However, all assistant managers across the states have the same training content and training activities. At the conclusion of the training, all trainees complete an evaluation of the training program based on their experiences.

The company has an HRIS software application developed by PeopleSoft and implemented three years ago. It is used for the management of all the training in the company. There are a number of reports that can be generated from the software, including attendance by states, stores, and departments within the stores. This information is useful for June, so she can make sure that training is occurring evenly across departments, stores, and states. Other reports are also available that can be sent to department and store managers as well as to the regional managers of Triple M.

June has been examining all these reports available from the HRIS software to determine if anything is missing. During her examination, she notices that no one has been accessing the reports summarizing the trainees' evaluations of the training programs. On further examination, she finds that some store managers receive these summary reports but rarely use them. Also, she discovers that there is an additional report that has been designed to be generated by the software. This report is based on evaluation data that are to be collected from department managers three months after the trainees have returned to their jobs. This report appears quite important since it asks the department managers to rate the trainees' job performance after they have completed training to determine any effects of the training.

June sees a serious problem with this lack of training-evaluation data collection and assessment; the trainees' post-training evaluations are not being analyzed by the available software, and, more important, the department managers' ratings of trainee job performance are not being completed. Therefore, even though the company owns sophisticated (and costly) software, it is not being used to evaluate the supervisory training programs. More seriously, June has no idea if the $1.1 million being spent on

supervisory training has had any effect on the job performance of the trainees.

Introduction

> *The only thing worse than training your employees and having them leave is not training them and having them stay.*
>
> —Henry Ford

The nature of work and the structure of organizations are rapidly changing. Internationalization, globalization, technological advances, and changing customer expectations of service and quality standards require firms to improve and transform themselves perpetually to remain competitive. Emerging concepts such as the global marketplace, knowledge economy, knowledge worker, information age, and digital revolution underscore that an organization's ability to survive in a constantly changing business environment is founded on its capacity to generate new knowledge, to share knowledge, and to innovate continuously (Alavi & Leidner, 2001; Gold & Malhotra, 2001; Nonaka & Takeuchi, 1995; Porter, 1990; Senge, 1990). In the new global economy, knowledge is now the new lever for success, since knowledge potentially adds more value than the traditional factors of production—capital, raw material, and labor (Harrison, 2005). This new knowledge-based economy is

> directly based on production, distribution and use of knowledge and information. Knowledge is now recognised as the driver of productivity and economic growth, leading to a new focus on the role of information, technology, and learning in economic performance. . . . Employment in the knowledge-based economy is characterized by increasing demand for more highly skilled workers. . . . The knowledge-based economy is characterized by the need for continuous learning of both codified information and the competencies to use this information. (Organisation for Economic Co-operation and Development [OECD], 1996, pp. 3, 7,

13)

Knowledge is created by a firm's knowledge assets, that is, its **human capital** [2] (see OECD, 2001, p. 18), which has long been recognized as one of the key sources of competitive advantage (Barney & Wright, 1998; Grant, 1996; Hatch & Dyer, 2004; Prahalad & Hamel, 1990; Wright, Dunford, & Snell, 2001). Hence, the **learning, training, and development (LT&D)** of employees is now center stage in today's organizations to ensure long-term competitiveness, excellence, quality, flexibility, and adaptability. Changing work practices and new services and products necessitate new knowledge, competences, and skills. It may also be argued that today's organizations ought to learn faster and more effectively than their rivals in order to remain competitive. However, a range of other reasons exists as to why organizations train and develop their workforces—for instance, to enable employees to cope with daily workloads. T&D activities can also alleviate possible future skill shortages and play a fundamental role in talent management. High-commitment organizations train and develop their employees to foster employee motivation and satisfaction (Pfeffer, 1996, 1998). In a time when job security is diminishing and employability is of increasing value, employees place much greater emphasis on career prospects and career development in their choice of employer. This point is of particular relevance for specialist knowledge workers who are in short supply in a tight labor market. The strategic importance of individual and organizational learning and development is mirrored in the continued interest in the concepts of the **learning organization** and **organizational learning**. These terms are often used interchangeably. However, the learning organization is the ultimate state of organizational learning at which the organization is able to facilitate the learning of all its members and can continuously transform itself (Argyris & Schon, 1978; Pedler, Burgoyne, & Boydell, 1991). "It is the potential of organizational learning to enable organizations to reinvent themselves in order to compete in the changing and increasingly uncertain and competitive environment that is making it such an attractive proposition for many managers" (Burnes, 2004, p. 129).

[2] The bold terms in this chapter are included in the list of key terms. These terms cannot and do not purport to provide an exhaustive list of HRIS T&D

applications. However, they furnish explanations of the key concepts discussed in this chapter. More extensive e-learning glossaries are available on the Internet, for instance, from the Association for Talent Development (https://www.td.org/Publications/Newsletters/Learning-Circuits/Glossary).

Yet it has been argued that few firms, if any, have actually achieved this aim. Nonetheless, the notion of the learning organization illustrates that organizational learning is inextricably linked to individual LT&D. It is also closely linked to the notion of lifelong learning and continuous professional development. Employees at all levels of the organization will have to demonstrate their commitment to these, especially when they seek a new employer, pay increases, or promotions. T&D activities are thus closely allied with **performance management** and talent management. Most large organizations use human resource information systems (HRIS) to collect, store, and analyze T&D information. This information is generally contained in specialist talent management modules, T&D modules, and learning management systems to reflect the strategic importance of LT&D in the organization. This chapter examines the strategic implications of T&D before it covers the systems model of training and development. The section on the systems model will look in detail at its four stages—identifying T&D needs, designing T&D solutions, implementing T&D, and evaluating T&D. Then, training metrics and benefit analysis will be discussed. The next section investigates some HRIS applications in training and some implementation issues. The chapter concludes with a summary of the key issues.

Training and Development: Strategic Implications and Learning Organizations

The introduction to this chapter has already alluded to a number of key terms associated with T&D. Some of the terms, such as *learning*, *training*, *development*, and *education*, are frequently used in combination and sometimes even, incorrectly, as substitutes. To comprehend the processes involved in LT&D, we must differentiate these key concepts. *Education* is aimed at developing, usually as part of a formal program of study, general knowledge, understanding, and moral values. *Training* refers to the planned acquisition of the knowledge, skills, and abilities (KSA) to carry out a

specific task or job in a vocational setting. The purpose of training interventions is to attain a positive change in performance. *Development* is a continuous process of systematic advancement, of "becoming increasingly more complex, more elaborate and differentiated, by virtue of learning and maturation" (Collin, 2007, p. 266). Development in an organizational context ensures that employees possess the KSA required to fulfill future roles in the organization. Hence, development may be conceived as a lever for career development, succession planning, performance management, and talent management (Gunnigle, Heraty, & Morley, 2002). Training focuses on immediate job performance, whereas development centers on long-term, continuous changes of an individual's potential. Learning is defined as the process of assimilating new knowledge and skills in consequence of experience or practice that will bring about relatively permanent changes in behavior. Effective learning necessitates a capacity to integrate new knowledge with existing knowledge (Learning, 2007). However, the manner in which adults learn and are motivated to learn differs fundamentally from the ways in which children and adolescents learn. Andragogy, or the study of adult learning, purports that adults learn best under the following conditions:

1. They know the reasons for learning a new concept or skill.
2. They are actively involved in creating or setting the learning activity.
3. They can connect new learning to the knowledge and experience they have developed over time.
4. Learning is problem centered.
5. They believe a learning activity is immediately relevant to their job.
6. They are internally rather than externally motivated to learn; in other words, they learn when they can see a benefit. (Knowles, Holton, & Swanson, 2005)

Learning at an individual or organizational level is ineluctably linked to the creation and management of knowledge. Learning is the basis for any T&D activity. The outcomes of learning include skills, competencies, know-how or tacit knowledge, and higher-level cognitive and other skills (Collin, 2007). Skills are directly related to performance and the ability to carry out a task. It has been argued that new organizational realities require higher levels of cognitive skills. Bloom's taxonomy of learning, for example, identifies six increasingly higher levels of thinking—knowledge, comprehension,

application, analysis, synthesis, and evaluation (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). Competencies consist of KSA and the underlying characteristics of a person that allow the jobholder to perform a task effectively. The knowledge of employees is a tacit commodity, an intangible asset. It is associated with an understanding of and a constructive application of information (Grant, 1996). In a knowledge-based economy, organizations must become knowledge productive, and employees, knowledge workers and knowledge assets. Knowledge-intensive organizations are those that heavily depend on knowledge creation and knowledge sharing, such as firms with a significant research and development focus or consultancy firms. **Knowledge management (KM)** essentially consists of five separate activities, which are the acquisition, documentation, transfer, creation, and application of knowledge (Yahya & Goh, 2002). Whereas knowledge is generated by individuals, organizational knowledge and learning are the result of the combined learning of everybody in the organization and the acquisition of knowledgeable individuals (Grant, 1996).

Hence, if a firm's organizational culture rewards learning, it facilitates KM and the transformation of the firm into a knowledge organization (Mayo, 1998; Soliman & Spooner, 2000). The sharing, codifying, storing, and replicating of knowledge within the organization is greatly facilitated by information and communication technology (ICT). Consequently, KM focuses on the interaction of human beings and ICT and the subsequent creation of knowledge and, in addition, on the alignment of technology with people systems within a firm. The HR department plays a vital role in determining where, among employees, tacit knowledge exists, what type of knowledge is present, and whether and to what degree this knowledge is conducive to attaining present and future organizational goals (Soliman & Spooner, 2000). Should the HR function detect a gap between existing knowledge and the knowledge necessary to pursue strategic objectives, it can initiate procedures to remedy this shortfall through recruitment, socialization, and T&D initiatives. It is evident that the concepts of KM and organizational learning are closely related. Organizational learning is by no means a new concept. Argyris and Schon (1978) suggested a three-level model of organizational learning, consisting of single-loop, double-loop, and triple-loop learning. Single-loop learning is adaptive and focuses on the detection of deviations in performance from established organizational norms,

practices, policies, and procedures. Double-loop learning questions the suitability of norms, practices, policies, and procedures that define performance standards. Triple-loop learning challenges the rationale of the organization with the aim of completely transforming it (Burnes, 2004). One of the most influential proponents of the learning organization is Peter Senge. In his book *The Fifth Discipline*, he puts forward five interrelated disciplines that an organization should cultivate among its employees to engender learning and success (Senge, 1990):

1. *Personal mastery:* individual growth and learning
2. *Mental models:* deep-rooted assumptions that affect the way in which employees perceive people, situations, and organizations
3. *Shared visions:* a shared view of the organization's future
4. *Team learning:* a shift from individual learning to collective learning
5. *Systems thinking:* or the "Fifth Discipline," which connects the previous disciplines (Burnes, 2004)

Other writers promote generic organizational characteristics that stimulate organizational learning. Cummings and Worley (2009), for instance, advocate a flat teamwork-based organizational structure to facilitate networking; the use of information systems to collect, process, and share information; human resource practices such as appraisals and rewards that reinforce learning; effective leadership that is supportive of organizational learning; and an organizational culture that encourages openness, creativity, and experimentation among members of the firm. A learning culture is one of the key levers for organizational learning, training, and development. Transfer of training is far more likely to occur in an environment where the basic assumptions, shared values, norms, and artifacts of an organization espouse successful LT&D, and where employees are encouraged to create, process, and share information and knowledge (Cummings & Worley, 2009). A T&D intervention can only be considered successful if transfer of training has occurred and a permanent change in behavior has taken place.

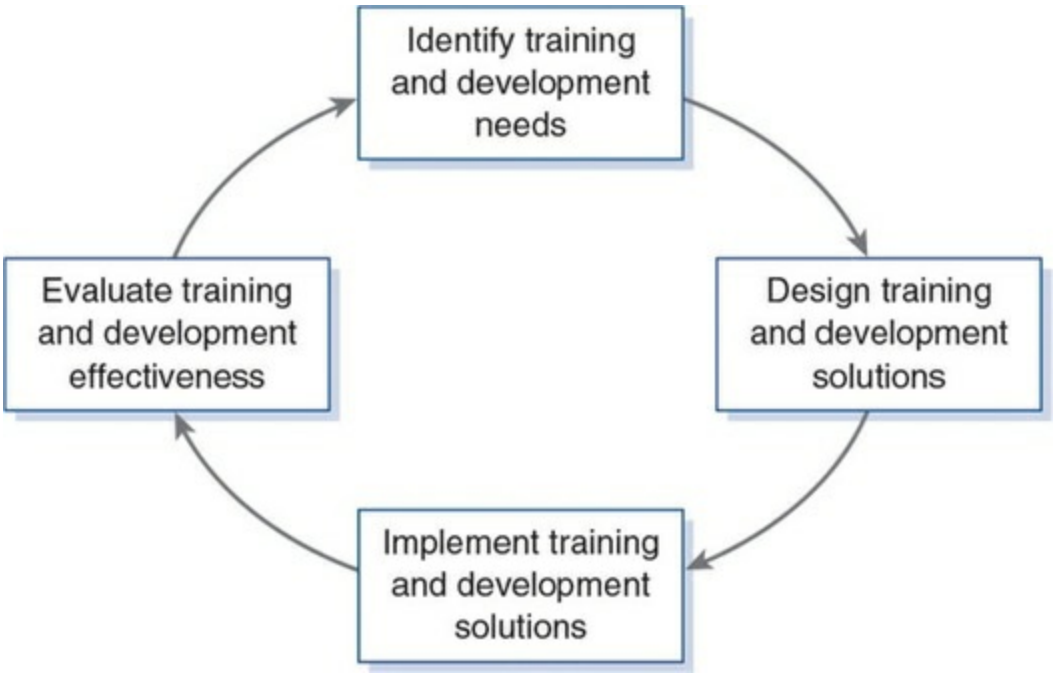
HRIS training and development applications play a fundamental role in fostering organizational learning. These applications provide organizations with a mechanism to assess, measure, facilitate, manage, and record systematically the LT&D of each employee and thus the entire organization.

In that way, HRIS LT&D applications also support HRIS Talent Management and Performance Management applications. For instance, LT&D applications may be utilized to manage the training and development of high potential employees. In addition, employees' training records could feed into their performance evaluations.

Systems Model of Training and Development

The approaches to T&D adopted by organizations are quite possibly as diverse as the organizations that employ them. The literature is teeming with different, sometimes competing, models, which mirror the approaches to T&D found in practice. One of the most frequently cited models is the systems or systematic approach. This formal or planned approach to workforce T&D consists of four interrelated and connected steps, which are illustrated in Figure 11.1. The steps are arranged as a cycle to highlight the cyclical and continuous nature of the process; the systems model, then, is conceptualized as an ongoing activity, in much the same way as is employee development. Thus, the model is applicable to both training and development. Its simplicity and clear structure make it ideally suited in the context of HRIS applications in this area. In addition, the model provides a rational foundation for the allocation of resources throughout the T&D process. However, the systematic model has also received some criticism *because* of its simplicity, because of the fact that it is a closed system, and because it does not take account of individual differences among the learners. Notwithstanding these criticisms, the model continues to find broad application, for instance, in the development of national training standards and, indeed, in many IT-based T&D applications that are designed based on the four steps (Stewart, 1999).

Figure 11.1 The Systems Model of Training and Development



Identifying T&D Needs

The first step of the systems model is concerned with the identification of the learning and development needs of organizational members. The **training needs analysis (TNA)** is the key activity of the systematic approach and essentially serves to identify any discrepancies, the T&D "gap," between existing KSA and those required in the present and in the future. Thus, it ensures the integration of employee T&D activities with the business needs of the firm. Hence, the TNA must assess the validity of initiatives, it ought to assist in prioritizing T&D objectives and initiatives, and it has to be able to determine the actual training needs. Training needs may arise at three distinct levels (Boydell, 1983):

- At an organizational level (current and future employee T&D requirements that an organization has to fulfill in order to attain its strategic long-term objectives)
- At a job level (relevant KSA that are part of specific jobs)
- At a personal level (the competences required)

Because of the crucial importance and comprehensive nature of the TNA, many organizations employ an HRIS to collect, store, and analyze training

needs data, thus ensuring that the resulting information is both timely and accurate. Data sources range from business objectives and statistics, at the organizational level; to job descriptions and output levels, at the job level; and staff appraisals, biographical data, and individual training records, at the personal level. Most HRIS can be configured to gather data from these and other sources. However, a host of specialist T&D software (discussed further on in this chapter) exists that will aid a firm in accomplishing its T&D activities. In the event, however, that the TNA highlights a considerable gap between existing and desired KSA, an organization may decide on external recruitment to hire individuals who already possess the required competencies. In that case, it will be of vital importance that the organization has access to skilled personnel and demographic data, which might provide some indication regarding the skill levels of the wider population and the environment in which the firm operates.

Developing T&D Initiatives

The second stage of the cycle focuses on the development of T&D initiatives, objectives, and methods that should be capable of meeting the three levels of needs identified during the first phase, the TNA. Organizations have a wide array of T&D methods at their disposal, and advances in and access to ICT and mobile technologies will further increase the number of methods and ways of content delivery available. Faced with an apparent overabundance of methods, how should organizations choose the ones most appropriate for their needs? A number of criteria will guide the decision-making process.

The effectiveness of individual learning plans and events ultimately hinges on the design of these T&D interventions. A learning activity can be considered successful if it leads to transfer of learning as well as a noticeable and permanent change in behavior in the trainees. The aim of the HRIS in this context is to compare employee training data with subsequent performance data. Successful learning events must achieve a “best fit” between

- the content of what is to be learned,
- the media through which content is delivered, and
- the method used to facilitate learning (see Figure 11.2).

With regard to individual learning, it is important to note that every individual has his or her preferred learning style and that these learning styles must be taken into consideration when one designs a training event to encourage learning transfer (explained below). Based on Kolb's (1984) learning cycle, which involves a concrete experience, reflective observation, abstract conceptualization, and active experimentation, Honey and Mumford (1992) developed four preferred learning styles—activist, reflector, theorist, and pragmatist. Additionally, the VARK framework (Fleming, 2001; Fleming & Mills, 1992) has been proposed as an alternative view of learning styles, suggesting four different preferences for learning activities—visual, aural, read/write, and kinesthetic.

In today's highly regulated working environments, it is also essential to attain internal and external consistency. Internal consistency is achieved if learning interventions are mutually supportive of one another and of the business objectives. External consistency is attained if T&D activities are aligned with external regulations (e.g., health and safety legislation), best practices in the industry, and the stipulations and standards of external training award bodies. The conditions for a successful learning event are illustrated in the **best-fit learning event model** in Figure 11.2.

T&D methods essentially fall into two broad categories—on the job and off the job, albeit the emergence of e-learning has somewhat diluted this distinction, as it can be either (Welsh, Wamberg, Brown, & Simmering, 2003). **On-the-job training** usually involves peer observation and can be informal, structured, or unstructured, although successful learning outcomes are more likely to occur in a structured rather than an unstructured environment. Compared with **off-the-job training**, on-the-job training is relatively inexpensive. While off-the-job methods may provide greater exposure to expert knowledge, they may also be more time-consuming and may not encourage knowledge transfer. Table 11.1 lists a number of examples of T&D methods in each category.

Figure 11.2 Best-Fit Learning Event Model

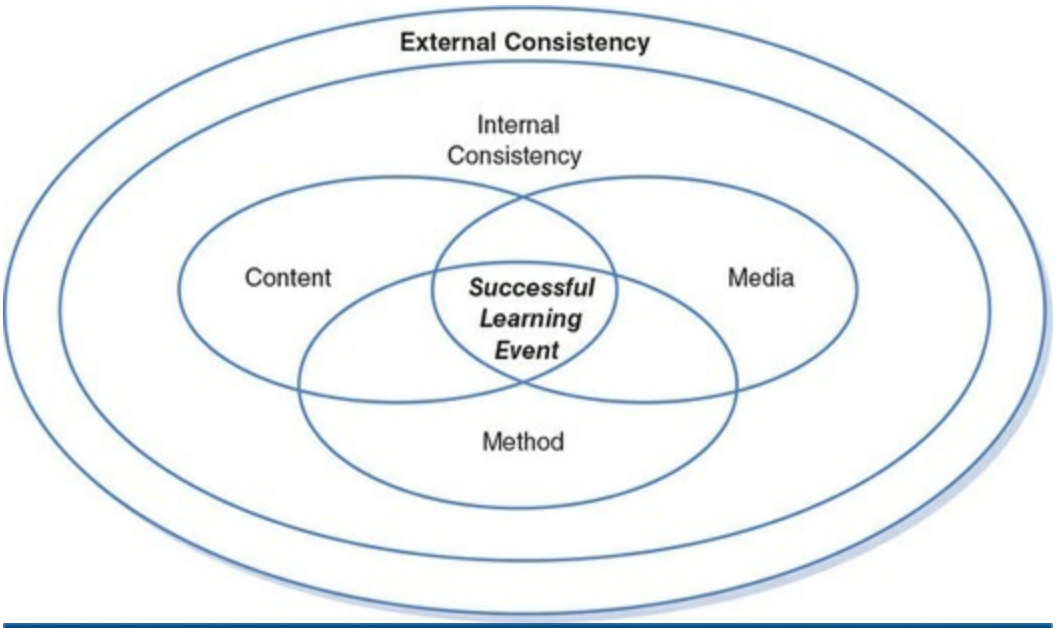


TABLE 11.1 ■ Training Methods

On-the-Job	Off-the-Job
Observation	Simulation
Mentoring	Role play
Coaching	Case study
Job rotation	Business games
Apprenticeship	External course or workshop
Self-directed learning	Behavior modeling
	Placement
	Open, distance, or blended learning

e-Learning

e-Learning (also *elearning*, *Elearning*, or *eLearning*) is an umbrella term and broadly refers to any learning facilitated using electronic means. Recent reports by the Chartered Institute of Personnel and Development (CIPD, 2015), Insala (2014), and the Association for Talent Development (2015) indicate that as the number of people accessing the Internet using a mobile device surpasses the number of people doing so using ordinary desktop computers, mobile learning, virtual classrooms, and social media are rapidly replacing traditional forms of learning and early forms of e-learning, such as

computer-based training. Yet confidence levels in the ability of organizations to effectively harness technology for T&D needs are lagging (CIPD, 2015), and overall effectiveness of e-learning is a concern for many organizations (CIPD, 2015; Insala, 2014). Nevertheless, **e-learning** has the potential to capitalize on a variety of different technologies that have emerged as a result of rapid developments in information technology and the World Wide Web. The technologies can be commonly categorized as **Web 1.0, Web 2.0,** and **Web 3.0**. These are explained in Table 11.2.

Other technologies used in e-learning encompass computer-aided assessments, animations, simulations, games, and electronic performance support systems (EPSSs). EPSSs are not learning technologies per se. However, they provide an electronic support infrastructure that allows employees to carry out their work. An EPSS would typically include assistants (e.g., Microsoft Office Assistant), wizards, knowledge bases, help, and advice functions. A number of Web 1.0 e-learning methods to address different training needs are identified in Table 11.3.

The e-learning methods explained in Table 11.3 are arranged according to the extent to which they use the Internet, the degree to which they facilitate interaction between peer learners and instructors, and the degree to which computers are networked or not networked. They are arranged in increasingly complex order; **mobile learning** shows the highest level of interaction and networking. However, this does not imply that methods that rely on greater student interaction or that allow greater access to external resources are necessarily the best options for all situations—the choice of e-learning method will depend on the best fit with the training needs that ought to be addressed (see Figure 11.2).

However, rapid developments in ICT also imply that many methods and approaches have a relatively short shelf life; that is, they quickly become obsolete (e.g., computer-based training). In addition, the distinction between some of these e-learning methods has become blurred, and the terminology can be confusing as terms are often used interchangeably. Increasingly the media employed in e-learning is interactive; that is, the learner interacts with the media. Using Web 2.0 and Web 3.0 technologies the e-learning content is generated by the users themselves and learning occurs “socially”; that is, the

learner interacts with other learners and media to create their own learning environment.

Thus, online learning relies on digital collaboration. The term *digital collaboration* denotes networking and communication via the Internet using a variety of mobile devices. Although digital collaboration is of vital importance in the effectiveness of virtual teams in the business world, online collaboration between learners also tends to increase learning and learning transfer. Intranet-based **collaborative technologies**, such as groupware (electronic meeting software), provide a company forum for tracking, sharing, and organizing information. Groupware combines e-mail, document management, and electronic bulletin boards and allows users to collaborate on projects and documents simultaneously. The most common groupware is Lotus Notes (Noe, 2002). However, Google Mail combined with Google Docs and Outlook combined with Office 365 represent free alternatives. Internet-based collaborative Web 2.0 technology, or social networking technology (e.g., blogs, wikis, or podcasts), play an increasingly important role in informal peer-to-peer learning, which is much faster, more flexible, and more responsive than formal modes of training (Frauenheim, 2007). Collaboration and communication in this context may be synchronous or asynchronous. **Synchronous communication** refers to "real-time" or live communication using tools such as messenger services or videoconferencing. Smartphones have become the device of choice for this type of communication and various apps are available for the various mobile platforms such as iOS and Android. Web 2.0 and Web 3.0 technologies thus create virtual classrooms that can be accessed anytime, anyplace, and which have the potential to be far more interactive than traditional classrooms could be.

However, not all collaboration can occur in real time, especially if learners are geographically dispersed across different time zones. While **asynchronous communication** still makes use of the Internet, communication is delayed, and learners access the learning spaces at their own convenience. Table 11.4 provides some examples of synchronous and asynchronous methods of e-learning.

Although it is important to make a distinction between different forms of

collaboration, most e-learning combines various types of communication, collaboration, e-learning methods, and, in some cases, more traditional approaches to maximize learning transfer. Testing and assessment of e-learning may rely on traditional paper-based methods, the electronic submission of files, or interactive assignments (including online discussions). The combination of e-learning methods with traditional face-to-face methods is referred to as **blended learning**. According to industry reports, the use of blended learning in workplace training is rapidly increasing (Rossett & Frazee, 2006; Shaw & Igneri, 2006; Sparrow, 2004). This hybrid approach promises to combine the advantages of both traditional and e-learning approaches to training. For instance, one of the key issues in workplace training is the ability to apply new skills to the actual job. However, most online training does not provide for the application of new knowledge and skills, which is one of the key elements of Kolb's learning cycle. Blended learning, thus, allows the learner to apply new skills in a real-life situation, either in a classroom or on the job. Nevertheless, recent research suggests that student individual differences may play a key role as to whether or not a blended learning system will be effective. Individuals with higher self-efficacy and a more internal locus of control may be better equipped to persist in the face of challenges presented by a blended learning environment (Beaudoin, 2013; Sitzmann & Ely, 2011).

The development of e-learning programs and resources requires significant investments of time and money. However, the volatile nature of the global marketplace and the rapidly changing information needs of firms necessitate a different approach to e-learning. While standard e-learning solutions can take months to develop, **rapid e-learning (REL)** or just-in-time learning solutions may be developed in weeks, days, or even hours, depending on the complexity of materials to be created. Essentially, REL allows companies to produce a large amount of content, using limited resources, in a short time interval, and deliver this content in real time to a large number of people. Therefore, it is not surprising that industry observers predicted significant increases in the REL market a decade ago (Archibald, 2005; van Dam, 2005). Indeed, a recent report finds that almost 50% of U.S. organizations utilize an REL tool in their T&D activities (Training, 2014). REL has a number of key characteristics:

- It has a short development time.
- Subject matter experts (SMEs) act as the key source of content development.
- It can be created using standard presentation software.
- It allows for easy assessment and tracking of training.
- Auxiliary multimedia tools (including flash applications) can be used to enhance training experiences.
- Training units can be undertaken in minutes rather than hours.
- It can be synchronous as well as asynchronous. (Bersin, 2005)

REL should ideally be used to deal with

- urgent necessary business and training needs,
- short shelf life of training,
- critical information needs and standard information broadcasts,
- training that is purely informational in nature,
- training that does not require mastery,
- prerequisite and introductory training, and
- training updates.

However, it finds limited application for training in new skills and competencies (Bersin, 2005).

Although e-learning methods diverge on a number of levels, for instance, the level of interaction between learners, e-learning, in general, offers a range of advantages and disadvantages to the learner and to the organization. These are shown in Table 11.5. The key advantage of e-learning is flexibility; that is, it affords learners the choice of what, when, where, and how much is learned. The key disadvantages center on the lack of human contact and technological issues.

Despite the increasing global popularity of e-learning initiatives, they suffer from several shortcomings. Nunes, McPherson, Annasingh, Bashir, and Patterson (2009) identify several of these:

- Some of the most advertized advantages of e-learning, such as reductions in the travel and accommodation costs associated with face-to-face training, are not well accepted by learners. Often, trainees have

to undergo e-learning in addition to their normal workloads, in the office, and subject to their usual daily work pressures.

- Another source of dissatisfaction with e-learning is its lack of human touch: the lack of interaction with knowledgeable trainers and the lack of socialization with fellow learners.
- Generic multimedia simulations without an organizational and work-specific focus tend to alienate learners.
- Organizations still tend to rely on the conservative "drill-and-practice" model and "force-fed instruction" and, in the process, ignore the social, informal, and collaborative aspects of learning.
- There is also less emphasis on learner-centered approaches that take advantage of social negotiation, on-the-job learning, on-demand learning, and peer support. New learning models are moving in the direction of "casual, instant, and informal" learning facilitated by Web 2.0 technologies, such as blogs, Webcasts, online conferencing, and mobile learning using mobile devices.
- There is little research that links e-learning to employee creativity, innovation, and adaptability—all of which are essential to any workforce in the 21st century knowledge economy.
- Often, learners are pushed into e-learning without being properly equipped with the basic skills required for being successful in a networked learning environment. e-learning may also ignore diversity considerations, as certain groups of employees, such as ethnic minorities, women, and older people, may not have the aptitude and confidence to learn in a computer-mediated environment.
- Finally, e-learning is currently serving the needs of mainly large organizations and has yet to address the learning needs of small and medium-sized enterprises.

Salas, DeRouin, and Littrell (2005) offer several research-based guidelines for designing e-learning packages. Even though these guidelines pertain to **distance learning**, they are relevant and useful for other e-learning methods as well:

- Only provide e-learning when you are sure it meets the organization's specific learning and development needs.
- Train learners on computer basics before offering computer-based

training.

- Take into consideration human cognitive processes when designing e-learning programs.
- Enhance the learning experience by including graphics, texts, and learning games in the presentation of learning topics.
- Keep learners engaged by offering blended learning and allowing interaction among trainees and between trainees and facilitators.
- Offer trainees control over certain aspects of instruction, and guide them through the learning process by using tools, such as cognitive maps.

TABLE 11.2 ■ Web Technologies

Technology	Explanation
Web 1.0	The first-generation web, including CD-ROMs, interactive videos, DVDs, video streaming, web pages, and software programs
Web 2.0	Web-based file sharing and user-generated interaction using discussion forums, e-mails, blogs, wikis, and/or social media websites such as Yammer, MySpace, YouTube, Twitter, Facebook, Renren, LinkedIn
Web 3.0	The "intelligent Web" based on a number of developments such as the semantic Web, open access, augmented reality, and intelligent applications (e.g., speech recognition). Web 3.0 focuses on the use of software as a service, cloud computing, multiple technologies, and mobile devices. This is often associated with mobile learning.

TABLE 11.3 ■ Web 1.0-Based e-Learning Methods

e-Learning Methods	Explanation
Computer-based training (CBT) or technology-based training, computer-managed instruction (CMI), computer-aided (assisted) instruction (CAI), computer-based learning (CBL)	Interactive training experience using a stand-alone computer, when no collaboration and access to external resources is necessary; media used include CD-ROMs, DVDs, interactive video
Multimedia-based training (MBT)	Training experience that combines text, colors, graphics, audio, and video to engage the learner; MBT can range from a simple graphical presentation of text to a complex flight simulation
Distance learning (or education)	Learner and tutor are in different locations; the approach uses both synchronous and asynchronous communication; the course provider usually provides online support and supplies students with a course pack, including printed and audiovisual materials; courses follow a predetermined curriculum and schedule
Open learning (or education)	Learner has complete control over how, what, when, where, and at what pace learning occurs; any type and combination of media may be used
Open distance learning (ODL)	Umbrella term that covers both open and distance learning
Virtual learning environment (VLE) or virtual classroom	Online environment in which learning takes place
Web-based training (WBT) or online learning (or education), **Internet-based training (IBT)**	Any training and learning that takes place online, that is, via the World Wide Web
Mobile learning	Any T&D offering that involves mobile technologies; mobile technologies include notebooks, pads, smartphones, MP3 players

TABLE 11.4 ■ e-Learning Communication Typology

Synchronous	• Virtual learning environments (VLEs) • Instant messaging/texting services • Audio- and videoconferencing • Digital chat rooms • Shared whiteboard applications • Application sharing
Asynchronous	• E-mail • Discussion forums or blogs • Threaded discussions • Self-paced learning

TABLE 11.5 ■ Advantages and Disadvantages of e-Learning

Advantages	Disadvantages
Cost advantages compared with traditional methods	Basic computer skills necessary
Improves computer skills	Use of computers might cause apprehension
Self-paced	Not suitable for certain content
High degree of learner control	Privacy concerns if based online
Choice of learning environment	Requires self-motivation to learn
Interactive	Learners may feel isolated from instructors and peers
Easy tracking of learner progress and engagement	Lack of human contact in general
Real-time feedback	Technical difficulties impede access
Consistent delivery method	
Variety of formats and methods available	
Consistent content	
Unlimited access in terms of time and locale	
Better support, help functions, knowledge base than other methods	
Appeals to several senses simultaneously	
Increased benefits through the combination with traditional training methods	
Can be both synchronous and asynchronous	
Accommodates different learning styles	

Implementing T&D

The third stage of the systems model of T&D involves the implementation of training. Although this stage is depicted as a separate phase of the training

process, it is closely linked with the preceding stage, the design stage. Indeed, many book chapters on T&D consider both stages in unison. The reason for this is that the design of a training solution ultimately determines its implementation, as any issues and factors that could arise during the implementation phase should be anticipated at the design stage (Stewart, 1999). For instance, if an organization wanted to roll out e-learning to its entire workforce via the company intranet, the firm would have to ensure that every employee had access to the intranet. To ensure that the implementation phase runs smoothly, organizations ought to formulate an implementation plan that should specify

- the resources required,
- how the training should be carried out,
- who should facilitate the training, and
- the period within which the training should occur.

The requisite resources vary with the training method chosen. While traditional face-to-face training necessitates physical training rooms and equipment, e-learning requires initial investments in ICT. Available resources are normally set out in predetermined annual training budgets. The training design will provide answers to the questions of how, by whom, and when training should be implemented. The implementation of a T&D initiative can only be considered successful if transfer of learning has occurred.

Training Transfer

Positive and long-lasting changes in employee behavior and, ultimately, increased shareholder value can only be attained if training (or learning) transfer occurs. **Training transfer** is the continuous application of the KSA acquired during the training exercise. Various classifications of transfer of training exist depending on the context:

- Near versus far (how close the training task is to the actual job task)
- Specific versus general (transfer of skills versus transfer of principles)
- Positive versus negative (linked to the perception of the training experience)
- Lateral versus vertical (Hayashi, Chen, & Terase, 2005)

Lateral transfer is about the application of training to similar tasks at the same level of complexity, while vertical transfer implies analysis and synthesis, that is, the ability to apply training to more complex tasks (Gagné, 1985). Training transfer depends on a number of variables, which can be summarized under five headings (Baldwin & Ford, 1988):

1. Trainee characteristics (the trainee's predisposition to training)
2. Training design (the organization of the learning environment)
3. Work environment (the immediate factors at work that affect transfer)
4. Learning and retention
5. Generalization and maintenance (ensuring that the trainee is given the opportunity to continuously use the acquired KSA)

Only if the trainee possesses the necessary characteristics (e.g., high cognitive ability, high conscientiousness, and voluntary participation), the training design and workplace environment foster learning transfer (e.g., supervisor support), and the trainee is given ample opportunity to apply the training will learning and retention take place (Blume, Ford, Baldwin, & Huang; 2010). In addition, it has been demonstrated that transfer of training is *critically* dependent on the organizational climate that supports the training transfer (Lance, Kavanagh, & Brink, 2002; Rouiller & Goldstein, 1993; Tracey, Tannenbaum, & Kavanagh, 1995; Velada, Caetano, Michel, Lyons, & Kavanagh, 2007).

Evaluating T&D

To assess whether a particular training initiative, method, or solution has met the training needs and objectives of the firm and whether transfer of learning has taken place, organizations must evaluate their T&D efforts. Training evaluation is not an isolated activity. It is part of the T&D cycle and must be considered alongside and aligned with needs analysis, design, and implementation to provide a holistic picture of the entire T&D process. Similar to the T&D cycle, the evaluation process should be viewed as cyclical. The steps in the evaluation process are illustrated in Figure 11.3.

The evaluation process commences with the needs analysis. Training needs must then be translated into measurable learning outcomes. Appropriate

metrics must be identified against which outcomes can be measured. The next step involves the selection of an appropriate evaluation strategy. Not all training can be assessed in the same manner because of the diversity in training methods. Once an evaluation has been carried out, the results must be analyzed and fed back into the training process. This final step is omitted in many evaluation models, even though it is crucially important to use evaluation data to make decisions about future training initiatives. An HRIS can be invaluable in supporting this process as it contains a vast amount of data related to training and performance that can form the basis of any T&D decision.

However, many organizations pay lip service to evaluation without having a clear concept of what evaluation means and what purpose it serves.

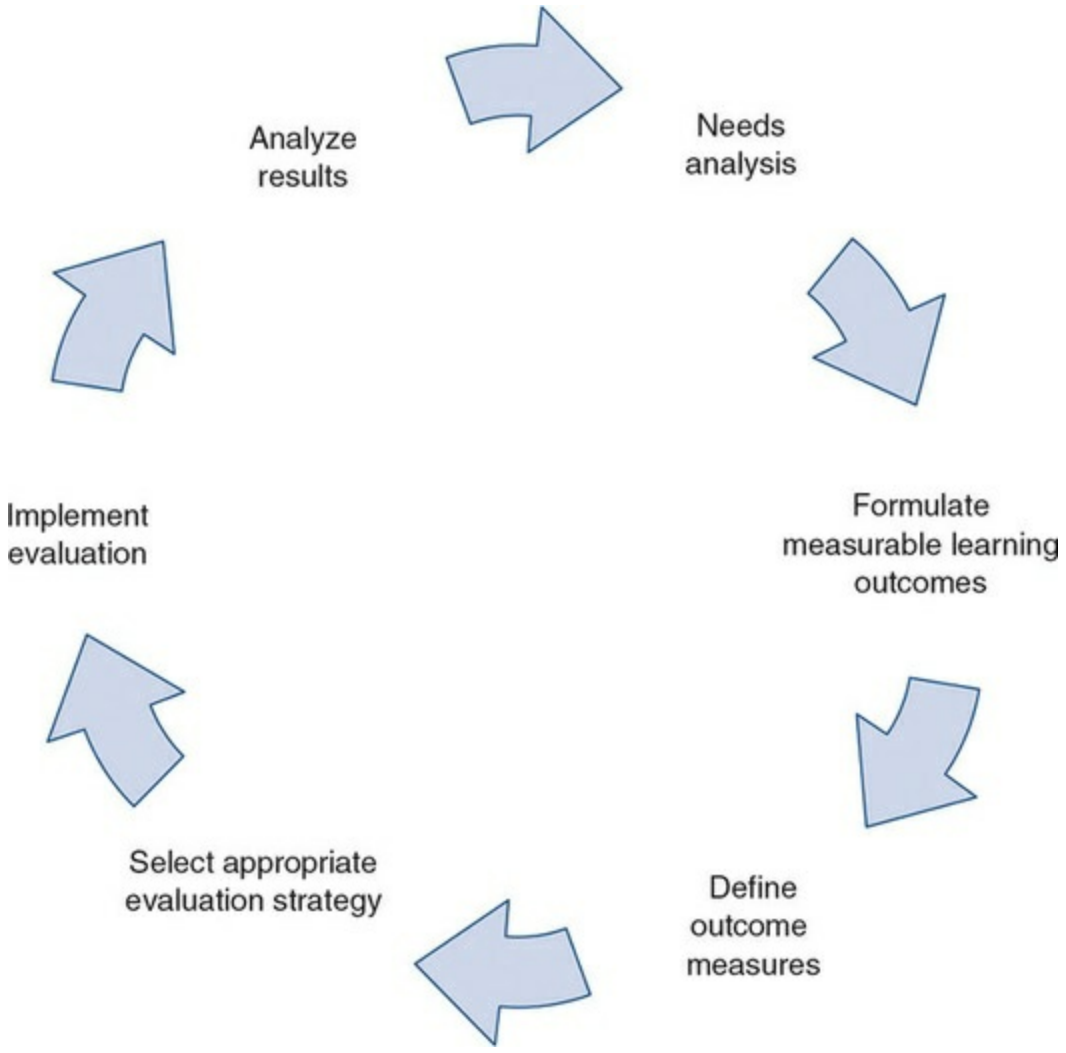
> People often confuse the process of monitoring, validation and evaluation. The purpose of monitoring is to take the temperature of a learning event from time to time, picking up any problems or emerging needs. Validation measures the achievement of learning objectives set for a learning initiative or process. Evaluation looks at the total value of that event or process, thereby placing it into its organizational context and aiding future planning. Faced with an evaluation task, there are four crucial questions to answer: why, who, when and how? (Harrison, 2005, p. 143)

Hence, the purpose of evaluation is manifold. Figure 11.2 shows that training initiatives must attain internal and external consistency to be effective. Thus, training is frequently validated under these aspects. Internal and external validations assess the degree to which stipulated T&D objectives are attained (Stewart, 1999). The purposes of evaluation discussed in the literature are plentiful (see, e.g., Bramley, 1991; Gibb, 2002; Thomson, 2008) and range from the “very vague” to the “very specific” (Marsden, 1991). The primary purposes of evaluation could be summarized as in Table 11.6.

So what should be evaluated? As a rule, criteria for evaluation should be based on the training objectives (see Figure 11.3). In addition, the criteria ought to be relevant; that is, they should not be contaminated (biased) or

deficient. However, criteria should also be reliable, practical, and discriminative. Training outcomes fall into a number of distinct categories. The number of training evaluation models in the literature seems almost infinite. Kirkpatrick (1960, 1994) suggests four levels of outcomes: reaction, learning, behavior, and results. Warr, Bird, and Rackham's (1970) CIRO framework also has four levels: context, inputs, reactions, and outcomes (immediate, intermediate, and ultimate). Easterby-Smith (1986) suggests a CAPIO framework comprising context, administration, process, inputs, and outputs. Finally, individual outcomes of training programs have been identified as falling within **Bloom's taxonomy** of learning domains (cognitive, psychomotor, and affective), which is one of the most widely used models to describe learning outcomes (Bloom et al., 1956; Bloom, Masia, & Krathwohl, 1964). A comparison of these and other frameworks reveals a significant overlap between these evaluation models, as well as between a number of the key learning outcomes contained within them. Nevertheless, a recent study (Saks & Burke, 2012) suggests that within the Kirkpatrick (1960, 1994) framework, only behavior- and results-related evaluations of training were correlated with higher levels of learning transfer.

Figure 11.3 The Evaluation Process



Source: Developed from Noe (2002).

TABLE 11.6 ■ Purposes of Evaluation	
Summative	Quantitative in nature; establishes whether T&D program was effective, was efficient, has added value, and has met its objectives
Formative	Qualitative in nature; assesses how training, learning, and development can be improved, that is, how they could be made more efficient and effective
Learning	Quantitative and qualitative assessment of learner's post-training performance to evaluate whether learning transfer has occurred
Power and Politics	Subjective in nature; is used to serve the interests of specific stakeholders within the organization

Source: Based on Easterby-Smith (1986).

Source: Based on Easterby-Smith (1986).

The key objective of any evaluation process will be to assess the broad range of individual and organizational outcomes as well as return on investment (ROI). Hence, one of the key considerations will be whether a T&D program has had any measurable impact on the firm's bottom line, so as to justify training expenditure and training budgets. The following section will consider some of the complexities involved in establishing the costs and the actual benefits of T&D initiatives.

Training Metrics and Cost-Benefit Analysis

The costs involved in training can be established relatively easily. These overheads can be substantial and involve direct costs and indirect costs (Noe, 2002). (See Chapter 7 for information on cost-benefit analysis.) A considerable direct cost is the loss of production sustained through the absence of trainees from work for the duration of the training. e-Learning significantly reduces this element of direct costs, as trainees generally do not have to leave their place of work to participate in online training (provided they have access to a computer). Online courses may also be taken outside of work. In many cases, employees can avail themselves of online training through an intranet, which can be accessed from work and from home, thus allowing for greater flexibility at a reduced cost.

However, the actual benefits to the firm may be much more difficult to ascertain, as many of the benefits take a long time to materialize or can often be of an intangible nature. Moreover, it may prove almost impossible to isolate completely from other organizational variables the effects of training on performance. Ascertaining these effects is of great significance, though. In fact, this preoccupation with the quantification of the business benefits of training has frequently been described as the search for the "Holy Grail," and those organizations that evaluate training employ a number of different models and approaches to pursue this quest, including the balanced scorecard (Kaplan & Norton, 1992, 1993) and ROI (Phillips, 1996b). Russ-Eft and Preskill (2005) highlight three critical factors in HR development evaluation that complicate the assessment of training outcomes:

1. Evaluation occurs within a complex, dynamic, and variable environment.
2. Evaluation is essentially a political activity.
3. Evaluation ought to be purposeful, planned, and systematic.

Notwithstanding these factors, Phillips (1996a) advocates that any available post-training data should be analyzed and converted into monetary values to establish ROI. Phillips's (1996c, 2005, 2012) ROI methodology (or ROI process) produces six types of data, which are based on **Kirkpatrick's** (1960, 1994) **evaluation taxonomy**:

1. Reaction, satisfaction, and planned action
2. Learning and application
3. Implementation
4. Business impact (see Table 11.6)
5. ROI
6. Intangibles

The ROI method advocates five useful steps for converting hard (tangible) data and soft (intangible) data into monetary values:

1. Focus on a single unit of improvement in output, quality, or time.
2. Determine a value for each data unit.
3. Calculate the change in output performance directly attributable to training.

4. Obtain the annual amount of the monetary value of the change in performance.
5. Determine the annual value (the annual performance change times the unit value).

Having identified relevant data sources and applying these best practices, firms can use a number of approaches to quantify the relationship between training costs and benefits. These approaches are shown in Table 11.7. Organizations may use one or more of these ratios to determine the costs and benefits of planned and existing learning technology projects.

It is possible to enter basic values into a spreadsheet application to calculate the ratios listed in Table 11.6. However, the variety of possible outcomes from training, the variety of factors that affect these outcomes, and the variety of data to be collected to produce any meaningful results appear to make the evaluation process a rather tedious task that would be next to impossible to complete efficiently and effectively without the help of a computerized system. Most commercial HRIS can be customized to record, analyze, and report on the training metrics that have been identified by a firm. For instance, the system could be configured to collect information on the monetary benefits of T&D projects, such as increased production output or a reduced number of complaints, and compare this information with data collected on the costs of T&D projects. In addition, the satisfaction with or the success of particular training interventions could be assessed. T&D data will usually be stored in the T&D module of the HRIS. The human capital management (HRM) modules included in the HRIS of the largest enterprise resource planning systems (e.g., SAP or Oracle) incorporate functionalities for creating employee development plans, competency management tools, and online learning environments, as well as numerous training metrics. In addition, many dedicated T&D systems are commercially available. The following section will discuss the data elements and various HRIS applications used in the training function.

HRIS Applications in Training

Traditionally, training software applications have been employed to record information associated purely with training administration purposes (Noe,

2002). Today, firms place much greater demands on training applications in terms of compatibility with existing systems, analytical functionality, and accessibility to meet business needs. The primary demand on any system, however, must be that it furnishes usable information to key decision makers to achieve both administrative and strategic advantages (Kovach, Hughes, Fagan, & Maggitti, 2002).

TABLE 11.7 ■ Cost-Benefit Approaches

Approach	Explanation
Benefit-cost ratio (BCR)	Monetary benefits of T&D projects Costs of T&D projects
Cost-benefit ratio (CBR)	Costs of T&D projects Monetary benefits of T&D projects
Payback period	Costs of T&D projects Annual savings
Return on investment (ROI)	Monetary benefits of T&D projects Costs of T&D projects

Source: Sadler-Smith (2006).

Source: Sadler-Smith (2006).

Hence, useful HRIS information should possess three key characteristics:

1. It must be presented in a user-friendly manner and must be easy to use.
2. It must be meaningful and appropriate (Keebler & Rhodes, 2002).
3. It must be used effectively in the decision-making process to support an organization's overall business strategy (Kovach & Cathcart, 1999).

According to the Society for Human Resource Management (2011), HRIS training and development applications need to have the following characteristics:

- Be easy to use
- Be customizable
- Be integrated with other HR systems and functions
- Offer a fully digital experience

- Provide mobile access to all users
- Be integrated with social media platforms
- Be available as software as a service

However, Kovach and Cathcart (1999) argue that an HRIS does not need to be intricate or even computerized to serve the information needs of a business. Elementary HRIS training databases are easily set up using commercial or open-source desktop software (see Figures 11.4 and 11.5). These databases may then be used to collect, store, and analyze training-related HR information. The amount of data that can be stored, the manner in which it is collected, and the level of analysis possible will depend on the application used. Table 11.8 shows the basic data elements an electronic T&D database should contain. The first column, "Data Element," shows the main categories of data elements, while "Subcategory 1" and "Subcategory 2" provide examples of the type of information these data elements could include.

Using these essential data elements, we could create a spreadsheet (see Figure 11.4). This basic database contains relevant training information and possesses limited search and reporting capabilities. Should a firm decide to upgrade to commercial training software, data stored in a spreadsheet can be imported into most training applications.

Clearly, both the amount of information that can be collected and stored using a spreadsheet and the level of analysis that this application permits are limited. Therefore, many organizations create bespoke databases, which offer greater possibilities regarding the collection and presentation of training data. These database applications allow users to run queries using customizable search criteria; they provide greater reporting options; and information on different screens can be linked to avoid multiple entry of data. An example of such a database, one that includes the data elements and subcategories of Table 11.8, is shown in Figure 11.5. As more functionality is desired, organizations can also use a more sophisticated learning management system (LMS) to collect and manage training data (see Figure 11.6).

As firms grow in size, their need to manage training activities and training data more effectively and efficiently increases accordingly. A host of commercial systems service the broad spectrum of T&D, ranging from stand-

alone training administration software to fully integrated expert systems. T&D software is available in many guises. The most common applications are discussed here.

Figure 11.4 Example of an HRIS T&D Database in Spreadsheet Format

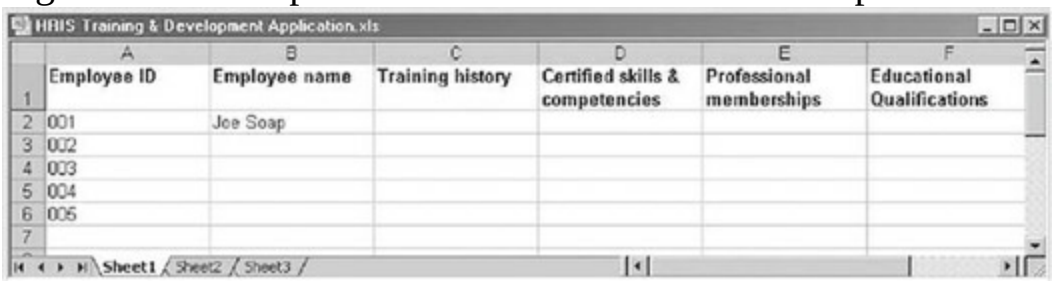


Figure 11.5 Example of a Database

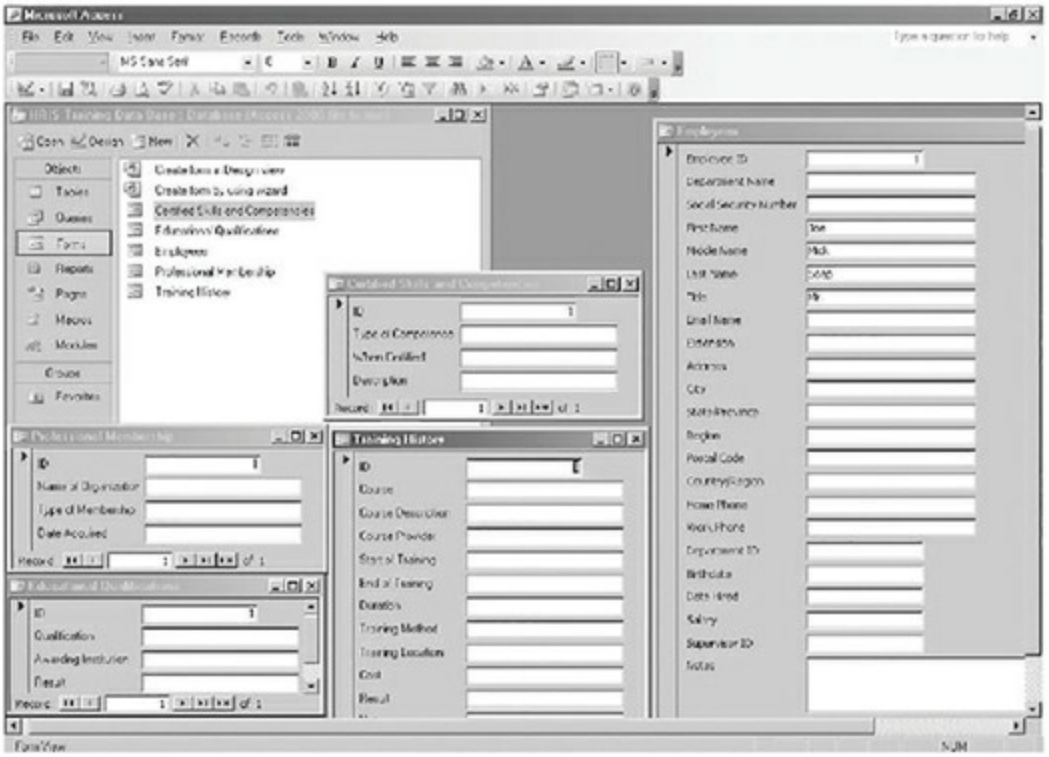


TABLE 11.8 ■ Basic Data Elements for an HRIS Training Database

Data Element	Subcategory 1	Subcategory 2
Employee information	Employee ID	
	Employee name	Title
		First name
		Middle name
		Second name
	Social Security number	
	Department	
	Position	
	Reporting to	
Training history (training course completed)	Date of training (start and end)	
	Training methods	
	Course (including description)	List of common courses
	Course provider	List of common providers
	Training location	In-house
		Out-of-house
	Result	
	Duration	
	Cost	
	Notes on performance	
Certified skills and competencies		
Professional memberships		List of professional organizations
Educational qualifications		

HRIS/Learning Applications: Learning Management Systems

The vast majority of large organizations rely on fully integrated enterprise-wide systems, called enterprise resource planning (ERP) systems, to satisfy their information needs. An ERP system amalgamates the management

information systems (MIS) capabilities from all functional areas in a business, for example, finance, production, marketing, and HRM, into a single integrated system. The ERP component that supports the HR function is commonly referred to as an HRIS. These data repositories for HR-related data typically comprise a number of modules, which in turn can support every area of HR, including T&D. Traditionally, firms used HRIS T&D applications and modules for administrative purposes only. The capabilities of today's HRIS T&D applications—learning management software that is usually bundled into a **learning management system (LMS)**—range from training administration to training and talent management. The uses and capabilities of an LMS are shown in the LMS classification presented in Table 11.9.

TABLE 11.9 ■ Learning Management System Classification

Classification	Uses and Capabilities
Administration	Basic employee and T&D records Calculation of training costs Administrative permissions (who has data access, who can enter data)
Training management (including learning content management)	Scheduling and access to training courses Setup of training courses and initiatives Assignment of training based on skills and certification requirements Authoring of training courses and initiatives Online access to courses Training evaluation Tracking of training attendance and results ROI measurement
Talent management	KSA assessment Performance reviews and appraisals Recruiting Succession planning Career planning Management development

Source: Adapted from e-Learning Consulting (2007).

Source: Adapted from e-Learning Consulting (2007).

The use of administrative systems is restricted to transaction processing, including the calculation of training costs. Training management systems can facilitate the entire T&D process (see the systems model of T&D described previously) from TNA to training evaluation. A **learning content**

management system (LCMS), as the name implies, can be used to store and develop T&D content, such as multimedia files, templates for training courses, or assignments. It may also be employed to track training attendance and completion records or for quality assurance purposes. LCMS is frequently used in combination with REL. A **talent management system (TMS)**, sometimes referred to as a human capital management system, is an integrated software suite that can comprise a range of applications, such as applicant tracking, succession and career planning, performance management, compensation and benefits management, and learning management. Talent management systems allow employees to create personal electronic *talent profiles*, which can be updated and usually reflect their KSA and goals. Organizations can use these data to generate information on the talent profile of the organization and to develop macro- and micro-level employee development plans. A large number of commercial learning management systems exist (see Table 11.10 for a list of vendors). These range from off-the-shelf products to server and Web-based enterprise solutions. The choice of system will be determined principally by an organization's LT&D needs, LT&D budget, and ICT capabilities. The reporting, analytical, and strategic potential of these systems will diverge accordingly.

TABLE 11.10 ■ Leading Learning Management System Vendors

Vendor	Website	Twitter
Blackboard	www.blackboard.com	@Blackboard
Brightspace	www.brightspace.com	@_Brightspace_
CallidusCloud Litmos	www.litmos.com	@Litmos
Cornerstone	www.cornerstoneondemand.com	@CornerstoneInc
DigitalChalk	www.digitalchalk.com/	@digitalchalk
IBM Kenexa	www-03.ibm.com/software/products/en/ibm-kenexa-lms-on-cloud	@IBMKenexaRPO
Instructure Bridge	www.instructure.com	@Instructure
Latitude Learning	www.latitudelearning.com	@LatitudeLMS
Meridian KSI	www.meridianksi.com	@MeridianKS
Moodle	www.moodle.org	@moodle
NetDimensions	www.netdimensions.com	@NetDimensions
SAP SuccessFactors	www.successfactors.com	@successfactors
SilkRoad GreenLight	www.silkroad.com	@silkroadtweets
SkillSoft	www.skillsoft.com	@Skillsoft
TalentLMS	www.talentlms.com	@TalentLMS
TOPYX	www.topyx.com	@TOPYX

The degree to which learning management systems can assist strategic decision making may be assessed using Beckers and Bsat's (2002) **decision support system (DSS)** classification. Their model consists of five levels:

1. Management information systems (MIS)
2. Decision support systems (DSS)
3. Group decision support systems (GDSS)
4. Expert systems (ES)
5. Artificial intelligence (AI)

Each consecutive category offers the users more extensive reporting and analytical capabilities that can support strategic T&D decision making. MIS can be used to support T&D decision making at the operational, functional level of the organization. DSS and GDSS are designed to facilitate senior

management decision making in the long term and relate to the overall mission and objectives of an organization. They are based on “what-if” scenarios. Expert systems consist of a knowledge base, a decision-making function, and an interface. They replicate the decision-making capabilities of human experts. An example of a system that uses AI is an intelligent tutoring system (ITS). An ITS can be employed to tutor, coach, or empower employees. The advantages of these systems are that instruction can be aligned with learner needs, the system can respond to learner actions, and learner progress can be modeled (Noe, 2002). ES and AI aid strategic T&D decision making at the board level of the organization. However, capital investments in sophisticated HRIS T&D applications alone will not necessarily improve LT&D in the organization, nor will they lead to knowledge creation or organizational learning. Any HRIS project requires careful planning and ample resources (time, money, and expertise). Bonadio (2009) puts forward five key issues that could enhance the effectiveness of an LMS:

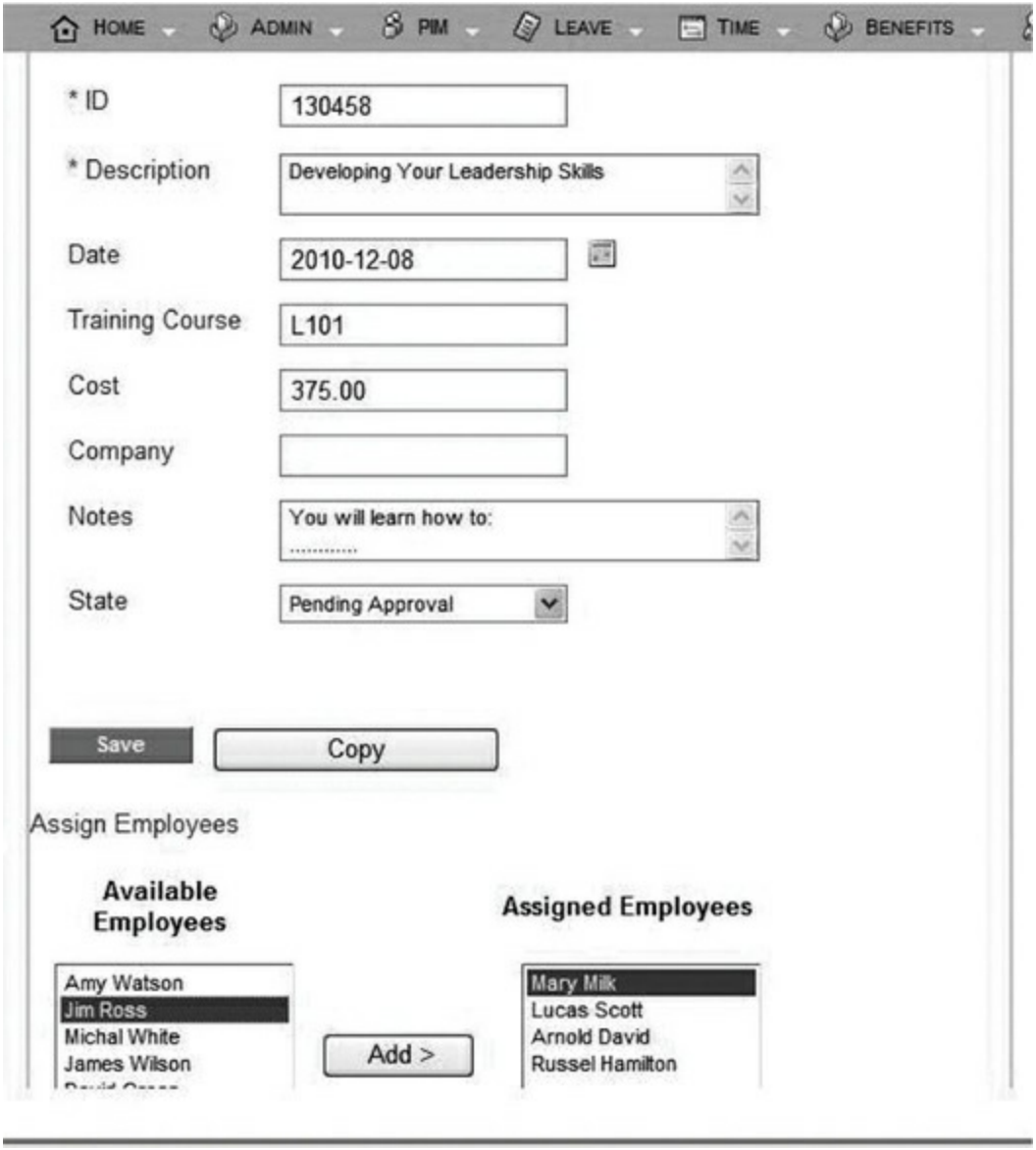
1. Employee development should be linked to learning delivery.
2. Learning activities ought to be aligned with business objectives.
3. Regulatory compliance must be maintained.
4. Learning effectiveness must be measured throughout the organization.
5. An integrated approach to employee onboarding (employee orientation) should be established.

HRIS T&D Applications: Implementation Issues

Many HRIS T&D projects fail to meet the expectations of key decision makers. The reasons for these failures are manifold. Some firms introduce a new TMS only because competitors have done so, yet these companies may not have the necessary expertise to operate the system. Frequently, decision makers have false expectations of ROI or apply training metrics that merely focus on cost savings and fail to take note of intangible gains derived from T&D (see the section “Training Metrics and Cost-Benefit Analysis”). In other cases, the HRIS T&D application strategy is not aligned with training needs and the overall T&D, HR, and business strategies. Few organizations involve employees during the implementation stage of the HRIS, which can lead to underutilization and dissatisfaction with the system (Burbach & Dundon,

2005). For a variety of reasons (see “Disadvantages” in Table 11.5), many employees never actually complete the e-learning programs in which they are enrolled. Sometimes, disenchantment is simply the result of poor planning and the consequent incompatibility of various disjointed HR systems, albeit an increasing number of organizations purchase one or more items of their training management system from a single vendor to prevent these problems (Frauenheim, 2006). A number of authors have suggested success factors for the introduction of HRIS T&D applications (Gascó, Llopis, & González, 2004; Noe, 2002; Sadler-Smith, 2006; Troshani, Jerram, & Rao Hill, 2011) and for increasing e-learning usage and completion rates (Brown & Charlier, 2013; Frankola, 2001):

Figure 11.6 Training Module With OrangeHRM (an Open Source HRIS)



Source: OrangeHRM (www.orangehrm.com). Reproduced with permission.

- Align e-learning strategy with T&D strategy, HR strategy, and overall business strategy.
- Create a corporate learning culture that fosters e-learning and the use of HRIS T&D applications.
- Assess HRIS T&D projects based on their suitability to meet the T&D strategy of the organization rather than the technical sophistication and

elegant features of the system.

- Carefully plan HRIS T&D projects to guarantee compatibility with legacy systems, affordability in terms of budget allocations, and the existence of expertise to use the system.
- Involve line managers and employees in HRIS T&D projects to ensure greater buy-in.
- Match HRIS T&D applications and e-learning initiatives with their ability to meet training needs to encourage learning transfer.
- Establish a suitable evaluation strategy to assess the extent to which training technology meets training needs, and evaluate this fit regularly.
- Identify suitable T&D metrics that take account of all direct and indirect training outcomes.
- Promote the benefits and create a sense of urgency toward the use of HRIS T&D applications and e-learning.
- Make managers accountable for the uptake of e-learning and for HRIS T&D utilization.
- Create an organizational climate where use and knowledge transfer of e-learning by employees is supported.
- Reward employees for their use of e-learning.
- Ensure that e-learning and T&D systems are user-friendly and provide quality information.
- Develop a data security policy for the T&D system and applications.
- Do not focus on only financial gains from HRIS T&D projects.
- Train managers and employees in the use of T&D technologies.

Summary

This chapter highlighted the strategic importance of LT&D in an increasingly knowledge-intensive global economy. The discussion showed that it is important to distinguish between learning, training, and development to understand the processes that lead to the acquisition of knowledge, skills, and abilities. Other key concepts, such as knowledge management and the learning organization, were also explained. Knowledge creation, innovation, and organizational learning are inextricably linked to an organization’s capacity to remain competitive. This chapter identified and explained various e-learning methods, their role in knowledge acquisition, and their advantages and disadvantages. Nonetheless, traditional face-to-face methods still carry

considerable credence, which is reflected in the increasing use of blended learning, an approach that combines both traditional and online methods of learning. Notwithstanding the effect of face-to-face learning, emerging Web 2.0 and Web 3.0 technologies, such as social media and mobile learning, furnish organizations with a multitude of exciting new ways in which LT&D can be delivered and measured. The key differences to early e-learning options are that the learners actively participate in creating the learning materials and that learning increasingly occurs in an informal virtual and social setting among peers rather than in the training rooms of a corporation. A careful analysis of training needs, various LT&D methods, and individual learning styles is necessary to ensure that transfer of learning occurs and that, ultimately, the strategic objectives of the organization can be attained. HRIS T&D applications are vitally important tools in pursuing a systematic approach to LT&D, which necessitates identifying training needs, designing LT&D solutions and methods, implementing these initiatives, and evaluating the effectiveness of training (including completing an assessment of ROI on training). As many LT&D outcomes are of an intangible nature or take a long time to materialize (note the definition of development in this context), it is inherently intricate to determine appropriate training metrics that may be employed to perform any meaningful CBA. The key is to analyze any available data. Notwithstanding these difficulties, a number of approaches to ascertain ROI using HRIS T&D applications were offered. This chapter also expounded on how an elementary T&D system can be created using a spreadsheet or database desktop application. A variety of HRIS T&D applications exist. Learning management systems may be embedded in an HRIS or ERP. These learning management systems vary considerably in their capacity to manage the training process, generate reports, or assist in strategic decision making. Talent management suites integrate a range of applications, including succession planning and learning management. Learning management systems with DSS and ES capabilities offer the greatest strategic value. However, the choice of system is contingent on the T&D needs of an organization, its budget, and its ICT capabilities. This chapter concluded with a discussion of the implementation of HRIS T&D applications.

Key Terms

Discussion Questions

1. What is the systems model of T&D? Discuss how HRIS T&D applications can assist in carrying out the steps in the systems model.
2. Explain synchronous and asynchronous communication in relation to e-learning.
3. What are the advantages and disadvantages of e-learning?
4. How can HRIS T&D applications help firms foster organizational

learning?

5. Explain how organizations should choose appropriate T&D methods.
6. What is transfer of training? What role does transfer of training play in e-learning?
7. Explain the issues involved in establishing ROI for T&D initiatives. What role do HRIS T&D applications play in establishing ROI?
8. Outline how standard desktop applications such as a spreadsheet or database can be used to set up a basic T&D system.
9. Discuss the different types of HRIS T&D applications and their reporting and decision-support capabilities.
10. What issues might arise during and as a result of the implementation of HRIS T&D applications?

Case Study: Training and Development at Meddevco

Meddevco (name changed) is a large multinational corporation that operates in the medical devices sector. The firm employs around 33,000 people in five divisions and has operations in 120 countries. A total of 66% of the multinational's revenue is generated from products that are less than two years old, and 80% of employees are working on products that are less than two years old. These figures illustrate the highly competitive and fast-paced nature of the medical devices sector. This sector is also characterized by high levels of regulatory control and a need to comply with industry norms. Meddevco is headquartered in the United States and Switzerland. The information needs of a firm of this size are substantial, and it would be next to impossible to collect, store, and analyze HR-related information without the use of a fully integrated global HRIS. Moreover, the diversity of the workforce, the multiplicity of skills required in the different divisions and to support the various product lines, and the pressure of compliance necessitate a perfectly orchestrated T&D effort. Needless to say, HRIS T&D applications play a major role in managing the T&D function. Meddevco uses an HRIS by PeopleSoft (now Oracle) to manage the majority of its global HR processes, including e-recruitment and performance appraisals. With regard to data entry into the system, the corporation operates a strict "no customization unless legally required" policy to ensure data compatibility across the system. In the

United States, most HR services are centralized in an HR shared services center. The corporation has a dedicated HRIS center in Europe, and negotiations are ongoing to implement a European HR shared services model. The company uses a number of different payroll systems in Europe for compliance reasons. All employees in the corporation have access to a company intranet called My Meddevco, which also includes a learning portal that provides access to online training programs, which employees can use at work and at home. The intranet also includes a knowledge base and detailed company information, including a full listing of all employees and their job titles and locations. Employee transfers and promotions are also listed. A number of years ago, the corporation made the decision not to use the training module included in PeopleSoft and opted for a training management system called SABA to coordinate and manage training initiatives; for example, the recent rollout and training for the use of SAP (an ERP system) for production facilities was managed through SABA. In addition, Meddevco has recently commenced using the talent management module included in PeopleSoft to identify and track high-performing employees for promotion. Every employee is required to complete an online talent profile, which is similar to an online CV and which can be updated by the employee. The combination of systems and applications and the careful analysis of HR information contained therein allow the organization to develop and implement a global T&D strategy. However, the firm also faces some challenges arising from the use of these systems. As the organization largely grew through acquisition, a number of legacy systems still coexist with the global HRIS at some of its subsidiaries. Data compatibility issues also derive from the use of SABA, which is not part of PeopleSoft. In addition, the firm is also using SAP, and it is questionable whether Oracle (the owner of PeopleSoft) will support data exchanges with a system supplied by its chief competitor. Furthermore, because Meddevco did not involve the workforce in the implementation process of the TMS, employees are reluctant to complete their talent profiles. Moreover, the need to customize the HRIS locally to comply with the national legislation affecting Meddevco subsidiaries further complicates the collection and transfer of data within the global HRIS.

The example of Meddevco illustrates how large organizations employ HRIS to manage their workforces and how they leverage HR development through the use of HRIS T&D applications, learning portals, and specialized learning

management systems. However, it is also apparent that careful planning is essential to avoid compatibility issues and to ensure a consistent global flow of HR- and T&D-related information.

Case Study Questions

1. What should Meddevco have done to avoid some of its problems?
2. How could Meddevco now solve the problems created by not involving employees during the implementation of the HRIS?
3. What else should Meddevco do now to improve the operation of its system?

Practical Exercise

Try to set up an interview with someone from a company such as FedEx, UPS, or Amazon with a view to discussing corporate training initiatives and the effects of these on employee retention, development, and performance. In particular, try to establish the role and integration of HRIS in the organization's training programs and how HRIS is being used to increase the efficiency and effectiveness of training initiatives.

Industry Brief: Richard Gegenwarth, Director of Change Management and Learning

Learning and Development (L&D) plays a key role in shaping the workforce of the future. This is a time of great opportunity for L&D, with a more dynamic means of delivering content and a convergence with core ERP systems and data analytics that provide L&D with ability to demonstrate the financial value of learning investments. It is also a time of challenge, because L&D professionals must integrate new technologies and deliver on the expectations of a new generation of employees and stakeholders, all while balancing investments in HR systems, existing knowledge assets, and leading practices for adult learning.

Healthcare providers are a great case for the evolving role of L&D. These complex organizations bring together medical research, teaching, and

treatment teams with many deep specialists involved in addition to sophisticated operational, administrative, and functional teams. Providers are moving to new delivery models that can elevate care outcomes, improve patient experiences, and achieve efficiency and safety goals. Learning teams play a central role in successfully building new skills and measuring outcomes.

One of the common challenges for learning teams is the development of management and leadership skills for physicians. Surgeons, for example, rise to the top of their field based largely on their skills in the operating arena, but are often then tasked with managing teams, surgery centers, and facilities, for which they are less prepared to lead. Leading hospitals are making investments in leadership programs to address this situation, are using integrated HR and operational data to inform the selection of participants and to measure the effectiveness of these programs. A mixed approach is used that takes physicians out of the clinical setting for an intensive opening experience and then provides them with on-demand videos, virtual learning, and coaching to practice over an extended period on the job at a time that is convenient for the physician.

In addition, training the broader workforce on the mandated Electronic Health Record systems, new codes for classification of diseases and related health problems, and reporting of various hospital and physician quality and outcome measures are critical for these organizations. Professionals in these environments need training and development experiences to work within their highly variable and demanding schedules, and hospitals need to be able to monitor course completion, understand the efficacy of training, and how training impacts team performance and patient outcomes.

Increased sophistication in the capture, aggregation, analytics, and reporting of operational data places L&D organizations in a position to measure higher-level returns on training investments in a much more rigorous manner than was previously possible. In conjunction with operational outcomes (e.g., patient health outcomes, efficiency, lapses in clinical standards) learning systems allow organizations to more efficiently address concerns and update employee skills. Finally, organizational adoption of cloud-based systems is acting as a catalyst to upgrade L&D capabilities and services. HR

technologies offer new ways of providing content and access for learners at their point of need, so employees can enjoy both a richer and more targeted learning experiences.

Student Study Site

Visit the Student Study Site at **study.sagepub.com/kavanagh4e** for additional learning tools such as access to SAGE journal articles and related Web resources.

12 Performance Management, Compensation, Benefits, Payroll, and HRIS

Charles H. Fay

Renato E. Nardoni

Editors' Note

This chapter is the fourth one involving an organization's talent management program and its utilization as aided by an HRIS. It completes our look at the cycle of activities involved in talent management—planning and forecasting the need for talent (Chapter 9), recruitment and selection of talent (Chapter 10), and training for talent management (Chapter 11). As noted previously, the purpose of talent management is to achieve the organization's strategic goal of remaining competitive in its market. This chapter describes the role of performance management as part of the talent management process, and how in concert they maintain market competiveness for the organization. The authors focus on the management of employee performance in a systematic manner. This includes both the formal performance management system as well as the reward system that supports the evaluation. The reward system of the organization involves the design, decision making, and administration of both compensation and benefits practices. Throughout the chapter, the authors discuss the role of technology in supporting the data needs for organizations as they implement performance management, compensation, and benefits systems.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the performance management (PM) cycle and the role of the HRIS in PM design, decision making, and administration
- Understand typical compensation practices and the role of the HRIS in compensation design, decision making, and administration
- Understand typical benefits practices and the role of the HRIS in benefits design, decision making, and administration
- Understand payroll systems and the role of the HRIS in payroll administration
- Be able to discuss the meaning of work to employees in terms of their identities and self-esteem
- Discuss a motivation theory that helps to understand why work is so important to employees and how the HR programs in talent and performance management affect employee motivation

HRIS In Action

As Mark walked into his work area, he was fuming. “Those idiots in HR and payroll are really the gang that couldn’t shoot straight,” he announced to everyone in the vicinity. “What did they do now?” asked Marsha. “Don’t tell me they got it wrong again!”

“They sure did,” said Mark. “After I complained last month, you’d think they would at least check to make sure they corrected their mistake. If I treated a customer this way, I’d get fired!”

Mark’s paycheck is wrong once again, and the story is a complicated one. It started with the performance review Mark had received from his boss the previous month. The review was good, and Mark had earned an “Exceeds standards” summary rating. Somehow, when an HR data-entry clerk entered the approved rating into the system, an error was made, and “Does not meet standards” went into the compensation review system. The error snowballed, and Mark received no merit increase or bonus for the year. In fact, because of

increased deductions for health coverage, his check was actually smaller than the one he had received two weeks earlier. Apart from the financial costs, Mark was psychologically shattered because his boss had discussed in their performance review meeting how good his performance was.

After his boss intervened, HR and payroll corrected the error and noted that Mark would receive the expected increase and a one-time adjustment for back pay. On the strength of that, Mark made additional financial commitments. When the latest check was direct deposited into Mark's bank account, the mistake had not been corrected, and a check Mark had written was returned for insufficient funds. Payroll's excuse? HR had not received the approved changes at least one week prior to check issuance—payroll's deadline for changes.

How can errors like this be avoided? They are not uncommon. A large state university in the Northeast makes salary adjustments to faculty who receive performance increases in two stages: the adjustment becomes part of the biweekly paycheck in late spring, and the adjustment for January 1 through late spring is paid out as a lump sum in summer. Last summer, the back-pay adjustment was considerably higher than it should have been because of a data-entry error in the adjustment formula. No one caught the error until this year, when the university had to notify all faculty members that the back-pay adjustment for this year would be reduced by the excess adjustment received the previous year.

PM, compensation, benefits, and payroll are sensitive areas for most employees. The typical employee tends to "keep score" on his or her relationship with an employer through these systems. It is critical that information technology (IT) systems in these areas be flawlessly executed from the employee's perspective because getting the wrong (or no) paycheck sends a very bad message to the employee. Given the amounts of money involved, it is critical that IT systems in these areas be flawlessly executed from the employer's perspective as well.

In this chapter, we will provide an overview of PM, compensation, benefits, and payroll, so that you have an idea of the complexity that must be captured if the HRIS is to work well.

Introduction

> *Appreciate everything your associates do for the business. Nothing else can quite substitute for a few well-chosen, well-timed, sincere words of praise. They're absolutely free and worth a fortune.*
>
> —Sam Walton

Performance, rewards, and payroll systems focus on the basic exchange of inputs and outcomes between employees and employers. Employees provide performance, and, in exchange, employers provide rewards, which are distributed via payroll systems. These systems also serve as good examples of several IT issues in human resources management (HRM). **Performance management (PM)** systems are usually entirely internal to the organization, but data must be linked to several other systems, including rewards, staffing, training and development, and career development. PM systems are used as working tools by managers to motivate employees to perform well in their jobs and must, therefore, be inherently self-explanatory. Often, data are specific to the individual, although various summary measures must be comparable across subsets of employees or all employees. Since job performance is a function of individuals' knowledge, skills, and abilities (KSA) and their motivation to work, a good starting point to understand how a PM program works is to examine the meaning of work.

The Meaning of Work

For most of us, work takes up a large part of our time and effort and is our major source of income. It shapes our identity, is critically important in how we perceive ourselves, and affects our self-esteem and self-worth. Each is an important part of the meaning of work, and strongly affects our motivation to work and perform effectively. The employee-employer exchange is the basis of a work motivation theory called **Equity Theory** (Adams, 1963, 1965). Basing our discussion of PM in motivation theory is necessary since the primary purpose of a PM program is to both help align employee performance with organizational outcomes and to motivate employees to

perform well. Due to the importance of effective employee performance, we will cover the major tenets of Equity Theory.

How does the theory apply to work and management? All employees seek a fair balance between what they put into their jobs and what they get out of it. But how do we decide what is a *fair balance*? The answer lies in Equity Theory. Importantly, we arrive at our measure of fairness, or equity, by comparing our balance of effort and reward, that is, the ratio of input and outcome, with the balance enjoyed by other employees whom we deem to be relevant reference points. None of us like to feel that we are placing more effort into our work and receiving fewer rewards (e.g., salary, bonuses, benefits) than those around us. Equity Theory can therefore help explain why people can be happy and motivated by their situation one day, and yet with no change to their terms and working conditions can be made very unhappy and demotivated, if they learn, for example, that a colleague (or, worse, an entire group) is enjoying a better reward-to-effort ratio. Use of this theory can help us understand why people select one job over another, or seek a raise because one's coworker has gotten a raise. Thus, the effectiveness of the PM system in motivating employees' performance has its basis in Equity Theory.

In contrast to performance management systems, which are entirely internal to an organization, reward systems have both internal and external ties to multiple other information systems. Both pay and benefits must be linked (or linkable) to external survey data, legal requirement data, and internal systems such as budgeting and planning systems. Usage of parts of reward systems must be restricted to HR professionals, although other parts must be widely available to employees for self-queries. Most organizations consider rewards data to be highly confidential, so system security is critical. Reward systems data focus on the individual, small-group, unit, and organization levels for different purposes, and the same variable (e.g., value of a specific benefit, seniority, option value) may have to be defined, calculated, stored, and reported in multiple ways depending on the need.

In the case of payroll systems, flawless data integrity and even more flawless execution are critical. Anyone who has ever received an inaccurate paycheck will understand the frustration and anger that occur; a payroll system that is not flawless is an administrator's nightmare. Payroll systems must be linked

to external data (e.g., federal and state requirements for minimum wage) and internal data (e.g., general ledger, benefit choices) and must be capable of incorporating constant change. The payroll system is generally used only by payroll specialists, but every employee "audits" his or her own results. One final aspect of payroll is that some summaries of payroll data are not likely to match summaries of the same variables used in compensation or other HR systems. Even in a question as seemingly simple as number of employees, there will be discrepancies in these data summaries. For example, the compensation system is likely to contain only currently active employees; benefits might also include employees on leave, retired employees, and those former employees who have elected continuation of benefits under the **Consolidated Omnibus Budget Reduction Act (COBRA)** of 1986, and payroll files will contain everyone for whom a check is cut.

Although the interrelationships between performance management, rewards, benefits, and payroll are clear, and it is obvious that the human resource information system (HRIS) applications for these four functions need to interface seamlessly, it would be a mistake to assume that these four functions can be considered independently of other HR applications or, indeed, of any of the information systems operated by the organization. The HRIS must allow for all aspects of the employment relationship (including relationships with prospective and past employees that affect equity perceptions) to be considered, analyzed, and acted on. Neither managers nor employees see the relationship between the organization and the employee through a single lens. In turbulent times, it is difficult to predict how information may need to be used. The potential must be there for any datasets currently collected by the organization to be retrieved and analyzed based on the requirements of the problems faced, not on the bin in which the data currently reside.

This chapter focuses on the data inputs, the typical reports that are generated, data outflows to other systems, and the ways that the IT system can provide decision support to organizations and managers in the areas of PM, rewards, and payroll. Before that discussion can be meaningful, however, a brief overview of each of the areas is necessary. Although most employees have a good "feel" for performance management (after all, their performance was graded throughout their school years), few people not working in the field

understand the intricacies of compensation or benefits, and may assume payroll is just a bookkeeping task.

Performance Management

Overview

Performance management was first introduced in Chapter 9 as a critical part of talent management. This chapter examines performance management in more detail and relates it more closely to the other human resource functions that make up talent management.

Until recently, most discussion in organizations focused on the performance appraisal process. The emphasis was on getting the "best" appraisal format and training managers to "rate" employees using the format. Most research, whether by scholars or professionals, was on rating formats, rater error, and the training of raters. The assumption was that, if the correct format could be developed and managers were trained to use it, the resulting ratings would be accurate.

During the 1980s, professionals and some scholars became interested in a different goal: improving performance (Banks & May, 1999; Bernardin, Hagan, Kane, & Villanova, 1998). This interest led to a reconsideration of the whole performance process, and attention shifted to PM. The PM process consists of three parts: performance planning, **performance observation**, and providing **positive feedback** and/or **corrective feedback**. In support of this process, periodic performance summaries are developed to serve as a basis for performance planning for the next period, while providing data for a variety of HR decisions, including rewards, staffing, training, and other decisions affecting the employee's relationship with the organization. This description of the process of performance management is based on the motivational theory of goal setting (Locke & Latham, 1984, 1990a, 1990b).

The fundamental tenet of **goal-setting theory** is that goals and intentions are responsible for human behavior. After years of research on this theory, the evidence for this tenet was strong (Locke, Shaw, Saari, & Latham, 1981). On

the basis of this extensive research, several other tenets of the theory were verified. First, it was found that if goals determine human behavior, higher or more difficult goals result in higher levels of performance than those resulting from easy goals. Second, it was found that specific goals (such as reducing employee absences by 25%) result in higher levels of effort than vague goals such as “Why don’t we reduce absenteeism by 15%.” Third, it was found that incentives such as money, feedback, and competition will have no effect on behavior unless they lead to the setting and acceptance of specific, hard goals. It is clear that the whole performance process described above was based in some part on this theory since the theory and PM work.

PM is now considered within the framework of talent management, which encompasses all areas of HR that have to do with onboarding, developing, evaluating, and managing the workforce through all the normal cycles (see Chapter 11 for more complete coverage of talent management and HRIS). PM is just one of the areas connected to others such as

- recruiting (external),
- staffing (internal),
- career management,
- 360° assessment,
- development management/training,
- retention management, and
- workforce planning.

The model of contemporary talent management is shown in Figure 12.1.

Note that many organizations today, although having installed expensive and expansive enterprise resource planning (ERP) systems, which were supposed to provide a single platform for all these integrated applications, found that it was necessary to add specialized talent management solutions from third-party vendors to achieve the necessary functionality.

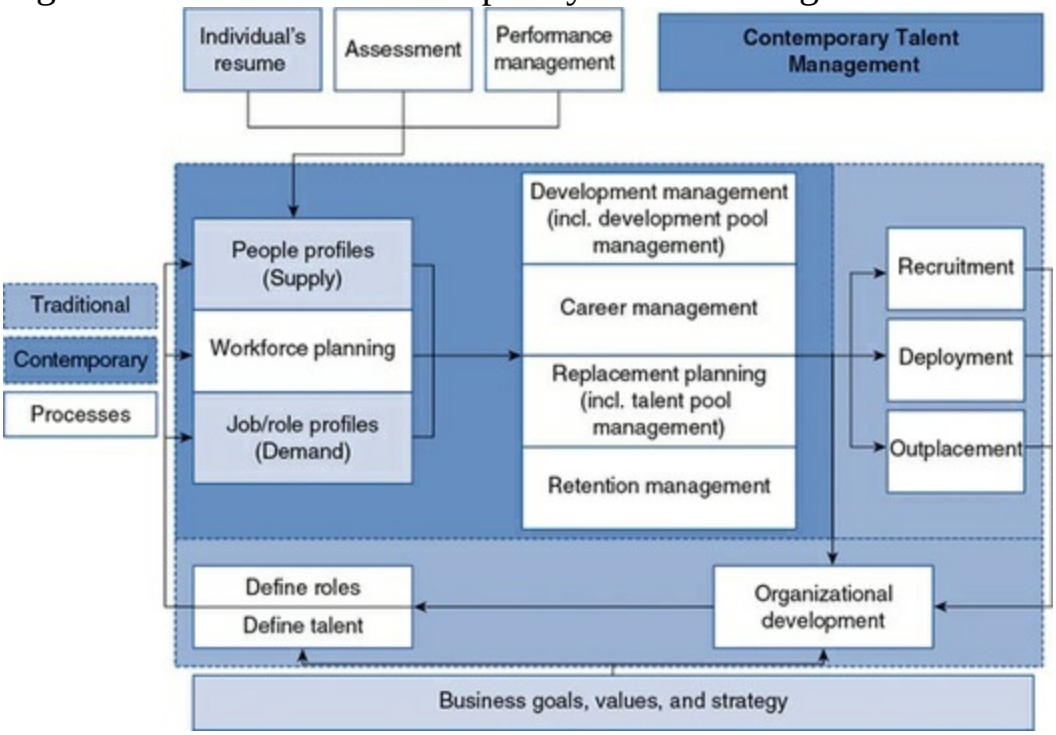
The link from the resulting performance and compensation processes to the core payroll systems, however, still remains as an integral link between the ERP systems and the specialized talent management solutions. This link would also be consistent with the findings from goal-setting theory. In the example given in the opening vignette, if there were an integrated talent

management system linking the performance module and compensation, there would be no need for anyone to enter the performance rating into the compensation system since the performance rating would have already been there as a result of the approved employee review.

Performance Planning

Performance planning, like most management processes, must be constructed in such a way that any manager can do it, regardless of management style or skills. Better managers involve the employee collaboratively in all phases of the PM process, but the system is designed so that even directive managers can follow the process. This discussion assumes that the manager is more directive than collaborative.

Figure 12.1 Model of Contemporary Talent Management



The manager must first define what performance means in the case of a specific **direct report** (i.e., the employee whose job performance is being evaluated). At the broadest level, this definition of performance would encompass any employee who fills the job position. Remember that the job position is described in terms of duties and tasks outlined in the job

description. Another way to conceive the definition of performance is that it is the performance expected of a new employee in the position if the direct report were terminated. Ideally, this definition is developed by a cascade of goals, fitting the research findings on goal-setting theory, beginning with the organizational strategy and operating plan, with the immediate source being what the manager is expected to accomplish during the period and ending with the direct report's expected part of that accomplishment (Evans, 2001). The manager must then move from the general to the specific, usually expressed in terms of desired outcomes. This constitutes the performance dimensions for the direct report and is consistent with the findings from goal-setting theory.

When outcomes are difficult to observe or measure, behaviors that are expected to lead to desired outcomes are added. For each performance dimension, the manager must develop specific outcomes and behaviors that will be used to measure the direct report's performance. For a performance dimension of budget management, an outcome might be "Stays close to budget for each budget category." A behavior on the same dimension might be "Checks expenditures against budget." After the measures are determined, the manager must set appropriate standards for each measure. The standard for "Checks expenditures against budget" might be "Checks expenditures against budget weekly." After defining standard performance, "Exceeds standards" and "Fails to meet standards" would be defined. The "Exceeds standards" level for "Checks expenditures against budget" might be "Checks expenditures against budget weekly; where discrepancies exceed 2%, checks those categories daily until discrepancies disappear." The "Fails to meet standards" level might be "Misses weekly check of expenditures against budget; allows discrepancies to continue without any follow-up." It should be noted that performance dimensions, measures, and standards are unique to each position, although attempts should be made to develop common standards for employees with identical job titles.

When performance dimensions, measures, and standards have been developed, the manager must communicate them to the direct report. The manager must make certain that the direct report understands measures and standards. The manager then gets the direct report to set goals for performance for the coming year. Note that goals and standards are not the

same thing. The standard is what is expected of a fully job-knowledgeable employee who exerts normal effort. One purpose of PM is to get employees to set stretch goals, to be better than the standard. At the end of the goal-setting discussion, the direct report has agreed on some performance level as a goal. The set of performance measures, with standards and goals, becomes the **performance contract** for a defined performance period, typically a year. Most effective performance management systems encourage more frequent performance conversations and reviews, rather than waiting for an annual review.

Formats

Most organizations define the performance instrument differently depending on the type or level of the employee. For example, a nonmanagement or clerical position may have a relatively standard set of criteria that requires little or no change year after year. On the other hand, management employees tend to use a format that combines both goals and objectives together with a competency evaluation. A well-designed performance application can automatically map the correct format based on the employee who has logged into the performance website.

For the management format, the performance evaluation can reflect a weighting of a goal portion and the competency portion (e.g., 60% of the overall rating will be based on the goals results, although 40% will reflect the competency ratings). Also, within each of these sections, a specific performance level for each goal or competency might be rated. Therefore, the overall result could reflect a weighted calculation of each goal, competency, and section. Web-based performance systems can easily perform these calculations for the user. Even if the organization prefers that the employee and/or the manager actually determine the overall rating, the system can provide advice as to the reasonableness of the entered rating versus the underlying ratings.

Performance Period

During the performance period, the manager uses the performance contract as

a benchmark for observing the direct report. When performance above standard is observed, the standard becomes the basis of positive feedback. When performance is below standard or below the goal set by the direct report, corrective feedback is used, again relying on the standard and on the goal set as the benchmarks for the performance observed. When discussion about performance is couched in terms of known measures, standards, and performance goals, feedback can be much more objective, and it is less likely to be seen as criticism of character. The direct report is not bad per se, but is simply not performing at the agreed-upon level on one or more measures. Stone, Deadrick, Lukaszewski, and Johnson (2015) note that employees will react differently from feedback from an electronic system than from a supervisor. This suggests that some combination of automated feedback and supervisory feedback is optimal in any performance management system.

Periodic Performance Summary

At some point, a summary of performance during the period is provided to the direct report. In most organizations, this is an annual event, but some organizations have quarterly or semiannual performance summaries. At this point, the manager provides a summary of how the direct report has done on each performance measure and whether standards and goals have been met. In performance systems that offer both the employee and the manager Web-based input capabilities, periodic review of the employee's progress toward achieving goals is much easier. Once the employee self-assesses her or his own performance, the manager can also review each goal while viewing the employee's comments (see Figure 12.2 for an example).

Consequences of achieving various performance levels are communicated, and planning for the next period's performance begins. If PM has been done correctly, the summary appraisal should have no surprises for the direct report. As shown in Figure 12.1, development is a critical component. One of the more important outputs of the performance process is an **individual development plan (IDP)** that is used to document any steps necessary to improve employee performance. Each employee should have an IDP.

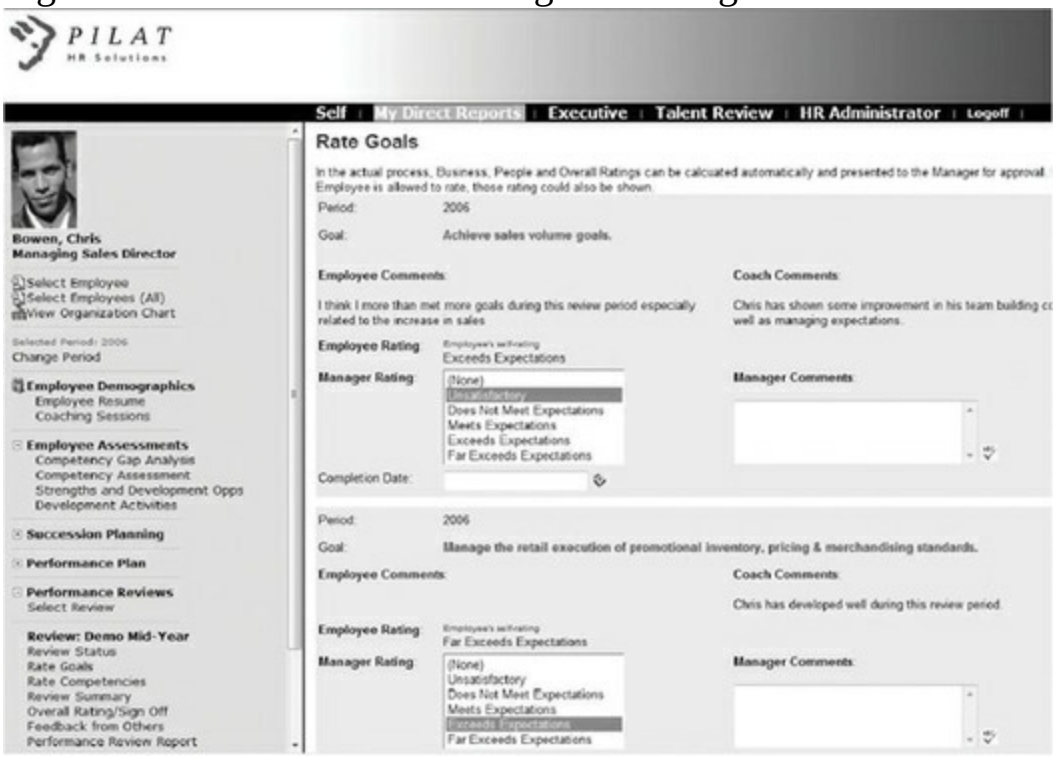
The process described above applies to PM at the individual level. Yet most employees today work as an integrated part of one or more teams. The PM

process does not change significantly for a team. It is usually easier to get outcome performance measures for a team than for an individual, and it is more difficult to get individual performance measures for a team member (Bing, 2004). Some organizations have elected to use team output as the primary outcome measure of performance for all team members and then develop a “team citizenship measure” for each team member.

Typical Data Inputs

Data inputs for PM systems include organizational-, job-, and individual-level data. Organizational-level data consist of links to organizational and unit goals and strategies and business plans. Performance plans should be able to tie back to unit and organizational plans; ideally, it should be possible to consolidate individual performance plans to the unit level and consolidate unit plans to the organizational level.

Figure 12.2 Performance Planning and Rating Module Screen



Job-level data is a significant part of the PM system. Key tasks, responsibilities, and outcomes should flow from job datasets to individual performance plans. Performance exists only within the context of the job.

Because performance begins at the individual level, most of the data in the PM system are individual-level data. Data include all the performance criteria developed by the manager for the individual, the particular measures that will be used to rate the individual's performance on each criterion, and the performance standards for each measure. If rating information is to be provided by more than the manager, the names of other raters and the criteria for which they will provide rating information need to be in the system as well. Usually, the entire performance contract will be a part of the system. Most systems will include space for the supervisor (and other raters) to enter observed performance and performance incidents. Contemporary systems allow both employees and managers to enter comments and observations at any time during the review period and provide the option of having all those comments swept into the final review, presenting them in a concatenated area for editing by users. There should also be space for documentation of positive and corrective feedback. While creating an IDP, many systems can recommend and provide a library of development activities that can be used to correct specific problems.

Performance management systems must interface with staffing and training applications. As an example, if certain jobs are hard to staff, the PM system will want to add the competencies required for that job so that more internal candidates can be surfaced. Similarly, training applications need to be coordinated with the PM system so that evaluation of training (and development) programs will be possible.

Typical Reports

The most important standardized reports produced by the HRIS are the performance contract and the annual summary appraisal for each employee. Other reports include aggregate performance data by unit and reports comparing aggregated unit performance with unit output (Cohen & Hall, 2005, p. 64). The HRIS needs to have the capability of archiving data so long-term performance trends for individuals and groups can be tracked. If competency assessments are used as a part of the review, the HR department can monitor systemic developmental requirements based on the aggregated competency results (e.g., those for business unit, location, or level).

Data Outflows

Performance data are used in many HRM decisions and will flow automatically into some processes or be available for others as needed. One automatic flow will be into compensation. Organizations with merit pay need performance distributions to construct a merit matrix. (Note that many performance applications are capable of having compensation functionality built in.) The performance measure used is the summary performance level for each employee. Performance data on various performance dimensions are used in decisions relating to promotion, layoffs, assignment to training programs, and developmental assignments. Performance data are also central to HR planning. Other applications that make use of performance data are training and development (so that training needs can be analyzed based on current weaknesses in employee performance) and staffing, where aggregated strengths and weaknesses of currently needed skills and competencies can trigger recruitment and staffing goals. In addition, performance processes utilizing competency assessment can be used by manpower planning applications to assist in forecasting future deficiencies based on required skill profiles.

Decision Support

The basic decision support system in the area of PM is the entire system. Having performance criteria, performance measures, performance standards, goal-setting results, and recent performance documentation in a single place allows managers to keep track of how each direct report is doing and what interventions need to be made to improve performance (Evans, 2001). This self-service feature for managers makes the performance management module a management tool for daily use. All performance management documentation activities required of the manager can be dealt with through the system. Performance planning, documented observation of performance, feedback documentation, and the formal appraisal can all be developed on the system itself and stored there for future reference by managers. Similarly, the system can provide self-service for employees by allowing them to view the same data and use those data as a basis for deciding on areas where improvement is needed. For example, were performance-specific goals set at

a high enough level to motivate employees to perform at higher levels on their jobs? Appropriate interfaces between the performance management module and training and development modules can lead either the manager or the direct report to training programs or other developmental activities based on the specific performance problems noted. Indeed, PM software can be categorized as either preformatted appraisal systems—systems that allow the development of customized appraisals—or systems that diagnose performance problems (Forrer & Leibowitz, 1991, pp. 104–106). Research suggests that as many as 93% of large organizations use electronic performance management systems of one type or another (CedarCrestone, 2014).

Flowers, Tudor, and Trumble (1997) note that such systems should allow managers to update information, serve as a support in conducting the appraisal interview, allow the creation of effective appraisal forms, and support all legal mandates relevant to performance appraisals. In some systems, a copy of the current job description for the position is available to the manager so that it can be reviewed for accuracy on an annual basis. A system supporting multisource feedback appraisals such as **360° appraisals** is described by Meyer (1998).

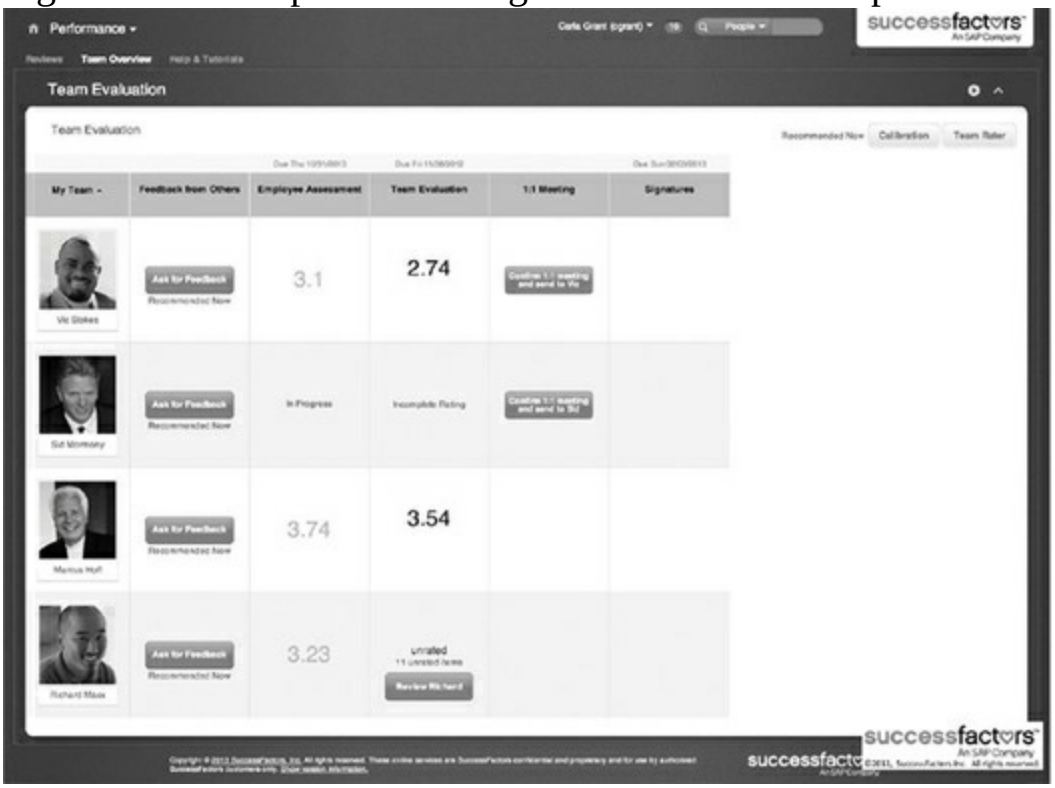
Group performance can also be tracked and the data used for performance improvement; because most employees work as part of teams, there has been increased interest in measuring and managing team performance (e.g., Jones & Schilling, 2000). Stegner and Kofahl (2004) provide a case study of a process for group performance improvement that could not exist without heavy input from the HRIS. In some cases, systems tie closely with marketing and management information systems; Charles, Kurlander, and Savage (2000) describe a sales performance tracking system that keeps home office and sales personnel aware of results against quotas and suggests where efforts need to be made to enhance sales performance.

Finally, automated PM systems allow managers and HR managers to track the administrative aspects of PM: Have all managers completed performance contracts with their direct reports? Are summary appraisals done on time? Do ratings by a manager and the performance of the manager’s unit jibe? These are questions that can be answered by the system. Additionally, performance

ratings can be checked for possible bias against protected groups. This checking can include not only the ratings themselves but also their use in HR decisions. Under the *Uniform Guidelines on Employee Selection Procedures* (U.S. Department of Labor & U.S. Department of Justice, 1978), performance appraisals are considered “tests” when used for HR decisions, such as promotions, and are subject to the same validity and reliability requirements as other tests when they are found to have an adverse impact on protected groups.

Web-based systems can also provide a calibration tool for employee performance ratings that allows for a visual inspection of the distribution of ratings for a population. This calibration is often essential as a tie-in to the compensation process since performance ratings often dictate how much employees may receive for their annual merit review. The example of performance calibration presented in Figure 12.3 is part of a succession planning system being used by a large utility organization, a system that allows managers to view the distribution and even drag-and-drop employees within the ratings to adjust for any discrepancies.

Figure 12.3 Example of Relating Performance to Compensation



Compensation

Overview

Compensation is one of the most complex topics in HRM, and attempting to present an overview is ambitious. The central motivational issue for compensation is whether or not it is seen as equitable or inequitable to employees as defined by Equity Theory. Since compensation is the primary outcome for most employees, a great deal of dissatisfaction could result when it is viewed as unfair. Organizations faced with the complexities of creating and administering compensation systems are increasingly turning to technology for help. Wright (2003, p. 55) estimates that a 12,000-person firm can save as much as $850,000 per year in administrative costs by automating compensation planning alone. Brink and McDonnell (2003) point out that nearly all processes used to design, communicate, and manage pay are moving toward Web applications. In fact, Stone et al. (2015) cite research noting that 50% of organizations are using information technology in developing and administering rewards programs, and they suggest that two major goals are the reduction of administration costs and time.

The basic compensation system includes **base pay**, merit pay, short-term and long-term incentives, perquisites, recognition awards, and attraction or retention awards. There are many processes associated with each of these, all of which must be coordinated. If that were not enough, there are also special populations that have unique pay processes: executives, sales personnel, scientists and engineers, expatriates, unionized workers, and the whole panoply of temporary, contract, and part-time workers.

Base pay is built around two processes: **job evaluation** and market benchmarking. Job evaluation creates an internal hierarchy of value. In the most common form of job evaluation, a set of factors is developed that reflects characteristics that add value to work in the specific organization (e.g., the education required). Each factor is weighted by importance, and scales are developed. Every job that will be in the base pay system is

evaluated on the set of scales, and a point score is calculated. Jobs are arranged by total points, and this forms the basis for a salary structure.

Market benchmarking is used to price the structure (or individual jobs). Market data are collected for as many jobs as possible. In most organizations, one or more surveys may be developed in-house to collect market benchmarks, but the bulk of benchmark data come from commercial and association surveys. Many of these surveys are now available electronically (via a download from a website) and can be integrated into the compensation information system. Entering data can be done through a website with a format that maximizes ease of data entry (Tobin, 2002). However, websites with salary data are not without problems; employees frequently access websites that may have unrepresentative data and argue that they are underpaid based on bad data (Menefee, 2000).

An employee is placed in the salary grade appropriate for her or his job. Each grade has a midpoint that serves as a proxy for all the jobs in that grade, and a range is built around that midpoint. (This range defines the minimum and maximum salary for jobs in that grade, usually ±20% from the midpoint.) Exact placement in the range is usually a function of performance and individual characteristics (quality of degree, job seniority, and experience).

However, because of economic difficulties for the past seven years, some organizations (especially public sector organizations) could not afford to keep up with the market or provide cost-of-living increases, and now, they find themselves dramatically behind salaries paid in other industries. This is especially true for IT jobs, and many organizations are trying desperately to catch up to market levels. The structure is adjusted each year based on market movements. If the market were to increase by 3%, for example, the midpoints would increase by 3% as well. However, not all employees receive a 3% increase if the organization uses a merit pay system. In a merit pay system, the size of the increase is a function of performance level and of where an employee is in the range: the higher the performance, the larger the increase and, generally, the lower the place in the range, the higher the increase. A merit matrix, developed to provide guidelines based on performance and place in the range, ensures that the total amount spent by the organization is no more than the specified percentage of payroll.

There are many forms of short-term **incentive pay**. Unlike merit pay, short-term incentive pay is rarely added to base pay and must be re-earned every year. Typical short-term incentive programs include bonuses, gain sharing, goal sharing, small-group incentives, and profit sharing. Short-term incentive programs usually have specific measures, set up prior to the beginning of the program that will drive payout (profit sharing as an incentive is not typically covered by these measures). Gain sharing, for example, bases payouts on reductions in production costs due to more efficient use of labor. Specific preplanned formulas based on past production costs drive payouts. Bonus systems can be driven by preplanned criteria related to manufacturing, customer service, safety, or anything else that the company wishes to motivate employees to achieve. Profit sharing is usually retrospective, however; the board decides after the books have closed for the fiscal year that some percentage of profits will be shared with employees. In all cases, the measures driving short-term incentive payouts must be collected, either through existing measurement systems or through special systems designed for the purpose.

Long-term incentives are primarily based on organization stock, options to buy organization stock, or phantom (make-believe) stock. The goal of long-term incentives is twofold: to align the interests of employees with those of shareholders and to motivate aligned performance over periods of more than one year.

Perquisites are rewards that are a function of organizational status. Executive dining rooms, first-class or corporate jet air travel, and club memberships are examples. Perquisites frequently have tax consequences to the employee receiving them and, thus, must be included as part of the pay system. In the past several years, some organizations have transformed perquisites into incentive rewards based on performance; go to any Disney property, and you will see parking spaces near the employee entrance that are reserved for high performers.

Recognition awards are low-cost or no-cost awards that are retrospective: when an employee does something of note, he or she receives an award that may have little financial value but is psychologically rewarding. The use of websites in recognition programs, so that every employee can go online and

find where he or she stands in comparison with other eligible employees, can greatly enhance the motivational impact of such programs (Perlmutter, 2002). **Attraction or retention awards** are one-time awards that are used to attract prospective employees to the organization or persuade them to remain with the organization. These awards may take the form of cash, stock options, benefits, or adjustments to benefits rules. The goal is to incur a one-time cost that does not drive up base pay.

Although the types of compensation already described are made up of multiple programs, it is critical that all compensation programs be integrated, so employees receive a single message about what adds value in the organization and the type of behavior and culture that is desired.

Compensation programs must also meet federal and state statutory and regulatory requirements. The **Fair Labor Standards Act (FLSA)** differentiates **exempt workers** and **nonexempt workers**; the organization must pay nonexempt workers at least the minimum wage, must pay for time worked in excess of 40 hours a week at an overtime rate of 1.5 times the normal pay, and must provide records to the federal government on hours worked and regular and overtime pay for all nonexempt workers. Different states and municipalities may have higher minimum wages than the federal level, and a company doing business nationally must keep track of changing rates across the country to make sure they are compliant; the HRIS must be capable of tracking changing worker locations and state and local minimum wages and adjusting payroll accordingly. The **Office of Federal Contract Compliance Programs (OFCCP)** requires annual evidence of no unfair bias with respect to race and gender for similarly situated employee groups and requires multiple linear regression analyses as evidence.

Typical Data Inputs

Compensation data inputs include internal, external, and generated data. Internal data include information about jobs (descriptions, specifications), people (performance, salary history), and organizational units (salary budget, job evaluation system). External data would include market survey data and information on rewards practices. Internal and external data would be combined and used to generate job evaluation results, salary structures, merit

matrices, and a variety of reward guidelines. Incentive programs will require input data on whatever behavior or outcome is being encouraged; such data might include customer survey results, accident data, time-to-market data, or product quality data. Data from the staffing function can highlight problem areas, for example, jobs for which compensation may be too low.

Compensation for a special employee group usually requires data specific to that group. Executive compensation is likely to require organization-wide sales, productivity, profit, share price, market share, and other financial, market, and production data indicative of organizational success. Sales compensation systems may require data on quotas, sales, bonus or commission rates, and competitive market data. Gain-sharing programs require historical averaged data on labor costs as a proportion of value of production. Bargaining unit employee pay systems require data on contract specifics. For nonexempt employees, hourly rates and hours worked per week are required.

In short, there are very few data within the organization that might not be required by some part of the compensation system. As an example, a company that market-prices jobs will collect as much market data on wages as possible. Even so, it is unlikely that market data can be found for all jobs. The “market rate” for these jobs must be estimated. It is common to use multiple linear regressions for this purpose. As much information about all jobs is collected as possible, using either job specification data or aggregate information from job incumbents. Some specific information that might be collected from the HRIS includes the average education level of job incumbents in each job, the average amount of training incumbents in each job have had, the average number of direct reports each incumbent in a job has, and so forth. Although logic guides the choice of which independent variables to use in the regression equation to predict market rates, the goal is to get the best prediction, so whatever variables end up providing the best prediction are the ones that will be used. Similarly, incentive programs may make use of any financial, market, or production data to determine whether bonuses should be paid and, if so, how much and to whom.

Typical Reports

There are a number of standard reports in the compensation arena; however, because of the sensitive nature of compensation information, they are not widely circulated. The most common reports include budget reports to managers showing how their actual compensation costs compare with the projected costs. Most organizations provide each employee with an “Annual Compensation Report” showing the total amount of money spent by the organization on the employee, including money spent on wage or salary, incentive pay, and the cost of benefits paid for by the organization. Similar reports, such as incentive reports that tell people how they are doing with respect to earning a specific incentive award, become much more effective when a website is used for communication (Stiffler, 2001).

Companies participating in wage surveys produce reports for use by surveying organizations. In some cases, a compensation analyst draws the data from the HRIS and enters them into the survey, but, in other cases, an automated application gathers data from the HRIS and enters them into the survey program.

A new report on the analysis of possible “systemic compensation bias” among “similarly situated employee groups” is now required by the U.S. OFCCP. This report will be due annually, along with the organization’s EEO-1 Report.

Data Outflows

The primary data outflow from compensation modules is to payroll. Compensation analysts draw on the data for additional analyses, however. Managers preparing budgets draw on compensation data as they project costs over the next budget period. Benefits analysts draw on compensation data as they analyze probable future costs of wage-based benefits (pensions are usually a function of salary level while health benefits are largely independent of salary level).

Data are sent to federal, state, and local agencies, including taxing agencies, labor departments, and other units tracking wage data. Many organizations also provide data to firms conducting reward surveys.

Decision Support

The major rewards decision that has to be made about every employee is how much to pay that individual to be seen as fair by the employee. Decision support systems in compensation are all aimed at that decision. Because of the complexity of compensation, though, a series of decisions must be made before a final compensation decision is made. Thus, there are decision support systems dealing with job evaluation, the use of market data, market pricing, building a salary structure, developing a merit matrix, and running incentive programs. Although much of this activity is carried out by compensation and other HR managers, other managers can do much of the work themselves if the system is set up correctly as a self-serve system. The most common areas that managers would handle themselves include salary budget planning, merit, promotional and other increases, and most incentive programs. Using Web-based compensation modules, managers can perform salary-planning functions much easier than was possible with paper-based processes. Data such as current salary, compa-ratio, and salary ranges can be viewed for all their employees at once; for international organizations, such systems can handle multicurrency requirements, and these systems can ensure that the total of the projected salary increases recommended by each manager does not exceed budgeting guidelines. Figure 12.4 depicts the work area of a Web-based application that enables managers to do compensation planning for their employees.

Koski (2003) describes a project that automated a worldwide employee bonus system; executives and managers got a self-service system, and compensation executives could keep track (in real time) of award amounts and payouts. Supported by computer and Web-based products, these processes generally offer advantages to the organizations using those (Zingheim & Schuster, 2005). Indeed, Zingheim and Schuster (2004) argue that Web management of pay and rewards is one of two great innovations in the rewards field.

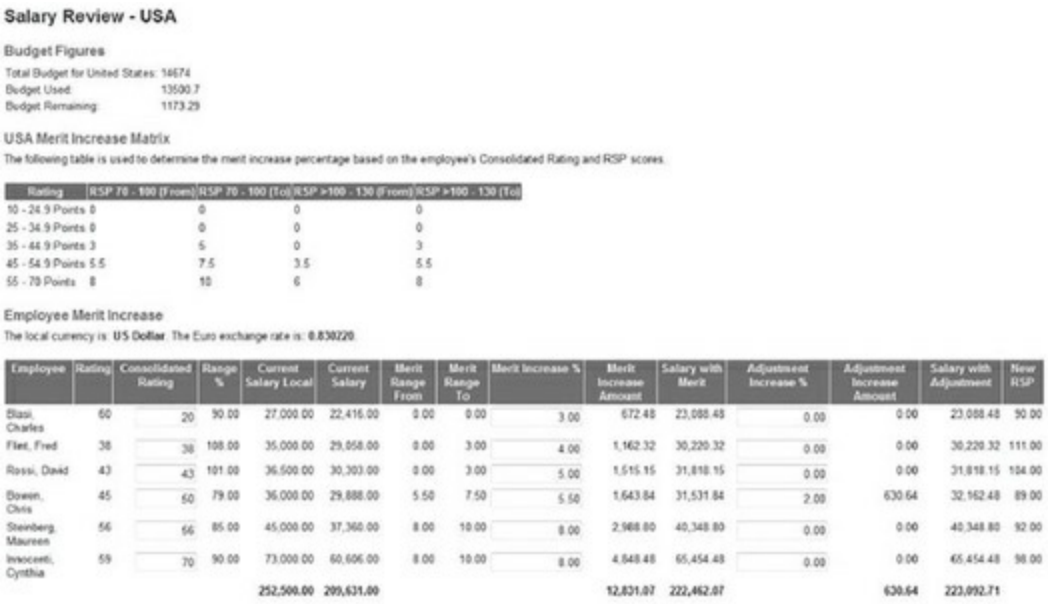
Employees do not make many compensation decisions themselves, so self-service functions are largely restricted to providing information. Most companies now make salary structures available on the company intranet, and job postings typically provide either structure information or the salary grade of a job, so employees can look up what the range of pay for any job would

be. The merit matrix, average salary increases, average bonuses of various kinds, and other reward information are all posted by some companies. Most public sector salaries are publicly available under state and local “freedom of information” acts, and, in these cases, salaries (and total earnings) of specific employees are available; private organizations almost never post such information.

There can be difficulties with Web management of pay. Van De Voort and McDonnell (2003) point out that working “live” can create problems when numbers change during the process. As an example, if a manager is calculating merit pay and is working off a specific budget number, changes to that number by a senior manager can create confusion and bad decisions. The use of a frozen or static database ensures that everyone is working with the same data, formulae, and figures.

Other decision support systems deal with sales compensation. Cocks and Gould (2001) note that compensation software is critical in defining commission levels, designing compensation plans, and managing compensation, since all three areas require on-the-fly complex calculations on a repeated basis. Weeks (2000) notes that virtual sales teams in widely separated areas can be much more effective in maintaining customer satisfaction; only the Web allows the coordination between team members required to pull off this strategy, and it also allows sales compensation experts to audit and fine-tune the sales compensation system to maintain high motivation levels.

Figure 12.4 Screen of Salary Review Module for Department Manager



Salary Review - USA

Budget Figures

Total Budget for United States: 14674
Budget Used: 13500.7
Budget Remaining: 1173.29

USA Merit Increase Matrix

The following table is used to determine the merit increase percentage based on the employee's Consolidated Rating and RSP scores.

Rating	RSP 70 - 100 (From)	RSP 70 - 100 (To)	RSP >100 - 130 (From)	RSP >100 - 130 (To)
10 - 24.9 Points	0	0	0	0
25 - 34.9 Points	0	0	0	0
35 - 44.9 Points	3	5	0	3
45 - 54.9 Points	5.5	7.5	3.5	5.5
55 - 70 Points	8	10	6	8

Employee Merit Increase

The local currency is: **US Dollar**. The Euro exchange rate is: **0.830220**.

Employee	Rating	Consolidated Rating	Range %	Current Salary Local	Current Salary	Merit Range From	Merit Range To	Merit Increase %	Merit Increase Amount	Salary with Merit	Adjustment Increase %	Adjustment Increase Amount	Salary with Adjustment	New RSP
Blasi, Charles	60	20	90.00	27,000.00	22,416.00	0.00	0.00	3.00	672.48	23,088.48	0.00	0.00	23,088.48	90.00
Flint, Fred	38	38	108.00	35,000.00	29,058.00	0.00	3.00	4.00	1,162.32	30,220.32	0.00	0.00	30,220.32	111.00
Rossi, David	43	43	101.00	36,500.00	30,303.00	0.00	3.00	5.00	1,515.15	31,818.15	0.00	0.00	31,818.15	104.00
Bowen, Chris	45	60	79.00	36,000.00	29,888.00	5.50	7.50	5.50	1,643.84	31,531.84	2.00	630.64	32,162.48	89.00
Steinberg, Maureen	56	56	85.00	45,000.00	37,360.00	8.00	10.00	8.00	2,988.80	40,348.80	0.00	0.00	40,348.80	92.00
Innocenti, Cynthia	59	70	90.00	73,000.00	60,606.00	8.00	10.00	8.00	4,848.48	65,454.48	0.00	0.00	65,454.48	98.00
				252,500.00	209,631.00				12,831.07	222,462.07		630.64	223,092.71	

A whole set of applications relate to executive pay. Since the Enron scandal and the subsequent passage of the **Sarbanes-Oxley Act (SOX)**, compliance reports, including those dealing with executive pay, are required. SOX compliance is greatly supported by data from the HRIS ("How HRIS Can Help with SOX Compliance," 2005; Sherman, 2005). Additional regulations covering executive pay have come about as a result of the **Troubled Asset Relief Program (TARP)** of 2009 and the financial bailout of troubled financial services firms and automakers. More financial regulations restricting executive pay in financial firms were enacted in the **Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010**, and regulators continue to press for new controls. The HRIS must be flexible enough to add any new fields required by these regulations and capable of running the audits required.

Benefits

Overview

A full discussion of benefits programs is beyond the scope of this chapter. There are five broad types of benefits programs in most U.S. organizations. Because some company-provided benefits in this country are government provided in other countries, a different typology would be required for

organizations abroad. As might be expected by Equity Theory, benefits are becoming important outcomes from the organization and could affect employee turnover.

The first set of benefits programs common in U.S. companies includes **pension plans** (both defined benefit and defined contribution), individual savings plans (such as Keoghs), **simplified employee pensions (SEPs)**, **individual retirement accounts (IRAs)**, and Social Security). Although few Americans think of Social Security as a benefit, the organization must fund contributions to Social Security just as an employee does. The goal of all these benefits programs is to ensure that the employee will have continuing income after retirement. The second set of benefits programs includes workers' compensation, unemployment insurance, long- and short-term disability insurance, and life insurance. The goal of these programs is to ensure that employees who cannot work (through no fault of their own) have some income until they can work again and to provide income protection to employees' families.

The third set of benefits programs includes medical and other health benefits, such as hospitalization and medical care insurance; surgical and major medical care insurance; long-term care; dental, vision, and hearing care insurance; and prescription drug coverage insurance. These benefits are designed to make sure that employees and their families are not bankrupted by illness or accident and can obtain preventative and curative care. The fourth area of benefits is paid time off and includes vacation, holidays, personal days, special purpose days (because of jury duty, bereavement, or military service, for example), and family leave. The purpose of paid time off is to allow employees to recharge their batteries, spend time with their families for celebrations, and participate in other significant life events.

The fifth and final category of benefits includes miscellaneous benefits such as dependent care, flexible working benefits (telecommuting, job sharing, and compressed workweek), employee assistance programs, professional memberships, tuition reimbursement, holiday parties and gifts, subsidized cafeterias and gyms, legal advice benefits, and employee discounts. These benefits round out the benefits package and are typical of organizations found in the "best companies to work for" lists.

Benefits programs differ from compensation in two major ways. First, in the majority of organizations, employees pay part (or all) of the costs for most benefits. (Even when benefit costs are borne entirely by employees, group purchasing reduces the cost that the employee would pay for an equivalent self-purchased benefit.) Second, most organizations offer some flexibility in their benefits programs. All employees receive a core benefits package but then choose additional coverage or additional benefits, or both, up to the level of the total benefits package. (Flex plans also allow the employee to purchase additional coverage or benefits, or both, at cost.) These two characteristics of benefits programs make them relatively complex to administer; each employee in the organization may have a slightly different benefits package with a unique salary deduction profile. Things even get complicated with paid time off. Not only may different employee groups (e.g., bargaining units, executives) have different configurations for paid time off, but these configurations may also differ within groups based on seniority. In addition, many organizations have what is called a paid time off bank, through which employees can trade paid time off for cash or other benefits, can buy additional paid time off, or can donate paid time off to other employees (e.g., in cases of long-term illness). All this makes benefits programs extremely complex and difficult to administer.

Another major difference between benefits and compensation programs, one that strongly affects HRIS configuration, is the growing trend to outsource benefits programs and administration. Few parts of the typical compensation program are outsourced. The most common is the outsourcing of wage benchmarking. Although consultants are frequently used in compensation, they tend to work offline. In benefits, however, program design, benefit delivery, and program administration (including employee communications) are increasingly outsourced. As a result, the HRIS must interface not only with other internal systems, such as rewards and payroll, but also with the IT systems of other organizations. The necessity of establishing these interorganizational linkages introduces problems such as how to define fields, which fields can be included, what protocols for interaction to establish, and how to maintain security.

Legal requirements for benefits programs are also more stringent than those for compensation programs. Most benefits programs are influenced by the

Employee Retirement Income Security Act (ERISA), which grants benefits a tax-favored status. However, to qualify for favorable tax treatment, the benefit must meet stringent requirements. These include reporting to recipients of benefits and to the federal government, demonstrating that requirements for qualified status are met. In addition, many organizations offer nonqualified benefits to some employee groups, particularly to executives.

Aside from legal requirements, most organizations (and their employees) are concerned about the safety and security of personal data stored in the HRIS (Zafar, 2013). Data required for benefits include many characteristics of employees that they wish to keep private (e.g., addiction treatment, psychiatric care, adoption records, and health information). Because benefits information is shared with organizations outside the employer (e.g., insurers, medical providers), data security can be breached, not only in the employing organization but also in other organizations. More information on how organizations can protect their employees' privacy and secure data is provided in Chapter 15.

Typical Data Inputs

There are HRIS benefits modules with different purposes, and each requires a different type of data input. One set of functions focuses on the organization's relationship with current and prospective benefits vendors (of health insurance, for example). Inputs, in this case, will include aggregate data about the people to be covered, data outlining the relevant demographics for the covered groups, and data specifying the program coverage desired and cost limitations.

A second set of functions focuses on the internal management of benefits programs and will be used to track usage, employee choices (in the case of flex plans), and costs. Experience, usage, and costs will be fed into this program.

A third (and the most common) set of programs focuses on employee input about enrollment and other coverage choices, changes in coverage desired, and changes in employee status (e.g., addition of a dependent, change in

marital status) that may affect coverage and employee costs. These programs may also allow employees to file claims with the organization. In these programs, many of which are Web based, employees feed in personal data, coverage choices, and other data relevant to their use of the benefit.

The fourth set of data placed into the system consists of the myriad federal, state, and local laws and regulations governing benefits practice. These laws and regulations provide decision support system rules for managers using the system.

Typical Reports

There are dozens of reports required by federal and state government units, including the IRS, units of the U.S. Department of Labor, other federal agencies, and similar units at the state level. The most common report is the annual benefits report to employees required for tax-qualified plans under ERISA. This regulation requires organizations to report to employees annually about certain benefit facts, such as vested pension levels. Most organizations have gone beyond the ERISA requirements and provide a report to each employee showing the total value of all compensation and benefits received by the employee during the year. This annual compensation report is the "rewards scorecard" for the employee. Ceccon (2004) estimates that putting this annual report online rather than distributing printed copies can save a company with 30,000 employees $678,000 in actual costs over five years and that productivity savings from reducing the amount of time employees use to find benefit account balances, pay information, and other rewards information on multiple sites or via phone calls to the HR department can save $625,000 per year. HR productivity increases net an annual savings of $30,000, and increased employee retention would reduce costs by $150,000 per year. With a five-year savings of $678,000 and an annual productivity savings totaling $805,000, Web reporting is clearly advantageous.

With Web-based access to benefits and other employee information, staff can view summary reports at any time, which, in many cases, eliminates the need for a company to produce expensive paper versions. With a Web-based system, an employee can, at his or her convenience, view his or her current

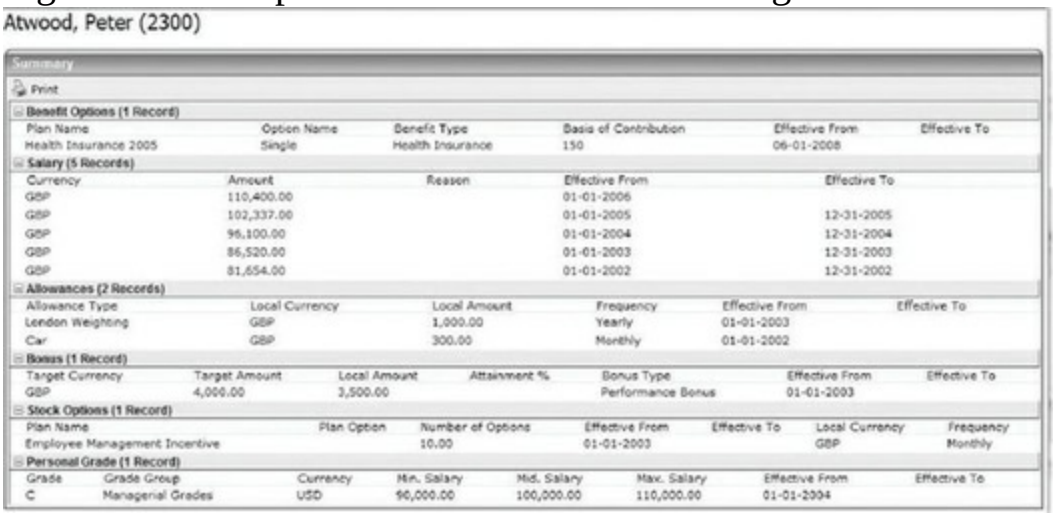
benefits, salary, and other information directly (as shown in Figure 12.5) and decide to print a paper copy if one is needed. For an international company that distributes benefits or pay in multiple currencies, the system could normalize that data into a single currency.

Data Outflows

Data generated by benefits programs have to be transferred to payroll and accounting internally. Data are sent externally to benefits providers, outsourced benefits administrators, and a variety of federal, state, and local agencies. Aggregate data are provided to benefits survey firms.

The real-time transfer of data can result in large cost savings. Moynihan (2000) notes that AT&T saved $15 million when it switched to providing updated enrollment information to all its various health plans. Previously, tardy data transfer resulted in health plans denying coverage to employees who were in fact eligible and in claims being paid out to people who no longer worked for AT&T.

Figure 12.5 Compensation and Benefits Planning Screen



Decision Support

Decision support tools overlap to some extent with reports in the benefits arena because, frequently, these reports trigger the need to make changes to

comply with federal, state, or local requirements. As an example, McCormack (2004) notes that the Family and Medical Leave Act (FMLA) has complicated the administration of employee leave. Many states have more stringent leave requirements than FMLA or the 40 other federal leave laws. A system that tracks these laws and can tell the HR manager exactly what the leave requirements are in a specific locality ensures compliance and minimizes the risk of lawsuits and fines.

Similarly, tax-qualified benefit plans are subject to federal bias regulations. In this case, "bias" refers to income level rather than protected group status. Federal policy is that tax laws should not underwrite benefits that are available only to highly paid employees. If an organization is to have a qualified 401(k) retirement plan, for example, the plan must be available to both low- and high-paid employees, and, in addition, it must be used by both. Tracking enrollments against those eligible for participation can trigger efforts to get more low-paid employees to participate in the plan.

When organizations offer flexible benefit plans, it is common to track the choices made by employees to guide plan development. A few organizations have looked at benefits choices made by high performers to see if they differ from the choices made by low performers. Others look at the choices made by protected groups. Recruitment literature can then be tailored to specific groups to ensure a better yield of desirable applicants.

Web-based services also offer decision support to employees deciding what levels of coverage to sign up for (Dawson, 1997). Employees can readily compare the cost of various levels of benefits service and more readily understand the cost-benefit trade-off that they are going to make. Similarly, transferring the enrollment process to the employees themselves can save the organization money (Teer, 1997). However, such savings are not likely to occur unless the system is easy to use for all employees, not just the technologically savvy (Ashley, 2006).

Self-service systems for managerial use in the benefits area are not frequent, as few managers have a role in benefits decisions concerning their direct reports. However, self-service systems for employees are increasingly relied on by employers to lessen the burden of benefits transactional administration (Stone et al., 2015). Employees typically make and change selections in

flexible benefits plans through the company intranet. They can change beneficiaries or dependents as births, deaths, and divorces occur. They can increase tax-deferred or pretax contributions to various benefits categories such as 401(k) plans, health spending accounts, and similar programs. They may buy or sell vacation days from the paid time off (PTO) bank. They may transfer PTO days into their 401(k). (There are timing and contribution limits and other rules that must be observed, but these can be built into the application.) Employees can also find out the status of various benefits through self-service approaches. At least one organization allows employees to do "what-if" scenarios with respect to retirement: for example, "If I retired tomorrow, what would my pension be?"

The outsourcing of benefits creates additional issues for the HRIS. Some major corporations have outsourced all benefits. An extensive interface must be built connecting the organization's HRIS with the outsource firm's system. The benefits advisers at the outsource firm must have current, accurate data on the benefits status of every organizational employee to be able to answer questions and provide advice. Outside access raises security issues to a greater level of concern; benefits data (including hospital and other medical billing and psychiatric care and employee assistance program billing) are the most sensitive employee data held by the organization, and privacy standards (including Health Insurance Portability and Accountability Act [HIPAA] requirements) must be met.

A whole range of decisions concerning benefits is made outside the HR department. Benefits costs are the most rapidly increasing part of labor costs, particularly costs for health care benefits and defined benefit pension plans. Consequently, senior executives (especially the CFO) are interested in the aggregate costs of the various benefits packages offered by the organization. However, determining these costs is complicated. For many benefits, such as workers' compensation, cost is a function of experience; for others, such as insurance, cost depends on usage; and for others, such as health insurance and pensions, employee demographics are particularly significant. Therefore, the organization needs to be able to price current benefits packages and project costs based on expected demographic changes. It also needs to be able to run "what-if" scenarios based on alternate benefit packages: What would we save over the next five years if we switched from a defined benefit

pension to a cash balance plan? How would that compare to switching to a 401(k) with match?

Payroll

Overview

Payroll is the transactional process through which compensation is transferred to employees and federal, state, and local income and payroll taxes are withheld from employees' checks. It is also through payroll that any benefits costs borne by employees are withheld. Although some employees receive actual checks for net pay, it is more common, especially among large organizations, for direct deposits to be made to employees' bank accounts. Companies that outsource need to make sure that the compensation and benefits modules of the HRIS interface flawlessly with the provider's payroll input. Even when companies do payroll in-house, the payroll module is usually part of the accounting system rather than the HRIS, so it is critical that the interface between the HRIS and the payroll software work flawlessly (Walker, 1987).

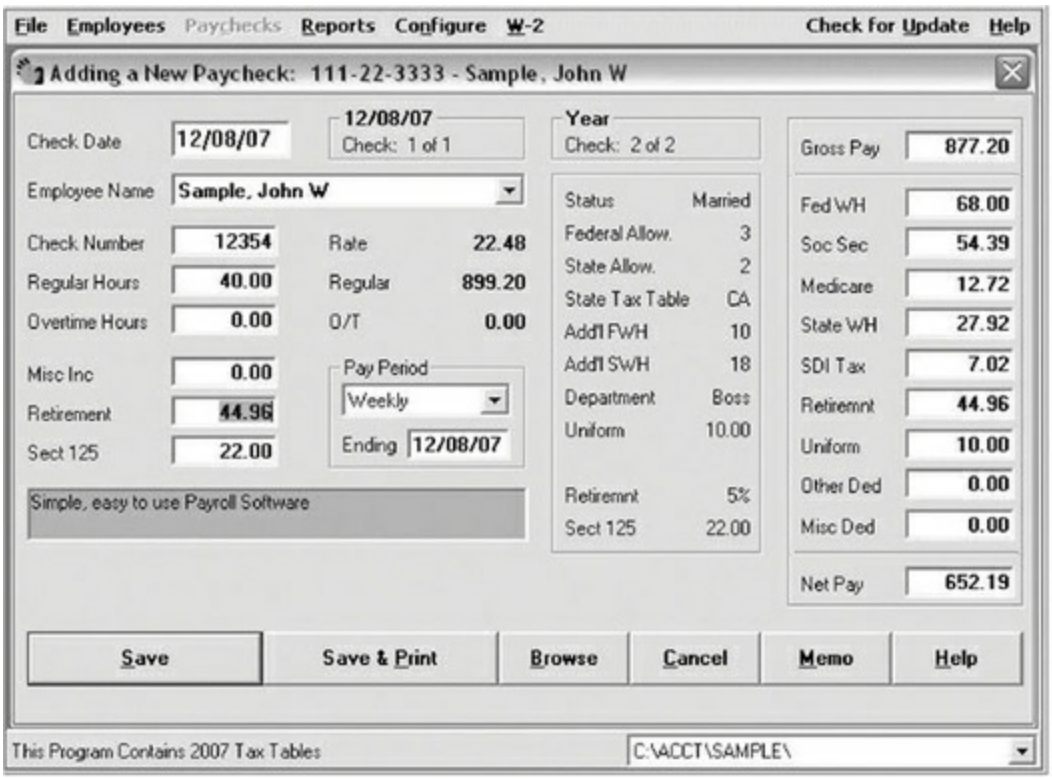
In the majority of organizations, payroll is a function administered by finance or accounting rather than the HR department. HR departments feed compensation data and benefits coverage (and employees' coverage choices) to payroll, which makes sure that all appropriate federal, state, and local income and payroll taxes are withheld at the correct rate and that any deductions for benefits are also withheld at the correct rate. Payroll usually has the responsibility for keeping track of income and payroll tax rates and applicable salary levels. Payroll results are fed back into the general accounting system by payroll. Because labor costs are the largest variable cost for most organizations, it is critical for the organizations' financial well-being that payroll records be accurate and timely. Because the paycheck is a signal of the employment relationship and because many employees rely on their paychecks to meet bills that are due, it is critical that the payroll system deliver accurate and timely paychecks or bank transfers. Little will anger or demoralize an employee more than a missing or an inaccurate paycheck or transfer. In short, payroll is a transactional task that must be flawless.

Payroll is the most heavily outsourced HRM function. Great economies of scale can be achieved by a payroll processor with respect to keeping up with the intricate requirements of income and payroll tax deductibles or maintaining (and upgrading) software that ensures that payroll is accurate and completed in a timely manner. However, outsourcing companies do not work in a vacuum, and compensation and benefits functions must deliver data to the outsourcer, and the accounting and finance functions must receive data back from the outsourcer. Also, some companies argue that integrating the HR and payroll functions makes sense and saves data entry and labor costs while providing greater accuracy and timeliness (Gale, 2002).

Typical Data Inputs

Data entered into the payroll system from inside the organization include compensation data, benefits data, and other payroll addition data (e.g., special awards) and deductions data (e.g., union dues, wage garnishments for child support, credit union repayment installments). Time and attendance data are usually handled in a special module, and data from this module are also fed into payroll (Robb, 2004). Data external to the organization include federal, state, and local income and payroll tax rules that allow the organization to withhold appropriate amounts from each employee's paycheck. There may be payments made to individuals who are not active employees. Although these are usually taken care of in a separate COBRA module, there may even be payments from ex-employees for the continuation of benefits. The most frequent data input are change data. Every time a new employee goes on the payroll, an employee changes status, an employee makes benefits elections changes, governments change tax or withholding rates, or the organization makes changes such as pay increases, data reflecting the changes have to go into the payroll system. Many of these elections can be performed by employees themselves using the self-service capability of a Web-based payroll system. Through a direct entry screen (shown in Figure 12.6), the employee can enter or update any data that he or she controls, such as the number of exemptions or extra withholding, without the need for HR intervention. For an international company, the system could automatically present any financial data in whatever currency the employee requested.

Figure 12.6 Screen Used for Entering Data for a Paycheck



In addition to internal and external data, the system generates data that it stores and uses over time. For example, in 2016, FICA (**Federal Insurance Contributions Act,** i.e., Social Security) taxes were withheld on the first $118,500 of income and the maximum tax withheld for any employee was $7,347. Payroll must keep a running total of FICA paid to date so that it does not deduct too much from the employee's paycheck.

Typical Reports

There are a number of standard payroll reports. These show—for the organization as a whole (or for subunits)—the actual amount paid to employees for a period (and cumulatively) and the amounts deducted for various purposes. Reports go to federal, state, and local agencies, including taxing authorities, and to benefits providers. Employees receive reports with their paychecks or notices of deposit; the report shows gross pay and all deductions. Usually year-to-date accumulations are also provided.

Data Outflows

Payroll data go to accounting; federal, state, and local agencies; benefits outsourcing firms; and individual benefit program providers. These payroll data are the input for a variety of processes in those units, so it is critical that systems interface flawlessly. Interface becomes even more complicated as external systems communicate not only with payroll but also with compensation, benefits, and other HR systems.

Decision Support

Payroll data are not usually used by HR departments or line managers for decision-making purposes. They are used extensively for audit purposes. Employees, on the other hand, like to know from time to time how much money they have earned in a given year, how much income and payroll taxes have been paid, and the level of pretax and deferred tax contributions made for various benefits. This information can be made available through a self-service system. Similarly, a self-service system can allow employees to increase withholding or make other (limited) changes in their pay.

Summary

The overall goal of this chapter was to provide the reader with a broad understanding of the role and focus of HRIS in supporting performance management, compensation, benefits, and payroll processes. The combined PM, compensation, benefits, and payroll systems constitute some of the most important parts of the HRIS. Money may not be at the forefront of how people talk about the organization and their linkages to it, but, if performance ratings result in lower than expected salary increases, bonuses are miscalculated, benefits elections are not implemented, or a paycheck is wrong or (worse still) not delivered, employees become vocal. Because pay and benefits constitute the largest variable cost to any organization and the largest overall cost for many organizations, it is critical that managers plan, track, and audit outlays on a real-time basis. A significant proportion of the data and reports owed to federal, state, and local agencies come from the compensation, benefits, and payroll modules. The consequences of inaccurate, misleading, or missing data and reports include embarrassment, fines, and even jail time. And these are the risks associated with poor data from just the transactional part of these modules. The additional fallout

would be the negative effects on the motivation of the employees to work at higher levels and/or to leave the company for a company that does not have these problems. Thus, one of the major purposes of an HRIS is to help organizations administer their performance management, compensation, benefits, and payroll systems.

The role of motivation in work performance was covered, with a specific discussion of Equity Theory. It is easy to see that employees who perceive their job situation in terms of the ratio of their inputs to the company's outputs as inequitable will not be highly motivated to perform adequately on their jobs. A key part of strategic HR is aligning employee behaviors with the strategic intent of the organization. As seen in the discussion of goal-setting theory, the process of the PM system needs to follow the research findings on goal setting. It is important to hire the best people and provide them with the training and development needed. Without PM, the success of hiring strategies is unknown, and, similarly, the need for training and development interventions is unknown. PM systems support the translation of corporate strategy into individual performance plans. Compensation and benefits systems can be used to hire the right people, retain the high performers, and motivate all employees to perform at a higher level. Compensation can also be used to motivate poor performers out of the organization. As systems technology has progressed, managers have become better able to enhance the performance of their direct reports and to tailor compensation and benefits programs to attract, retain, and motivate the best. Thus, the importance of understanding the central role of an HRIS in assisting managers in making key decisions regarding performance, compensation, benefits, and payroll cannot be underestimated.

Key Terms

360° appraisals 337
attraction or retention awards 340
base pay 339
Consolidated Omnibus Budget Reduction Act (COBRA) 329
corrective feedback 330
direct report 332
Dodd-Frank Wall Street Reform and Consumer Protection Act of

Discussion Questions

1. Discuss how a manager might make sure that the performance plan for each of her direct reports was driven by organizational strategy and the business plan. How can information systems support this goal?
2. Merit increases require a single “performance” number, while most incentive plans have multiple and varying performance measures. How can the PM system meet both needs?
3. Compensation strategy includes how competitive the organization wants to be, the number of different compensation systems the organization wants to have, the mix of various reward and benefit components, and

the basis of increases. Discuss the data inflows required if an organization wanted to automate its compensation design and administration processes.

4. Both PM and benefits information systems make provisions for employee access and input. What access would you provide in each of these systems, and what leeway would you provide employees in reading, entering, and changing data?
5. A lot of compensation information is available to employees today on the Web (e.g., www.salary.com), and much of it is inaccurate. How can an organization assure employees that they are fairly compensated (assume they are) when public data suggest otherwise?
6. Flexible benefit plans are common today. Discuss ways in which employers can ensure that employees make good choices about the benefits and benefit levels that they choose within the benefits information system itself.
7. Payroll and benefits are commonly outsourced. Discuss which parts of PM, compensation, benefits, and payroll you would consider outsourcing; justifying your views.

Case Study: Grandview Global Financial Services, Inc.

Grandview Global Financial Services is an international corporation providing multiple financial services. Although it is one of the smaller players in the field, the firm has about 20,000 employees worldwide. Corporate strategy has focused on serving a niche market comprised of high net worth individuals, providing them with all the wealth management services they require. These services include investments, insurance, banking, real estate, financial planning, and related services.

The linchpin making all these services work well is the quality of the employees—the degree to which they are motivated to provide “over-the-top” attention to clients’ needs. Clients have come to expect this level of service regardless of where they might happen to be and regardless of the time. Because of clients’ high expectations, every employee is expected to provide flawless service.

As it has expanded globally, Grandview has hired employees from all the countries in which it does business. Although all employees are expected to speak English, business is conducted in nine different languages in 45 locations. Grandview has invested heavily in developing a uniform corporate culture but has not succeeded in doing so in all locations.

One difficulty has been the PM and reward systems. Each geographic area developed its own PM tools, which reflect the national culture and the past experiences of local employees. There are a variety of systems using different performance criteria. Most of the PM materials are in Microsoft Word. Some of the systems seem to work all right, although others do not. None of the systems are coordinated, except to the extent those final performance ratings are sent to the Grandview corporate HR department. There has been enormous push back and noncompliance with PM policies from the employees because of the difficulty of the paper performance process as well as the nine different languages being used worldwide.

Rewards systems are similarly localized. Base pay, incentive systems, and benefits have grown up in each geographic location in accord with local market practices, laws, and customs. The complexity and number of Excel spreadsheets needed to manage the financial targets and the resulting compensation plans for that many employees have created perceived and actual inequities. It is difficult to transfer employees across geographic areas because of the different systems in place, and awareness that employees in different locations have very different terms and conditions has created morale problems.

Corporate HR has PM and rewards modules in its HRIS covering U.S. employees, but this takes care of only about 60% of Grandview's employee population. An executive rewards module does cover about 2,000 senior executives worldwide, but all foreign data are sent from different locations and entered into the module at headquarters. Part of the historic reason for this process involves the legal requirements concerning privacy of information in the EU and some other locales; it is easier to get executives to grant permission for the transmission of specific data when those data are used to calculate stock option awards and other executive incentive payments granted by the corporation.

Corporate HR would like to move away from local systems and institute a corporate-wide system that relies neither on Word documents for performance reviews nor on Excel spreadsheets for the resulting compensation plans that result from the overall performance ratings. It was thought that common systems for PM and rewards would support a more unified culture and help translate Grandview's corporate strategy into individual performance plans worldwide.

The ideal system would be a Web-based, multilingual, integrated PM and compensation system. The PM system would be accessible by managers and their direct reports and would be tied to corporate strategy and the current business plan. Managers and their direct reports could access the system at any time to see performance criteria, measures, and standards and to look at current progress against standards. The rewards and benefits modules, although based on local law and customs, would be standardized with respect to process, fostering a more uniform rewards culture. It is critical to HR managers that the technology selected is flexible enough so that yearly changes to the application could be made efficiently and legal requirements in different locations could be accommodated, as well as changes in those requirements.

Because the performance goals are based on financial targets, and employees' merit and incentive payments are directly related to employee performance as well as Grandview's overall results, all necessary functionality for the compensation process should be built into the performance system. At year end, results should be able to be imported directly from corporate financial systems and used to generate performance reviews and compensation plans for the employees. The resultant pay increases and bonus payments would be fed directly into the payroll system already in use by Grandview in the United States and abroad. The system administrators should be able to ensure worldwide compliance with the performance process directly from the system through a variety of reports.

Case Study Questions

1. What is the role of PM in establishing and maintaining corporate culture?

2. What is the role of compensation and benefits in establishing and maintaining corporate culture?
3. Since laws, labor markets, and customs relevant to PM, compensation, and benefits differ from country to country, does it make sense to try to maintain a common global process for managing each of these areas?
4. Given all the cross-country differences, why would a global organization want to have a common HRIS?
5. How should Grandview go about implementing a global PM system?
6. How should Grandview go about implementing a global rewards system?
7. How should Grandview go about implementing a global benefits system?
8. How should Grandview go about implementing a global HRIS to manage these functions?

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Part IV Advanced HRIS Application and Future Trends

13 HRIS and International HRM

Michael J. Kavanagh

Miguel R. Olivas-Luján

John W. Michel

Editors' Note

Today, most organizations of any scope have some form of international presence. For organizations, "going global" is a necessary part of competing, but it can bring with it some of the most important issues for HRM. Frequent conflicts can arise when there is a difference between the culture of the country and the culture of both the organization's and HR's environments. The cultural differences between countries will influence HR programs and practices. In this chapter, some of the significant differences between **domestic HRM** and **international human resource management (IHRM)** in **multinational enterprises (MNEs)** are covered. In addition, the authors discuss some of the key HRM issues involved in an international organization. Further, global operations pose a number of additional complexities and challenges for data collection, management, and use, as well as for the design, development, implementation, and use of an HRIS. These challenges are discussed by the authors throughout the chapter.

Chapter Objectives

After completing this chapter, you should be able to

- Understand the differences between domestic HRM and international HRM
- Identify the types of organizational forms used by firms competing internationally
- Understand the different types of employees who work in MNEs
- Discuss the staffing process for individuals working in MNEs
- Understand the problems that handling expatriates poses for the IHRM department
- Describe the training needs of and programs for international assignees
- Reconcile the difficulties of home-country and host-country performance appraisals
- Identify the characteristics of a competitive international compensation plan
- Understand the modifications necessary for using HRIS applications in an IHRM

HRIS In Action

Skylor Electronics,[1] an MNE with headquarters in Seattle, Washington, learned that the European Union (EU) and the U.S. Department of Commerce had just published a Privacy Shield Framework (PSF) to enable data transfers between subsidiaries under EU information protection laws. The vice president for HR, Rosa Martins, became concerned about the costs of internalizing its implementation. An alternative was to hire a vendor, which might offer some advantages, but at a price.

[1] The company and individual names used are fictitious.

Rosa was looking for the best answer to this problem; she called a meeting with Director of Overseas Operations Elaine Peterson and Director of Career Development Bill Seamon. Bill was quite happy about the new developments, as the previous arrangement, the U.S.–EU Safe Harbor

Framework, had shown a number of shortcomings. Elaine did not understand why there was a problem since she, along with Director of Domestic Operations Dawn Fisher, had successfully managed the automation of a human resource information system (HRIS) for Skylor in a couple of countries, but none of them had the complexity that complying with EU regulations would surely have.

Rosa indicated that she had spoken directly to a few fellow VPs of HR at a local Society for Human Resource Management (SHRM) meeting, and some of them were very uncomfortable with many of the nuances of the new PSF. Rosa directed Bill and Dawn to investigate this problem and to provide a report in two weeks. Elaine indicated that she would provide a member of her staff to help with this investigation.

Two weeks later, Bill and Dawn presented their report to Rosa and Elaine. The gist of the report was that they could not make a strong case for one of the two scenarios (hiring an external consultant or joining the PSF without external help). There were pros and cons for each scenario, but their analysis did not seem to identify that one was clearly more advantageous than the other for a company with annual revenues of about $600 million, like Skylor. Bill and Dawn suggested that, rather than a cost consideration, this would be a managerial preference. When Rosa mentioned that other companies in the area were seriously considering hiring a vendor, Bill and Dawn showed their cost-benefit analysis (CBA), as described in Chapter 7, in which the costs saved by hiring a vendor minimally exceeded the apparent costs of asking current employees to take care of this matter.

Introduction

> *Globalization has changed us into a company that searchers the world, not just to sell or to source, but to find intellectual capital—the world's best talents and greatest ideas.*
>
> —Jack Welch

As noted in Chapter 1, the **globalization of business** is one of the major changes in the world of work. Data from the World Trade Organization (2015) show that merchandise exports around the world have almost quadrupled, from $5,168 billion in 1995 to $19,002 billion in 2014. With respect to commercial services, growth has also gone from $1,179 billion in 1995 to $4,872 billion in 2014. Even though the great recession of 2008 slowed down world trade, the past 20 years show that companies that remain domestic in their geographic scope have a lot to lose. In simple terms, the world's GDP (gross domestic product) is estimated to have reached US$74.152 trillion in 2015; even though the United States, the largest national economy exceeded US$18.036 trillion in the same year, more than 75% of the world's economic activity takes place elsewhere (World Bank, 2016).

Further illustrating the growing importance for HRM, the strategic implications of globalization for chief human resources management officers is the topic of recent reports from the Conference Board (Ark, Ozyildirim, & Levanon, 2015). These reports, which deal with HR's role in mergers, acquisitions, and divestitures, with labor market trends, and with the pressures felt for HR transformation (among other themes), offer evidence that globalization is strongly affecting the HRM field.

Perhaps one of the major changes in the world's business economy has been the formation of regional free-trade zones. The passage of the North American Free Trade Agreement (NAFTA*)* in 1994 established the world's largest free market, increasing trade between the United States, Mexico, and Canada, even if the election of its outspoken critic, Donald Trump, as the 45th president of the United States, suggests that changes are imminent. Subsequently, the European Union was formed and now includes more than 25 member countries engaged in free trade; this membership has kept growing, despite the UK's "Brexit" vote in mid-2016. Other trade agreements, such as the Association of Southeast Asian Nations (ASEAN), the East Asia Economic Caucus (EAEC), the Asia-Pacific Economic Cooperation (APEC), and the South Asian Association for Regional Cooperation (SAARC), have improved trading relationships in Asia. One can easily foresee that there might be an African, and perhaps a Middle Eastern, free-trade zone in the future. Even the United States pulling out of the

“Trans-Pacific Partnership” or “Trans-Pacific Partnership Agreement” will likely bring about another country coalition that will be ratified in the near future.

There are a variety of factors that have led to the increased globalization of business and the increased importance of the IHRM function in organizations. These factors include the following: (1) a dramatic increase in global competition; (2) deregulation in the United States, Germany, and other industrialized countries, which has liberalized the domestic business environment and encouraged transnational investments; (3) an increase in international mergers and acquisitions; and (4) an increased awareness of the existence of talented human capital throughout the world. IHRM requires managing human resources worldwide, or, at a minimum, in more than one country.

One of the major factors related to a firm’s choosing to have an international presence is the availability and cost-effectiveness of information and communications technology. Information and communication technologies have had a major influence on the acquisition and use of physical and financial resources, as well as greatly enhancing the marketing capabilities of MNEs. However, a most important impact of computer technology has been in HRM. Improved communications, worldwide recruiting and selecting, and better talent and performance management programs tied to career planning are only a few of the HR programs in MNEs that have been improved by the use of computer technology. Still, the increased use and integration of data within the organization faces several challenges and pressures because the laws with which these systems must comply often differ from country to country. In this chapter, we examine the characteristics of MNEs and the management of people within these enterprises. In addition, we cover the various ways in which computer technology and a well-developed HRIS affect the field of International HRM.[2]

[2] This chapter cannot cover all the literature and issues in the field of IHRM. However, for the interested reader, there are excellent and comprehensive textbooks available on IHRM (Briscoe & Schuler, 2004; Dowling, Festing, & Engle, 2013; Harzing & Pinnington, 2014; Özbilgin, Groutsis, & Harvey, 2014).

Types of International Business Operations

In today's global economy, organizations tend to compete based on different levels of participation in international markets (Noe, Hollenbeck, Gerhart, & Wright, 2017). International business operations differ primarily by their level of global participation on a continuum from an international corporation to a global corporation. Although many organizations have only limited global scope, a growing number of organizations, such as Dell and Microsoft, have a large number of personnel and facilities throughout the world (Snell, Morris, & Bohlander, 2016). The following section provides a brief description of the four types as identified by Beaman (2011), which are based on the types of international business operations described by their level of global participation (Bartlett & Ghoshal, 1998).

International Corporation

An **international corporation** uses its existing core competencies to expand operations into foreign markets (Snell et al., 2016). These organizations' approach is centralized and focused on learning and sharing. This type of organization competes in the global marketplace by exporting existing products and eventually opening facilities in other countries. While their corporate headquarters typically reside in the parent country, international corporations have foreign operations in one or more host countries. Companies operating as international corporations include Honda, General Electric, and Procter & Gamble (see Snell et al., 2016).

This type of international business operation presents various unique challenges for the HRM function of the organization. Two issues particularly relevant to international corporations are the host country's legal system and the host country's national culture. Legal issues might arise because of a country's minimum wage, for example. In some countries, the minimum wage is relatively high, driving up labor costs (Noe et al., 2017). Examples of cultural differences affecting international corporations are communication styles or the meaning and importance of work in the host country; such differences often impact work outcomes such as organizational commitment, job satisfaction, and intention to stay.

Multinational Corporation

A **multinational corporation** is a more complex international business operation than the preceding one. In an attempt to capitalize on lower production and distribution costs, multinational corporations' HR role is highly decentralized, locally responsive, and it operates as fully autonomous units in multiple countries (Noe et al., 2017; Snell et al., 2016). An example of a multinational corporation is General Motors (GM). While GM's headquarters and some of its operations are located in the United States, many of its manufacturing facilities have been relocated to places such as Mexico and China with the goals of reducing production costs and accessing local markets. Locating facilities to China has allowed GM to sell to the Asian markets with reduced distribution costs. The HRM issues experienced by multinational corporations are similar to those encountered by international corporations, but exacerbated by the fact that there are more countries—and country differences—to take into consideration.

One approach taken by multinational corporations has been to hire expatriates from countries other than the parent country to help with staffing and management issues (Noe et al., 2017). However, according to Noe and colleagues (2017), although hiring expatriates from other countries has its disadvantages, such issues can be overcome by requiring greater cross-training of cultural and managerial skills.

Global Corporation

Global corporations are similar to international corporations in that their HR functions are highly centralized and focused on efficiency; however, the **global corporation** also integrates its worldwide operations through a centralized home office (Snell et al., 2016). Multinational corporations produce and distribute identical products and services worldwide. Global corporations, on the other hand, emphasize flexibility and mass customization to meet the needs of differing customer groups worldwide (Noe et al., 2017). Ford represents an example of a global corporation. Ford offers two different lines of automobiles, one to its American consumers and the other to its European consumers. For example, it meets the need of European consumers

for smaller, more fuel-efficient cars by offering the Ka—a car similar to Daimler's smart car.

Because of this integrative international focus, global corporations must manage their human resources through a multicountry HRM system. This type of system is characterized by three essential attributes: (1) HR decisions are made from a global rather than a national perspective, (2) the company's management is composed of people from all over the world, and (3) decision-making and planning processes include people from a variety of cultures and backgrounds (Noe et al., 2017).

Transnational Corporation

A **transnational corporation** uses an HR approach that is locally responsible to its country location and is focused on being highly efficient plus emphasizing learning and sharing. The type of international business operation will inevitably influence the way in which the organization manages its human resources. It is feasible to conceptualize organizations on a continuum based on their level of global participation, from the domestic corporation representing the lowest level of global participation to the global corporation representing the highest level of global participation. With this in mind, we provide in the following sections of this chapter a discussion of issues surrounding the management of human resources internationally. Although these distinctions among MNEs are important, the actual structure of the MNE determines its effectiveness. There is no "best structure" that fits the distribution and marketing needs of all MNEs. Perhaps having a flexible approach to structure is the best way to manage an MNE. Use an HR approach that is locally responsive to its country location and is focused on being highly efficient plus being focused on learning and sharing.

Going Global

For domestic and international firms, becoming a global corporation is a desirable and important step due to potential sales in international markets, in addition to the ability to improve products and services through the lessons learned in different markets. Since going global requires a significant

investment, most companies that go global are fairly large and have products or services that would appeal to an international market. However, there are specialty companies for which the international market is also desirable due to country-by-country market niches. Briefly, going global requires considerable planning and learning how global companies and domestic competitors operate. The first step in going global for most companies is to establish a sales office in the countries being considered as potential subsidiary locations. This enables the company to gain important knowledge of the local culture, its regulations, competition, and living conditions. When it is possible, companies also will calculate an initial cost-benefit analysis to determine if the potential ROI indicates they should continue to explore the establishment of a subsidiary in the country.

There are also a number of important HR issues which will also need to be addressed when companies make the switch to global expansion. Roberts (2000) raised four issues that companies should consider before deciding to go global: (1) understanding the power of the people, (2) technical issues, (3) cultural clashes, and (4) privacy law hurdles. An example of understanding the power of the people cited by Roberts was that of an electrical component manufacturer in Tennessee that needed 83 faxes just to get a worldwide head count. The company had more than 26,000 employees at 163 sites in 24 countries so getting an accurate head count was difficult but quite important. Often companies feel that globalization will surely be able to solve this problem. Related to the power of the people was that a company needs more than monetary resources to go global. It also needs the willing participation of all parties involved. This process of globalization was a major organizational step, and it needed to be implemented carefully. The second problem, according to Roberts, that most people assume to be solved easily involves the technical issues and changes needed to globalize. Decisions will have to be made about in which technologies to invest, how to integrate them, and how data are shared between countries and divisions. In addition, issues such as employee readiness for new technology, privacy laws, and the types of devices (e.g., mobile, laptop, desktop) that will be utilized will need to be addressed. Mason (2009) argues that technology can help to standardize and streamline HR practices globally. We discuss more about this later in the chapter, when we discuss the role of HRIS in these firms.

Culture, the third of Roberts's issues, is also highly important. Some even argue it to be the most important for any company going global. Many attempts to go global have failed because the employees from the home country location have difficulties with the cultural diversity in other countries. Working styles in countries may be entirely different, with strict levels of hierarchy and formalities expected in some countries, while others may not have this structure.

The fourth issue deals with the varying, country by country, privacy laws. For example, the privacy laws in the United States are more liberal than the ones in the **European Union (EU).** In addition, most countries, including those in the EU, have data privacy laws specific to their own country. Batyski (2008) notes that this will require HR staff, and even managers who handle employee data, to be well trained in the privacy laws for each country in which the company operates. Notwithstanding the emerging Privacy Shield Framework recently negotiated between the United States and the EU (see HRIS in Action section at the beginning of the chapter), differing privacy laws can also impact HR reporting requirements. HR must be aware of country-specific requirements surrounding the tracking of employee data, and the HRIS utilized must be able to account for these differences. For example, in some countries, the tracking of union membership is allowed, but in others it is not. These differing regulations and reporting requirements make it very difficult to implement an HRIS that spans multiple countries and accounts for the country-specific nuances in data collection and reporting. Thus, many firms are likely to implement multiple HR systems throughout the world, to remain compliant with these differences.

In the *2011–2012 Going Global Report: HCM Trends in Globalization,* Beaman (2011) describes the decision of going global as quite difficult and time-consuming. Jeitosa Group International, in collaboration with the International Association for Human Resource Information Management (IHRIM), completed a survey of 130 multinational organizations from diverse industry sectors that focused on the factors that lead a corporation to "go global." The survey was designed to answer these questions:

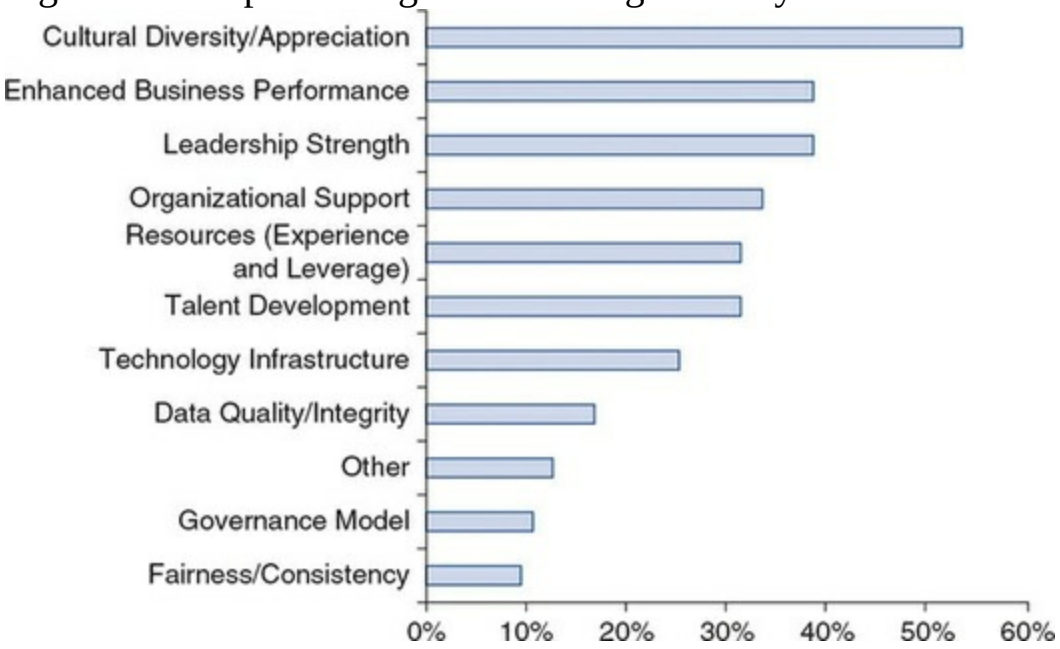
1. How does an organization decide when it should go global?
2. How does it determine whether or not its HR department and HRIS are

ready?

3. Are its business and HR functions capable of supporting a move to a global level for the organization?

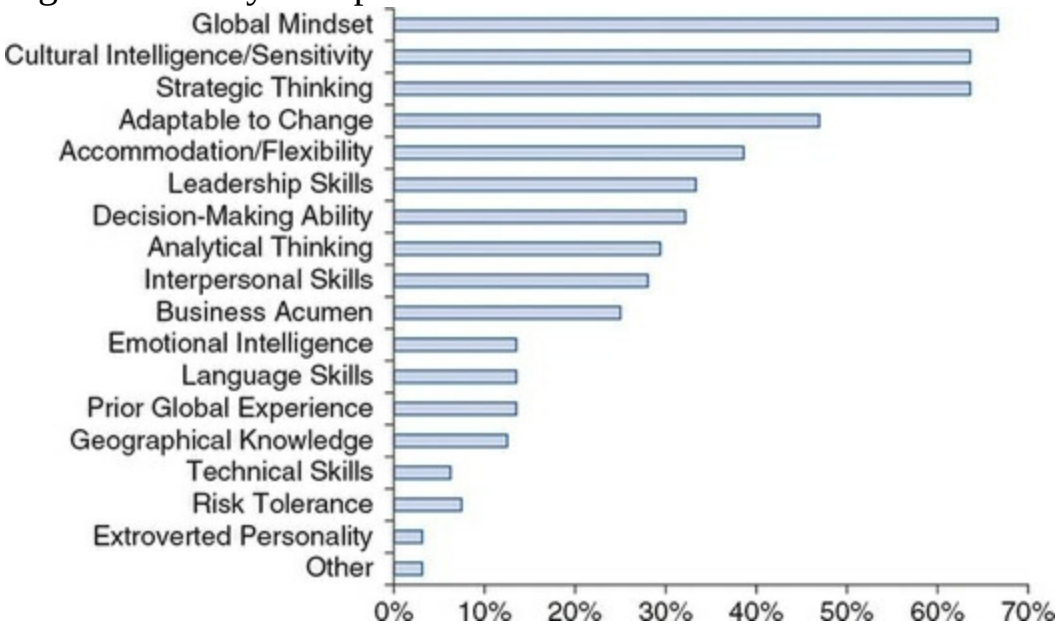
Figure 13.1 lists a number of challenges that organizations face when going global. Interestingly, the top four challenges identified in this survey—cultural diversity/appreciation (56%), enhanced business performance (39%), leadership strength (39%), and organizational support (35%)—are the same challenges that have been faced by global organizations for years (Adler, 2002; Briscoe & Schuler, 2004; Dowling, Festing, & Engle, 2013). This survey also queried respondents about the key competencies for successful global work. As seen in Figure 13.2, the top five are global mindset (67%), cultural intelligence (64%), strategic thinking (64%), adaptability to change (47%), and accommodation/flexibility (38%). The next five key competencies are all focused on management: leadership skills, decision-making ability, analytic thinking, interpersonal skills, and business acumen. As a set, these 10 competences indicate that professionals and managers working in global companies need to develop these competencies through training and experience in order for the global company to be successful. We agree with Beaman (2011), who says that "going global with HR and HR technology is challenging, but can be rewarding too. While the industry is making progress, there is more work to do" (p. 28).

Figure 13.1 Top Challenges in Working Globally



Source: Beaman (2012, p. 5). Reprinted with permission.

Figure 13.2 Key Competencies for Successful Global Work



Source: Beaman (2012, p. 13). Reprinted with permission.

The difficulties involved in managing the workforce of any MNE, including a global one, are covered in the remainder of this chapter.

Differences in HRM in MNEs

Even though there were a number of different types of international business operations described in the previous section, for convenience, these types will all be referred to as multinational enterprises (MNEs). As one might expect, there are significant differences in HRM programs and practices between a domestic enterprise and an MNE. Because the domestic organization only operates in one labor market, managing its human resources is much easier than is the case for MNEs. MNEs operate in multiple countries and must have information on the labor markets in all the countries in which they do business.

In addition, an MNE includes three types of employees, as opposed to one type in a domestic firm. These MNE employees include **parent-country nationals (PCNs)**, **host-country nationals (HCNs)**, and **third-country nationals (TCNs)**. PCNs are from the country in which the corporate headquarters of the MNE is located, while HCNs are from the countries where subsidiaries are located. TCNs are employees from countries other than the parent or host countries. In spite of these differences in the types of employees hired by a domestic enterprise and an MNE, the major programs of HRM, for example, talent management and compensation, exist in both domestic and international organizations. However, the fact that an MNE competes in multiple countries versus the single-country orientation of a domestic company contributes to the complexity of IHRM. Dowling et al. (2013) identify six key factors that contribute to the complexity of international HR management:

- More HR activities: An HR department in an international firm must be concerned with activities that would not be part of an HR department in a domestic firm, for example, relations with host governments; differences in labor laws and guidelines in the host country; and administrative details of the employees, such as international taxation, international relocation, orientation, and language training.
- The need for a broader perspective: The HR department and managers in MNEs need a broader worldview in dealing with PCNs, HCNs, and TCNs, and recognition of both the cultural differences among employees and the differences in work ethic, practices, and expectations in the employees' home countries.
- More involvement in employees' personal lives: The IHRM department is more involved in the lives of employees in the areas of taxation, education, and even banking services. It also has to address the issue of visas and housing arrangements for PCNs (expatriates) and TCNs.
- Changes in emphasis of HR programs, such as compensation, managerial style, and tolerance of employee diversity, as the workforce mix of expatriates and locals varies: The immense pool of talent available to MNEs means a varying mix of PCNs, HCNs, and TCNs in the workforce. Consequently, a number of different languages will often be spoken. This situation would dictate language training to support a common language for employees and to improve communication in the

working environment.
- Risk exposure: The IHRM department must be aware of the risks to its employees and keep them apprised of any significant problems (e.g., terrorist threats, impending war, crime in specific locations, and environmental disasters). It must be prepared for any necessary evacuation of employees.
- Broader external influences: Many factors can affect the operation and activities of IHRM in multiple countries, such as government regulations and relations, the labor market, societal concerns, and the level of technology.

Key HR Management Issues in MNEs

Managing in the global business environment creates unique complexities for managers—especially expatriate managers. In the past, organizations have relied on expatriates as a major source of staffing for their overseas operations (Schuler & Tarique, 2007). Today, though, organizations are increasingly shifting from an expatriate-focused workforce to a global workforce. Beaman (2008) argues that

> it is only by first "thinking locally" to truly understand the needs of our local business communities, and then "acting globally" to seamlessly knit together diverse business functions and (HR) systems into a holistic, global approach that we can build an effective, efficient and competitive organization. (p. 6)

In other words, building a global workforce will require a mix of local and expatriate employees working together. Some of the most important cultural factors include diversity, education, politics and law, and economics (see Snell et al., 2016).

Global Diversity and Inclusion

In many locations, the drive for increased diversity and inclusion has its basis in equal employment legislation. But beyond the legal requirements, there are

additional reasons for supporting a diverse workforce. These include (1) the moral issue of discrimination in hiring and promotion on the basis of gender and race and (2) the business case that increasing diversity and inclusion will improve the financial position of the MNE. The business case simply states that, if the consumer population is diverse, then it behooves an MNE to have a diverse workforce.

Organizations are increasingly recognizing the importance of having a global approach to the hiring and management of employees to remain competitive in the global marketplace. This search for new employees must take account of cultural differences in multiple countries by recognizing the importance of developing greater cross-cultural competence in their employees. “Driven by a need to compensate for talent shortages—and compete in an increasingly diverse marketplace—companies are extending their recruiting and promotion efforts to groups that traditionally were under-represented or not present at all” (SHRM, 2009, p. 5).

Having this type of a workforce means that the educational level, skills, background, and cultural values of the workforce will be highly varied. It is important for managers to understand and deal with the human capital needs of a highly diverse workforce made up of individuals (1) coming from different cultural backgrounds, (2) possibly speaking different languages, and (3) having different educational experiences. These education differences require that managers provide a supportive work environment for their employees. One important aspect of support is training on (1) cultural differences, (2) verbal and nonverbal communication, and (3) specific skill sets particular to the employee’s job. In order to survive, organizations must manage differences so that employees from all backgrounds can be heard, be understood, and be able to work together productively.

Political and Legal Systems

The political and legal systems within the host country will affect the type of HR practices that can be used (Noe et al., 2017). The laws and regulations of the host country are determined in part by the societal norms of that country. For example, the United States has created laws governing issues such as equal employment opportunities and fair pay standards (Noe et al., 2017);

however, these laws are specific to the United States and similar laws may or may not necessarily exist in other countries. In addition, free speech is a **cultural norm** in the United States and is protected by law. It is acceptable for organizations and individuals to speak out against the government if they do not like certain government regulations or taxes or if they think they are being unfairly treated. However, in other parts of the world, it may be highly inappropriate, and occasionally even dangerous, for organizations to speak out against the government. On the other hand, U.S. companies may impose a certain degree of censorship on employees, as long as a business necessity exists. In other countries, employees might be protected by law or by highly regulated severance practices.

Economic System

The economic system of the host country is one determinant of the way in which HR programs and practices are used. This economic system affects human capital primarily through its compensation system (Noe et al., 2017). Countries such as Germany, Switzerland, and Japan have strong educational systems and provide employees with high wages. In comparison, developing countries such as the Philippines, Afghanistan, and Haiti have poorer educational systems and provide substantially lower compensation to their workforces. A study by the U.S. Department of Labor (2012) indicates that the average compensation for employees in the manufacturing sector in the Philippines was $2.01 per hour, compared to $35.53 per hour for manufacturing employees in the United States. If the workforce of an MNE in the Philippines were composed of employees from both the Philippines and the United States, an equity issue might arise and must be managed effectively.

HR Programs in Global Organizations

International Staffing

The complexities inherent in managing a global organization make staffing an especially important part of the IHRM system. When staffing for

managerial and nonmanagerial positions, the MNE needs to determine if personnel will be selected from the home-country, host-country, or third-country talent pool.

As described by Snell et al. (2016), each of these employee groups provides a different advantage for the MNE. A common issue for all of these employee groups, however, is the underutilization of and lower pay for female employees (Adlung, 2010). Adlung (2010) found that, in a number of European countries, females received approximately 25% less salary than their male counterparts. This point suggests that MNEs should emphasize hiring female employees and paying them fairly. Adlung suggests that companies could utilize an integrated talent management system such as PeopleSoft, TalentSoft, or SuccessFactors to leverage this untapped talent pool and reduce the salary gap between male and female employees.

Selecting Global Managers: Managing Expatriates

One of the most difficult, but important, responsibilities of the IHRM function is the selection of managers from the parent country for assignments in host countries. Most of the literature on this topic is focused on the selection of expatriates, whether they are PCNs, HCNs, or TCNs. The reason expatriates can be from any of these three categories is that, at the managerial level in an MNE, these individuals will move from country to country. Thus, the term **expatriate** will be used to designate global managers, regardless of the home country. To understand the difficulty in selecting expatriates, we will discuss in this section (1) the **cultural environment of countries**, (2) expatriate failure and its causes, and (3) selection criteria and procedures for expatriates.

The Cultural Environment of Countries

One of the most important aspects of an expatriate's job that will significantly affect performance is his or her interaction with the local government and people of a country. Because of this interaction, most expatriates will experience **culture shock** as they move from country to country within an MNE. Culture shock can be mild, for example, for a German manager who

relocates to a subsidiary plant in France, or quite severe, for example, for an Australian manager who moves to a subsidiary in Egypt. Thus, one of the most important tasks of the IHRM department is to gather information about the culture of countries where the MNE does business to try to estimate the cultural differences between the home countries of employees and the countries where they may be assigned. An HRIS can be very useful in that it can serve as a repository of this information, and, thus, cultural profiles of countries can be quickly generated.

Further emphasizing the importance of a country's culture, Briscoe and Schuler (2004) state,

> Knowledge about and competency in working with country and company cultures is the most important issue impacting the success of international business activity. And possibly the area of business that is most impacted by cultural differences is the human resource function. (p. 114)

Culture, as defined by Hofstede (1991), "is the collective programming of the mind which distinguishes the members of one group or category of people from another" (p. 6). Hofstede's research was the first systematic study of the dimensions of national culture, and he identified five dimensions on which the cultures of countries differ. In addition to Hofstede's work, other studies have examined differences in national culture (GLOBE Research Team, 2002; Trompenaars, 1992). Trompenaars (1992), like Hofstede, found five distinct cultural factors that differentiated country cultures, while the Global Leadership and Organizational Behavior Effectiveness (GLOBE) research project categorized countries on nine cultural dimensions. Regardless of which study we examine, all of the authors cited in this chapter agree that the cultural environment of a country has a strong effect on the management of employees and should be considered when selecting expatriates or implementing people management practices.

To define the culture of a country, Snell et al. (2016) list the following elements that will differentiate countries in terms of their cultural

environment for international business: (1) education/human capital, (2) values/ideologies, (3) social structure, (4) religious beliefs, and (5) communication. Information gathered in these five categories could be used to create profiles of the cultural environment of countries in which the MNE does business. It is most important to emphasize that this information could be stored electronically in the HRIS and maintained by the IHRM department. Major HRIS suites such as Oracle's and SAP's have this capability, or it can be customized by the MNE.

A final note on country culture: It will have an *effect on all the activities and programs* of the IHRM function, including selection, training, compensation, and performance management.

Expatriate Failure and Causes

Expatriate failure is defined as the return of an expatriate to the home country before the period of the assignment has been completed. Thus, expatriate failure represents an error in a selection or follow-up decision. There is such an emphasis on expatriate failure because of its costs to the MNE. These costs are both direct and indirect. Direct costs include the actual money spent on selecting and training, relocation costs for the expatriate (and family), and salary. These costs can be quite substantial. However, indirect costs can frequently be higher than direct costs. Indirect costs are harder to quantify, but they could include loss of market share in the country, negative reactions from the host country's government, and possible negative effects on local employee morale. For example, expatriate failure could lead a local host government to insist that, in the future, only an HCN fill the position. Finally, there will be the indirect costs experienced by the returning expatriate in terms of personal failure, loss of respect by peers, and possibly negative influences on future promotions.

What are the causes of expatriate failure? Although there has been considerable research on this topic, the answer is not completely clear. It is safe to say that one cannot generalize from the research results to every expatriate situation; however, the results do provide a guide to the information that should be collected during the selection of expatriates. In general, one could state that the major factor affecting expatriate failure is the

inability to adjust to the new situation and culture by the expatriate and her or his family.

In terms of specific reasons for expatriate failure, Dowling et al. (2013) cite the global surveys of the Organizational Research Counselors (ORC; 2002) and the GMAC Global Relocation Services and Windham International (2002). The problems reported by expatriates and companies in these surveys were

- spouse/partner dissatisfaction,
- inability to adapt,
- difficulties with family adjustment in the new location,
- difficulties associated with different management styles,
- culture and language difficulties, and
- issues associated with the accompanying partner's career development.

Similarly, Briscoe and Schuler (2004) indicate that "a number of surveys and studies have found that the most important factors in the early return of expatriates . . . lie in the inability of their families (and/or themselves) to adjust to the foreign environment" (p. 242). The clear implication of these findings is that the expatriate's family or partner must be considered in the selection decision process.

Selection Criteria and Procedures for Expatriates

In selecting expatriates, IHRM professionals should remember that the selection process is an exchange between the organization and the employee. Furthermore, the prospective expatriate's family must be involved in the exchange. In terms of the utility of selection, that is its cost-effectiveness (covered in Chapter 10), making a mistake is extremely costly. IHRM professionals must be cognizant of the causes of expatriate failure when developing the selection procedures, for example, tests or interviews, and also have an understanding of the cross-cultural issues in the evaluation and recommendation of employees for an expatriate assignment.

The factors involved in the selection of expatriates can be divided into two general categories—individual and situational (Dowling et al., 2013). In the

individual category are technical ability, **cross-cultural suitability**, and family requirements. Technical ability is quite clear and would include both managerial and technical skills. The person selected must be technically proficient in his or her field (e.g., electrical engineering) and also must have a good performance record as a manager. Technical ability is very important to the selection process, as indicated by the results of the ORC (2002) worldwide survey, in that 72% of responding firms used it as the first screening criterion in their selection procedure. In selection terms, technical ability would be the *absolute minimum* requirement for the first screening of prospective employees for the assignment. Note that technical incompetence or poor performance is not mentioned as a cause of expatriate failure; however, job-related factors could possibly cause premature departure—for example, the nature of the job not being as described or the expatriate being unable to transfer technical or managerial skills to the new assignment.

The second individual factor, cross-cultural suitability, has several aspects. It could include language ability, cultural empathy, adaptability, and a positive attitude toward the assignment in the specific country being considered. Although technical ability is very important for success in the assignment, cross-cultural suitability is equally important since a number of the causes of expatriate failure are directly related to this factor.

The third individual factor, family requirements, has a great deal to do with the success of the expatriate's assignment. In all the research and surveys on causes for expatriate failure, the poor adjustment of the accompanying spouse or partner and children has been well documented as one of the major causes of expatriate failure. Although it is appropriate to use standard testing and interview techniques to assess the technical ability and cross-cultural suitability of potential expatriates, evaluation of these factors means the involvement of the family. Interviewing the candidate's spouse or partner and children regarding the assignment is frequently done. In addition, most MNEs have learned to build in a pre-assignment visit for the expatriate candidate and his or her family as part of the selection process. This involvement of the entire family in the selection process has become a common practice for MNEs. In fact, if there are two possible locations for the assignment, companies may encourage a pre-assignment visit to both countries.

With regard to the general factors that affect the assignment situation, Dowling et al. (2013) list country and cultural requirements, language, and MNE requirements. Country and cultural requirements could include work permits and visas. Generally, the work permit is given to the expatriate, and the accompanying spouse or partner may not be permitted to work. As for the children, there may not be schools that would be acceptable, particularly if the children do not speak the language of the host country. In some expatriate assignments, either the children receive language training or there is a school in which their native language is spoken. The opportunity for the spouse or partner and the children to learn another language is sometimes seen as a benefit of the international assignment. Of course, this relates to the second factor of language. Difficulties in language are a major barrier to cross-cultural communication; thus, this is a very important factor for the expatriate and the family. Fortunately, many companies offer language training to the entire family prior to departure for the assignment. In addition, the increasing availability of technologically mediated language training (including smartphone apps, Web-based courses, etc.) as well as translation services may reduce the magnitude of language difficulties. The final factor, MNE requirements, could involve getting permission from the host country for the selection of any expatriate. This is common in joint international ventures. Other factors could be the duration and type of assignment. When the duration of the assignment is for only two to three months or the assignment is in a "high-risk" country, the family members usually would not accompany the expatriate.

Selection of expatriates is a critical function of IHRM, particularly in MNEs where expatriate assignments are used to "groom" managers for higher levels of management. Many of the factors to consider in selecting expatriates and the factors causing expatriate failure are handled by training. However, the software applications available can greatly reduce the time required to make this process work. The next section focuses on training in the MNE, primarily the training of expatriates.

Training and Development of Expatriates

As was done in the previous section, all managers in an MNE will be considered as expatriates since their career assignments and development

typically mean that they will move from country to country. Training and development activities and programs in MNEs also include nonmanagerial employees of all types—PCNs, HCNs, and TCNs. Because traditional training and development were covered in detail in Chapter 11, most kinds of typical organizational training (e.g., orientation or technical training) will not be discussed. However, the use of an HRIS and its applications will still be discussed. In fact, the training applications that are integrated into the HRIS are increasingly useful for training expatriates. Not only will the expatriates' personal, work experience, and skills information stored on the HRIS be easily accessible, but also the results of the training in terms of expatriate success or failure can be recorded. This information should be useful for future expatriate selection.

The corporate IHRM department has responsibility for all training; however, this responsibility is usually decentralized by delegating it to the MNE's subsidiaries. There may be training programs developed at the headquarters of the MNE, but it is unusual for these IHRM professionals at headquarters to deliver programs to the subsidiaries when it can be done more economically by the local IHRM professionals. Most of this local training for nonmanagerial employees will vary by different geographic locations of the MNE. Therefore, some cross-cultural training for nonmanagerial employees who are not HCNs will be necessary, for example, language training.

This section will cover expatriate training in detail and will be divided into the following subsections: (1) the purpose of expatriate training, (2) **predeparture training** and the repatriation of expatriates, and (3) transfer of training.

Purpose of Expatriate Training

The dual purpose of any training program is to inform and motivate employees. Even training that is focused on learning a manual skill, for example, keyboarding, has both knowledge and motivational aspects. Clearly, the employee is learning a new skill, but with the proper training method, the employee can be encouraged to be more productive; and with the improved skill, the employee may be happier in the job. In addition to these two purposes of training, the first specific purpose of expatriate training is to

supplement the selection process and assist the expatriate and her or his family in adjusting to the new situation. It must be emphasized that selection of expatriates is never perfect. Why else would there be expatriate failure? Thus, the training program content for expatriates is based on both the selection criteria identified above and the causes of expatriate failure.

The second specific purpose of expatriate training is economic. Recall that the expatriate brings both technical and managerial expertise to the subsidiary when there are no HCNs ready to fill the positions. In addition, the expatriate assignment is used by MNEs as a career development process for managers. Thus, the MNE has significant economic reasons for using expatriates. When one calculates the potential **direct and indirect costs of expatriate failure**, the amount of the investment increases. The MNE makes a major investment in selecting employees for placement in its subsidiaries, and training programs are another IHRM element used to protect that investment.

Predeparture Training

It should be noted that predeparture training programs do not focus on the technical ability of the expatriate, unless there are new technical or managerial skills necessary for the assignment, for example, the introduction of new technology. Because one of the major causes of expatriate failure is the dissatisfaction of or the lack of adjustment by the employee's spouse, partner, or family, the inclusion of these people in predeparture training is very important. To assist the adjustment of the expatriate and his or her family to a new culture, predeparture training typically includes training in cultural awareness, language, and practical matters regarding daily living in the new culture. Most MNEs will also include preliminary visits as a part of predeparture training.

Another element in predeparture training that is highly recommended is **repatriation** training. Formal repatriation is the process that occurs as the expatriate and family return to their homeland. However, recent research and literature has indicated that the repatriation process should begin before the person leaves the home country. The expatriate may find on return that the situation that was expected in the home country (e.g., a promotion to a new position) is not available; and thus, the expatriate will seek other

employment. This problem of losing expatriates during the repatriation process has been well documented in the literature (Black, 2000; Feldman & Tompson, 1993; Poe, 2000; Solomon, 1995). There is considerable discussion in the recent literature on the design and implementation of repatriation programs that suggests that companies need to begin repatriation training prior to the expatriate leaving the home country—in predeparture training—rather than waiting for the return of the expatriate (Briscoe & Schuler, 2004; Dowling et al., 2013; Evans, Pucik, & Barsoux, 2002), and most companies consider repatriation as part of the career development program of the MNE.

Training in cultural awareness, language, and practical matters regarding daily living in the new culture constitutes the predeparture training that the expatriate and family will attend. It is important to recall that expatriate selection is a two-way street. The expatriate still has the right to decline the assignment. Thus, the predeparture training both informs and attracts, which are the two purposes of training. There are a large number of topics that can be included in predeparture training. The topics listed in Table 13.1 make up the possible content for the predeparture program. Note that this list could change depending on the host and parent countries involved.

TABLE 13.1 ■ Topics for Predeparture Training

1. Cultural values and religions
2. Websites for country information
3. Country history, recommended readings, videos,* and achievements in the country
4. Classical literature describing the country's history, its folkways, and heroes and heroines
5. Information about other HCN expatriates in the country
6. Information on job opportunities for spouses and partners
7. Descriptions of the educational facilities and opportunities for families
8. Current news about the country, particularly its relationship to the parent country
9. Traditional family roles of father, mother, and children
10. Locations for shopping and shopping hours
11. Dominant language of country; extent of bilingualism in country
12. Nonverbal gestures and their meanings
13. Political structure, particularly as it affects the operation of the MNE
14. Descriptions of currency, temperature variations, transportation, hours of business
15. Sightseeing, including historic, artistic, and important cultural locations that would appeal to all the family

Note: This is a very general list, which will vary from country to country.

*Videos, Web-based, and even app-based training may be made available to expatriates and their families.

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* Videos, Web-based, and even app-based training may be made available to expatriates and their families.

Transfer of Training

The idea that the predeparture training program could change as a function of the two countries involved has been recognized by scholars, and several models have been proposed to provide guidelines on predeparture training

programs (Mendenhall, Dunbar, & Oddou, 1987; Tung, 1981, 1998). These researchers argue that predeparture training should not be viewed as "one size fits all," but rather that the training design and program should be contingent on other factors in the expatriate assignment. According to Tung (1981, 1998), the two factors that most affect predeparture training design are (1) the dissimilarity between the expatriate's native country and the host culture—low to high—and (2) the expected amount of interaction between the expatriate and members of the host country—low to high. Based on an analysis of these two factors, Black and Mendenhall (1989) argue that the design of the training program can then vary on three dimensions: (1) the training methods used, (2) the level of training rigor, and (3) the duration of the training program. For example, if both the dissimilarity between the expatriate's native country and the host culture and the expected amount of interaction between the expatriate and members of the host country are quite high, then the predeparture training should be rigorous and the length of training should be one to two months. In this situation, the training methods would attempt to immerse the expatriate in the host country's culture through assessment centers, simulations, sensitivity training, and extensive language training. As mentioned earlier, the use of the HRIS to track and analyze the success or failure of these training programs will enable the MNE to make more effective decisions about expatriates and their training in the future.

Performance Appraisal in MNEs

Performance appraisal is an important process for documenting the performance of employees, determining areas for development, deciding on pay increases and promotional opportunities, and giving employees the opportunity to express their views (Von Glinow, Drost, & Teagarden, 2002). The type of performance appraisal conducted and its content depend on the specific job requirements and personal attributes of the person being appraised (Schuler, Budhwar, & Florkowski, 2002). This is particularly true when we compare the appraisal of expatriates with that of HCN and TCN employees. The section in Chapter 12 on performance evaluation and performance planning covers a number of HRIS applications that could be used for performance appraisal in an MNE. Naturally, the inclusion of plants with a diverse employee population in multiple countries creates considerable complexity, particularly when the results of the appraisals are being used to

move managers from country to country. However, most vendors of HRIS products have packaged software applications available that can be modified for local conditions in each specific country.

Important considerations in the appraisal of an expatriate's performance are who should conduct the appraisal and what performance criteria are specific to the expatriate's situation (Snell et al., 2016). The first question is who should complete the performance appraisal. Typically, the performance of employees is appraised by their supervisors. Expatriate managers are geographically distanced from their parent-country supervisors, and, as a result, supervisors who are located in the parent country cannot observe the day-to-day activities of these employees (Dowling et al., 2013). Therefore, managers of expatriates tend to base their evaluations of the person on the objective criteria used for other employees in similar positions located in the parent country. A potential problem with this type of assessment is that the parent-country manager does not have direct information or observational data about the more subjective performance criteria, such as the expatriate manager's leadership skills or performance within the context of the subsidiary (Borman & Motowidlo, 1993). Moreover, the supervisor located in the parent country may not be aware of culturally bound biases that constrain the job performance of the expatriate manager.

Because of these complexities, it may be most appropriate to obtain multiple ratings of the expatriate's performance through the use of a 360° feedback system (Dowling et al., 2013). Ratings of the expatriate manager's performance could be garnered from his or her superiors, peers, and subordinates in the expatriate assignment, as well as from the expatriate himself or herself. This would provide a clearer picture of the expatriate's total job performance. In fact, in a study of 58 U.S. multinational firms, Gregersen, Hite, and Black (1996) found that 81% of the companies used more than one rater when assessing the job performance of expatriate employees. Evidently, HRIS with culturally consistent user interfaces and well-designed privacy, security, and useful outputs may go a long way to guarantee acceptance and create an equalitarian organizational culture.

Managing International Compensation

The management of compensation[3] in an MNE is one of the most complex but critically important functions of the IHRM department. Its complexity comes from having a mix of PCNs, HCNs, and TCNs within one company and, thus, having to handle wage, salary, and benefits information that differs across countries. As a result, the IHRM compensation manager must be aware of differences in taxation, labor laws affecting compensation and benefits, currency fluctuations, and cost-of-living differences within and between countries where the MNE has a presence. The criticality of compensation and benefits management by the IHRM rests, in part, on the effects that salary and benefits have on employee motivation. In spite of differences across countries regarding the motivational factors in the workplace, money seems to be consistently at the top of the list.

[3] In this chapter, compensation will refer to the entire wages, salaries, benefits, and extra allowances available in an MNE.

The other reason for the critical importance of compensation management in subsidiaries is its link to the strategy of the MNE. To help us understand some of the important elements and dynamics of compensation in an MNE, this section will cover (1) the objectives of international compensation, (2) the components of international compensation, and (3) two approaches to international compensation.

The Objectives of International Compensation Policy

Actually, the objectives of a compensation policy in an MNE are similar to those in a domestic company. It has been fairly well established in the management research literature that compensation administration is closely related to the strategy of the firm. For example, if the company has forecasted increased sales in the next year and thus has determined a need for new employees with specialized skills, it may be necessary to pay above the labor market's "going salary rate" in order to get the best available individuals. This necessity would be especially true when information from the labor market indicates that there is a shortage of people in a particular country having the skills needed for the target job—for example, computer

programmers. Similarly, when the labor market statistics indicate that there is an abundance of people with the skills necessary for a specific job, it would be recommended that the compensation level match the labor market values.

As in a domestic firm, the *first objective* for an MNE is to align its compensation administration with the strategy of the firm. Of course, compared with the domestic firm, this alignment is much more complex for the MNE. It requires the MNE to have accurate and up-to-date labor market compensation information for all the countries in which it has a presence. This requirement is one of the most powerful advantages of having an HRIS with labor market information for the IHRM department. Labor market statistics, such as average compensation as well as forecasted shortages and surpluses for jobs, are available for most countries and can be stored in the HRIS. The applications in the computer software that produce analyses of these data would be quite similar to those described in Chapter 12. However, it should be clear that the reports generated from the HRIS would be significantly more complex in an MNE, since multiple countries would be involved.

The *second objective* of compensation administration in an MNE, as in a domestic firm, is to affect employee motivation in several ways. It must motivate employees to (1) join the firm, (2) be productive while members of the firm, and (3) stay with the firm. Employee motivation, then, is an important objective of an MNE's international compensation policy, which is complicated since multiple cultures are involved. Although most cultures see monetary rewards as motivational, there are clear differences across world cultures in terms of the other factors that motivate employee behaviors. For example, the meaningfulness of the work may be very important in some cultures, whereas the opportunity for promotion would be most important in other cultures.

The *final objective* of compensation policy for an MNE is that it must be perceived as fair by the employees. This notion of fairness or equity has been shown to be a powerful motivator of human behavior (Colquitt, Conlon, Wesson, Porter, & Ng, 2001), and it may be the most important objective of an international compensation policy. Given the mix of employees from different companies (PCNs, HCNs, TCNs), *perceived or real* differences in

wages or benefits between groups of employees could lead to considerable dissatisfaction among the less privileged groups and consequently affect the retention of employees. Easily understandable user interfaces in compensation-related HR information systems should be essential for organizations interested in increasing transparency in and satisfaction with pay packages designed to support the company's strategy.

The Components of International Compensation

The components of an international compensation system are very similar to those of a domestic program. The major components are a base salary and a set of benefits. However, extra pay premiums would be much more complex for an MNE. For example, there are foreign-service or hardship premia for expatriates, whether they are from the parent or a third country. Other premiums could be based on the "risk level" of the assignment in the country. Although most domestic companies give cost-of-living allowances (COLAs) based on where one works (e.g., rural vs. urban locations), MNEs must also use between- and within-country COLAs to have an equitable and attractive compensation system. These considerations, along with the other compensation issues discussed, make managing the compensation system a "living nightmare" for the IHRM department. Having the employee, country, and compensation/benefits data in an HRIS means that IHRM professionals have the ability to access important information quickly for making both policy and operational decisions about compensation in an MNE.

Two Approaches to International Compensation

The IHRM textbooks mentioned earlier in this chapter (Briscoe & Schuler, 2004; Dowling et al., 2013; Evans et al., 2002) all discuss two approaches to international compensation—the **going-rate** and the **balance-sheet approaches**. In the going-rate or **host-country approach** (Snell et al., 2016), the base salary for international employees is tied to the salary levels in the host country. For example, an expatriate would earn pay that is comparable with the salaries of employees in the host country. Thus, the compensation levels for employees would depend on wage surveys of (1) local nationals (HCNs), (2) expatriates of the same nationality, and (3) expatriates of all

nationalities (Dowling et al., 2013). For low-pay countries, the base pay and benefits could be supplemented with additional payments. It should be obvious that HRIS applications for compensation based on the going rate would be useful for establishing initial compensation levels, particularly for expatriates. Having this database would also be quite useful for handling complaints by any MNE employee regarding the equity of his or her compensation. Computer-based compensation applications are available from the major providers of software platforms such as Oracle or SAP.

The second approach to compensation policy, the balance-sheet approach, has as its goal the maintenance of a home-country living standard plus a financial inducement for accepting an international assignment. As Dowling et al. (2013) note, "The home-country pay and benefits are the foundation of this approach; adjustments to home package to balance additional expenditure in the host country and financial incentives (expatriate/hardship premium) are added to make the package attractive." Although this approach would appear to be more attractive to the expatriate, it has a disadvantage for the IHRM department—it can be very complex to administer. Software applications and reports from an HRIS can assist in untangling these objectives, and probably perceived inequalities, but IHRM professional and line managers are still required to explain these programs to employees.

In sum, compensation is probably the most difficult and complex of the HR programs to implement and administer in an MNE. However, it is critically important to the equity exchange (or psychological contract) between the company and its employees; in consequence, it is likely to affect employee motivation. Interactions between employees and their immediate supervisors in a domestic enterprise or an MNE regarding compensation have the greatest impact on motivation of the employees. Having an HRIS produce the needed data and information on the equity of compensation among employees is a tremendous boon to employee relations.

HRIS Applications in IHRM

Introduction

It should be apparent from the previous sections of this chapter that HRM in an MNE is significantly more complex than in a domestic firm. As business becomes more global, ignoring its international aspects would be foolish. One of the challenges facing these companies last century was lack of sources for, and the slow speed of transmission of, important HR information for effective management decisions. However, with the current technologies and applications, difficulties in executing the basic HR functions of planning, recruiting, selecting, training, and managing performance in MNEs have been reduced through more sophisticated and better integrated HRIS.

Mason (2009) suggests that the successful implementation of an HRIS depends on three factors: (1) choosing the right vendor for technology, (2) choosing the right platform for HRIS implementation, and (3) ensuring a smooth company rollout. Johnson and Gueutal (2011) also suggest that "using external vendors is generally more cost- effective and often will provide a more complete HR solution" (p. 2); they go on to compare choosing an "integrated solution" that supports multiple HR subfunctions with "best-of-breed solutions" in which organizations work with several vendors to supply the best available HRIS solution for each of their functional areas. Ruël and Bondarouk (2012) also note that e-HRM trends may help discern the extent to which HR practices are converging (or diverging) across nations.

Specific HRIS applications for MNEs have been noted previously, mostly in concert with software platforms such as Oracle and SAP. These two platforms have all HR applications needed for a global corporation. Not only are these the only software providers available for software applications in the IHRM field, but they are also good starting points for the student interested in examining the variety of software that can be used in an HRIS. Thus, this last section of this chapter will focus on broader issues in the application and use of an HRIS in IHRM. Problems and potential solutions will be examined and discussed briefly under three topics: (1) organizational structure for effectiveness, (2) IHRM–HRIS administrative issues, and (3) HRIS applications in MNEs.

Organizational Structure for Effectiveness

The issue of the *most effective* structure for the operation of an HRIS in an MNE has been a "moving target." The most common advice regarding the management of an MNE has been to "**think global, act local.**" This advice applies to the total management process of an MNE—its strategy, operations, finance, marketing, and HR—and has been followed religiously for many years in international management. However, Beaman (2008) has provided arguments for a different approach, at least in terms of the development and use of an HRIS in international organizations. As she states,

> I maintain that we have been going about globalization the wrong way. The slogan, "Think Global, Act Local" . . . is completely the inverse of what we should be doing with our HRIT [synonym for HRIS] organizations. Rather, it is only by first "thinking locally" to truly understand the needs of our local business communities, and then "acting globally" to seamlessly knit together diverse business functions and systems into a holistic, global approach that we can build an effective, efficient and competitive organization. (p. 6)

A well-established piece of advice in the management literature has been that "structure does not drive success—people do." So to build an organizational structure for an HRIS in an MNE, we should consider Beaman's very reasonable suggestion.

IHRM–HRIS Administrative Issues

Service-Oriented Architecture

It may be repetitive, but it is important to reexamine some of the HRIS approaches covered in Chapter 8 in terms of HRIS applications in an MNE. These applications can be much more useful in an international firm than in a domestic one. One of the most important approaches for handling administrative issues in an MNE is the use of a service-oriented architecture (SOA). As discussed in Chapter 8, an SOA "is a paradigm for organizing and utilizing distributed [computing] capabilities that may be under the control of

different ownership domains . . . providing a uniform means to offer, discover, interact with and use capabilities to produce desired [business] effects" (OASIS, 2006, p. 8). SOA is focused on providing a service for a function that is well-defined, self-contained, and context and platform independent, a function that adds value to the organization's business purpose rather than simply being focused on the technology itself. In effect, SOA is a collection of internal and external services that can communicate with each other by point-to-point data exchange or through coordination among different services to achieve a business purpose. As a result, an SOA can combine multiple business functions from different organizational departments, for example, production, marketing, and HR, that have similar electronic transactions (such as change of address or salary level) into a central procession unit. SOAs were created when it was discovered that the various departments of organizations (marketing, finance, operations, R&D, and HR) were storing the same basic information on employees. Creating an SOA was a way to use the IT capabilities of an organization more efficiently.

Outsourcing, Offshoring, and Insourcing

MNEs were the first organizations to outsource many of their jobs that required low levels of skills (e.g., call centers). Outsourcing in HR had been done for years, for example, using Automatic Data Processing, Inc. (www.adp.com/corporateLanding) for payroll administration. However, the HR departments in the 1990s were looking to outsource other programs (recruiting and selection) to supposedly save money for their operations. Thus, using the Internet for outsourcing HR programs became a reality (Gueutal & Stone, 2005; Walker, 2001). Most of these approaches failed for a variety of reasons; the major one had to do with the privacy and confidentiality of employees' personal data. Still, because of the tremendous financial benefits if the MNE could use outsourcing or offshoring, these practices continued. Another major problem, however, was that many companies outsourced or offshored HR functions that were a critical part of the primary business of the organization, for example, talent management. Thus, many companies reverted to insourcing certain business processes, particularly those in the HR department.

HRIS Applications in MNEs

As discussed in this chapter, most of the HRIS applications available for a domestic company can be used for MNEs. However, some modifications are necessary due to the complexity of the database in an MNE. In today's global environment, access to data from any physical location in the world is increasingly important. Teams of employees may be stationed in Thailand, India, and the United States. As covered in Chapter 2, two issues arise when data are shared across wide geographic locations. These are (1) managing the day and time of a transaction and (2) determining where to store the various components of the business application, DBMS, and database.

As part of a global information system design, organizations have chosen to break their business applications and DBMS into components, often called "tiers." More detail on tiers was covered in Chapter 3. Traditional client-server architectures broke an application into two tiers, typically with the user interface and some business logic on the user's computer, such as a PC (the client), and the database and mainstream parts of the application stored on a server. In today's global environment with high-speed data networks, N-tier architectures exist with databases and applications being distributed among many different computers around the world. So if, for example, you are in an Internet café in Bangkok trying to get information about your benefit election, the hosting computer may be in London and the data may be located on a computer in Chicago. In sum, computer networks are created that provide instant access to these operational data, allowing real-time decision-making capabilities regardless of one's physical location.

A centralized database allows a company to confine its data to a single location and, therefore, to more easily control data integrity, updating, backup, queries, and access. A company with many locations and telecommuters, however, must develop a communications infrastructure to facilitate data sharing over a wide geographical area. The advent of the Internet and a standardized communication protocol made the centralized database structures and geographically dispersed data sharing feasible.

The database structures and system architectures we have discussed would be very useful to a multinational enterprise. Consider the differences between a

compensation database for a domestic corporation operating in a single labor market and for an MNE. The multinational's compensation database would include labor market data for all countries in which the MNE has a presence, for example. Also, a great number of the modifications to an HRIS in an MNE would be driven by the different labor laws and regulations of the various host countries. As noted, there is software available for IHRM, but the use of this software demands that the database be accurate and timely. Being able to create and access reports based on employee data, and do it quickly, requires that the data be accurate and up to date—an axiom that has been emphasized throughout this book.

Summary

Globalization is a reality. Twenty-five years ago, it was the reality primarily for major corporations of the caliber of General Electric (GE) or IBM. Now, it has become increasingly important for midsize firms—the fastest-growing group in all countries. This chapter has examined the implications of this globalization on the HRM function in MNEs and has documented the explosion of the HRM function into a separate field, IHRM. How IHRM has become increasingly complex by expanding on the traditional HR functions of selection, training, and compensation was also covered. The complexity of having diversity of employees (PCNs, HCNs, and TCNs) and of contending with the varying laws and practices of host countries dictated that MNEs abandon the paper-and-pencil system for computer technology.

The advantages of having employee information stored, manipulated, and reported using computer technology were discussed relative to the use of these capabilities in multiple IHRM programs. However, some of the more critical information that an HRIS can store, analyze, and produce reports on is contained in the cultural and legal profiles of countries. This information is valuable in all the activities and programs of the IHRM department and significantly influences the management of the many parts of an MNE.

Key Terms

Discussion Questions

1. Describe the differences between domestic and international HRM.
2. What are the different types of organizational forms that corporations use for international operations?
3. What are the three types of employees who work in MNEs? Explain how an HCN could change to become a TCN in an MNE.
4. Describe the staffing process in an MNE. How does it differ from that of a domestic-only corporation?
5. What are the main causes of expatriate failure?
6. Describe a training program for expatriates. In what ways do HRIS help

improve their effectiveness and efficiency? Why is it recommended that the family of the expatriate also receive training?

7. Is there a best method for completing performance appraisals for each of the three different types of employees in an MNE? If so, describe the ways in which an HRIS may help.
8. What are the main objectives of an international compensation plan? Would an “integrated solution” or a “best-of-breed” solution make more sense for a large manufacturing corporation? Do you believe that your answer would be different for a mid-sized company in the same industry? Explain your answer.
9. What are the modifications necessary for using HRIS software applications that are designed for domestic companies in an MNE?

Case Study: Global Issues in a Multinational Company

A large MNE in the cookware industry was having difficulties maintaining its market share due to a number of mergers among other competing firms in the industry. The MNE, with corporate headquarters in Canada, had production plants in 15 countries and a company presence in a total of 29 countries. Although the firm had a number of competitors, its product was considered as having the highest quality—the Mercedes of cookware. The firm was family owned and founded in 1937. The most pressing problem was how the firm could stay competitive in the marketplace and stop decreases in sales. Naturally, it was highly desirable to increase sales beyond annual averages, but, first, the firm had to change something to stabilize its place in the market.

Examining the problem, the CEO and the corporate board, consisting of all the corporate vice presidents as well as the CEOs of all the international locations, concluded that it was necessary to reduce operating costs by 5% to 6% to remain competitive. Thus, it was decided to determine if these cost savings could be achieved in operations, raw materials, finances, or HR.

The MNE managers examined the latest production technology in their industry. The firm discovered that its technology was fairly current and the

few technological changes available would only help decrease costs by less than 1%. However, these modifications to their current technology were very expensive and did not appear to have a favorable return on investment (ROI).

Trying to obtain better financing was nearly impossible since the MNE had very favorable financing currently. The same was true for raw materials, since a decision to use cheaper materials would greatly reduce the quality of the company's products.

As a result, the management of the MNE asked the IHRM department for some suggestions as to how personnel costs could be trimmed. However, there was one constraint established by tradition in the company. The MNE had never had a layoff of employees in its history, and the CEO refused to use this option to reduce personnel costs. One of the complicating factors was the different labor legislation as well as the very different cultures in the 29 countries in which the MNE did business.

Case Study Questions

1. How would you approach a solution to this problem for the MNE?
2. Assuming that reducing personnel costs is the best, and probably only, way to reduce overall corporate costs, what specific programs would you suggest to reduce costs? Why?
3. How would an HRIS for the MNE aid in finding HR programs to help solve this problem? What would be the most important data to access in the HRIS for the units and divisions of the MNE to determine feasible HR programs?
4. Are the problems of reducing personnel costs for an MNE different from those for a domestic-only company? Explain.

Student Study Site

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14 HR Metrics and Workforce Analytics

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Michael J. Kavanagh

Editors' Note

The capacity to effectively manage an organization's workforce is limited by the type and quality of data available to managers. Better information provides a strong foundation for better understanding how HR can support the strategic direction of organizations. However, data alone are not the answer. As illustrated in this chapter, the best organizations will not simply collect more data. Instead, they will leverage data to solve key business problems. Rather than starting with the data, organizations should start with an HR or organizational problem or opportunity and determine what data are necessary to most effectively solve the problem or take advantage of the opportunity. Ultimately workforce analytics and Big Data are only as effective as the problems they are able to help the organization solve. This chapter offers a brief history of the efforts involved in the development of HR metrics and workforce analytics and of how these efforts have been enhanced by the advent of integrated HRIS. From benchmarking to operational experiments, the HRIS field is rapidly evolving on many fronts. These advances are changing how HR metrics and analytics are used in organizations and, subsequently, their impact on organization effectiveness.

Chapter Objectives

After completing this chapter, you should be able to

- Discuss why the information from numeric systems like HR metrics and workforce analytics may fail to generate value for an organization
- Discuss the roles that activities such as data mining, predictive analytics, and operational experiments play in increasing organizational effectiveness
- Discuss the differences between analytics used to assess efficiency, operational effectiveness, and organizational realignment, and offer examples of each
- Discuss why the objective of analytics efforts needs to be improving decisions and why doing so is critical to generating return on investment
- Discuss how a decision-based view of HR can be used to identify important workforce analyses that can drive improved value in almost any organization
- Describe what factors managers should consider when building workforce analytics capability in an organization

HRIS In Action

When Dan Hilbert arrived as manager of employment services at Valero Energy, he wasn't quite sure what he wanted or needed to do. Coming from a background in operations, he was used to having information about the effectiveness of all current operations, yet, as he quickly learned, these data were not available for HR operations and programs, nor were there systems in place to generate them. He recognized the potential value of having even simple descriptive statistics about the organization's people and its operations —to highlight potential opportunities and how changes in these values could signal potential problems. However, since these data were not currently available or easily developed, he created a small team, consisting of one HR staff member, who could help get access to data from the organization's current systems, and a graduate student with a statistical background, who was hired as a part-time employee. The team's assignment was to collect data about the human capital in the organization in an effort to learn more about

the organization and its people, which Dan was now charged with supporting.

The team's analysis highlighted a unique characteristic of the Valero workforce—all of its refinery managers were at least 55 years old. This meant that these managers, each with long tenure in one of the most critical positions for assuring operating success, would be eligible to retire in less than 10 years. Further, given that these managers had all joined the company at roughly the same time and had held these refinery manager positions for many years, the promotion pipeline for succession to this position was limited. In other words, promising managers who had joined the organization at lower managerial positions decided to leave the company when it was clear that upward opportunities were limited.

When Dan presented the results of this analysis and his conclusions to senior managers, they were shocked. No one had considered the issue of the aging of refinery managers, and, likely, management would not have become aware of the situation until the refinery managers began to retire. By then, it would have been too late to develop internal replacements. Interestingly, as Valero's success increased and the stock price increased, the retirement age lowered, compounding the problem. The pipeline of trained managers capable of filling these positions internally would not have been sufficient to meet the demand created by the mass retirements, and the time to train them as refinery managers was lengthy. Here, the computation of relatively simple metrics and analytics provided new insights on the retirement status of employees. These data allowed management to engage in the training and development needed to build internal bench strength for this critical position prior to these managers retiring, likely saving the refiner millions in salary expense and reduced refinery performance.

Introduction

> *I have found that the largest single difference between a great HR department and an average one is the use of metrics . . . bar none, there is nothing you can do to improve yours and your department's performance that exceeds the impact of using metrics.*

—John Sullivan (2003)

There are three kinds of lies: lies, damned lies, and statistics.

—Mark Twain

War is ninety percent information.

—Napoleon Bonaparte

Human resources (HR) metrics and workforce analytics have become a hot topic in organizations of all sizes. Interest is rising, and organizations are reaching out to learn more about useful metrics and analytics and how they can use them to improve organizational effectiveness. Although the use of HR metrics and workforce analytics is not new, various factors are driving increased interest. An important driver is the widespread implementation of integrated human resource information systems (HRIS) and the greater availability of information from third-party sources. Today's HRIS builds on the capabilities of faster and more capable computers, improved connectivity through organizational networks and the Internet, and the availability of user-friendly analytics software. These changes have fundamentally altered the dynamics of human capital assessment in organizations, driving the marginal cost of assessment lower, while providing the potential for near real-time analysis and distribution of information. These factors, combined with recent and growing interest in evidence-based management, account for the rapidly growing interest in HR metrics and workforce analytics.

A Brief History of HR Metrics and Analytics

Systematic work on the development of measures to capture the effectiveness of an organization's employees can be traced as far back as the days of scientific management (Taylor, 1911) and industrial and organizational psychology (Munsterberg, 1913). Methods of quantitative analysis and its use in decision making were developed during the build-up of both men and materiel leading up to and during World War II. Further study and

development occurred during the great post-war industrial expansion in the United States that continued into the 1970s. Many of the HR metrics used today were first considered and developed during this period (e.g., Hawk, 1967).

Widespread assessment of HR metrics did not occur until the pioneering work of Dr. Jac Fitz-enz and the early benchmarking work he conducted through the Saratoga Institute. In 1984, Fitz-enz published *How to Measure Human Resources Management,* currently in its third edition (Fitz-enz & Davidson, 2002), which is still a highly valued overview of many HR metrics and the formulas used to calculate them. A set of 30 metrics were developed through the joint efforts of the Saratoga Institute and the American Society for Personnel Administration, the forerunner of the current Society for Human Resource Management (SHRM). These metrics are listed in Table 14.1. Initially, HR metrics were primarily used to measure or audit aspects of HR programs and activities as described by Cascio (1987) and Fitz-enz and Davidson (2002). Next, metrics began to be used to measure HR effectiveness. SHRM has identified a number of metrics that organizations can use in this way. These metrics comprise the HR Metrics Toolbox seen in Table 14.2 (SHRM, 2010). For example, cost per hire can be calculated as cost per hire equals the sum of external costs (recruiting) and internal costs (training new employees) divided by the total number of starts in a time period (SHRM, 2010). There are also more detailed approaches for the measuring and benchmarking of employees' behaviors such as turnover (Cascio, 2000), as well as for creating HR metrics for programs such as employee assistance and work-life programs (Cascio, 2000).

TABLE 14.1 ■ Measures in the Saratoga Institute/SHRM Human Resources Effectiveness Report

Revenue per Employee
Expense per Employee
Compensation as a Percentage of Revenue
Compensation as a Percentage of Expense
Benefit Cost as a Percentage of Revenue
Benefit Cost as a Percentage of Expense
Benefit Cost as a Percentage of Compensation
Retiree Benefit Cost per Retiree
Retiree Benefit Cost as a Percentage of Expense
Hires as a Percentage of Total Employees
Cost of Hire
Time to Fill Jobs
Time to Start Jobs
HR Department Expense as a Percentage of Company Expense
HR Headcount Ratio—HR Employees: Company Employees
HR Department Expense per Company Employee
Supervisory Compensation Percentage
Workers' Compensation Cost as a Percentage of Expense
Workers' Compensation Cost per Employee
Workers' Compensation Cost per Claim
Absence Rate
Involuntary Separation
Voluntary Separation
Voluntary Separation by Length of Service
Ratio of Offers Made to Acceptances

Source: Adapted from Fitz-enz (1995).

Source: Adapted from Fitz-enz (1995).

TABLE 14.2 ■ HR Metrics Toolkit

HR Metrics		
Absence rate	[(No. of days absent in mo.) / [(Ave. no. of employees during mo.) × (No. of workdays)]] × 100	Measures absenteeism. Determines if your company has an absenteeism problem. Analyzes why and how to address the issue. Analyzes further for effectiveness of attendance policy and effectiveness of management in applying policy. See Hollmann (2002).
Cost per hire	(Advertising + Agency fees + Employee referrals + Travel cost of applicants and staff + Relocation costs + Recruiter pay and benefits) / No. of hires	Costs involved with a new hire. Use *EMA/Cost per Hire Staffing Metrics Survey* as a benchmark for your organization (Klutz, 2003). Can be used as a measurement to show any substantial improvements to savings in recruitment/retention costs. Determines what your recruiting function can do to increase savings/reduce costs, etc.
Health care costs per employee	Total cost of health care / Total employees	Per capita cost of employee benefits. Indicates cost of health care per employee. For benefit data from the Bureau of Labor Statistics (BLS). See *Employer Costs for Employee Compensation and Measuring Trends in the Structure and Levels of Employer Costs for Employee Compensation* (BLS, 2010) for additional information on this topic.
HR expense factor	HR expense / Total operating expense	HR expenses in relation to the total operating expenses of the organization. In addition, determines if expenditures exceeded, met, or fell below budget. Analyzes HR practices that contributed to savings, if any.
Human capital ROI	(Revenue – [Operating expense – (Compensation cost + Benefit cost)]) / (Compensation cost + Benefit cost)	ROI ratio for employees. Did organization get a return on its investment? Analyzes causes of positive/negative ROI metric. Uses analysis as an opportunity to optimize investment with HR practices such as recruitment, motivation, training, and development. Evaluates if HR practices have a causal relationship in positive changes to improving metric.
Human capital value added	(Revenue – [Operating Expense – (Compensation cost + Benefit Cost)]) / Total no. of FTE	Value of workforce's knowledge, skill, and performance. This measurement illustrates how employees add value to an organization.
Prorating merit increases	(No. of mos. actually worked / No. of mos. under the current increase policy) × Increase in percentage the person would otherwise be entitled to	The basic steps to calculate an employees' pay increase appropriate to the period of time worked.
Revenue factor	Revenue / Total no. of FTE	Benchmark to indicate effectiveness of company and to show employees as capital rather than as an expense. Human capital can be viewed as an investment.
Time to fill	Total days elapsed to fill requisitions / No. hired	Number of days from which job requisition was approved to new hire start date. How efficient/productive is recruiting function? This is also a process measurement. See *EMA/Cost per Hire Staffing Metrics Survey* for more information.
Training investment factor	Total training cost / Headcount	Training cost per employee. Analyzes training function further for effectiveness of training (e.g., Has productivity increased as a result of acquiring new skills and knowledge? Have accidents decreased?). If not, evaluate the causes.
Training (ROI)	[Total benefit – Total costs] × 100	The total financial gain/benefit an organization realizes from a particular training program less the total direct and indirect costs incurred to develop, produce, and deliver the training program (see white paper *Four Steps to Computing Training ROI* [Lilly, 2001] for more information on this topic).
Turnover costs	Total of the costs of separation + Vacancy + Replacement + Training	The separation, vacancy, replacement, and training costs resulting from employee turnover. This formula can be used to calculate the turnover cost for one position, a class code, a division, or the entire organization. Exit interviews (Drake & Robb, 2002) are a useful tool in determining why employees are leaving your organization (see white paper *Employee Turnover Hurts Small and Large Company Profitability* [Galbreath, 2000] for more information on this topic). Implements retention efforts. Evaluates if HR practices are having a causal relationship in positive changes to improving cost of turnover.
Turnover rate (monthly)	[No. of separations during mo. / Avg. no. of employees during mo.] × 100	Calculates and compares metric with national average, using business and legal reports at www.bls.gov/jlt/home.htm. This measures the rate at which employees leave a company. Is there a trend? Has metric increased/decreased? Analyzes what has caused increase/decrease to metric. Determines what an organization can do to improve retention efforts. Evaluates if HR practices have a causal relationship in positive changes to improving metric. (See white paper titled *Employee Turnover: Analyzing Employee Movement Out of the Organization* [Ofsanko & Napier, 1990].)
Turnover rate (annual)	[(No. of employees exiting the job / Avg. actual no. of employees during the period) × 12] / No. of mos. in period	Calculates and compares metric with national average, using business and legal reports at www.bls.gov/jlt/home.htm. This measures the rate at which employees leave a company. Is there a trend? Has metric increased/decreased? Analyze what has caused increase/decrease to metric. Determines what organization can do to improve retention efforts. Evaluates if HR practices have a causal relationship in positive changes to improving metric. (See white paper titled *Employee Turnover: Analyzing Employee Movement Out of the Organization* [Ofsanko & Napier, 1990].)
Vacancy costs	Total of the costs of temporary workers + Independent contractors + Other outsourcing + Overtime – Wages and benefits not paid for vacant position(s)	The cost of having work completed that would have been performed by the former employee or employees less the wages and benefits that would have been paid to the vacant position(s). This formula may be used to calculate the vacancy cost for one position, a group, a division, or the entire organization.
Vacancy rate	(Total no. of vacant positions as of today / Total no. of positions as of today) × 100	Measures the organization's vacancy rates resulting from employee turnover. This formula can be used to calculate the vacancy rate for one position, a class code, a division, or the entire organization.
Workers' compensation cost per employee	Total WC cost for year/ Average no. of employees	Analyzes and compares (e.g., Year 1 to Year 2, etc.) on a regular basis. You can also analyze workers' compensation further to determine trends in types of injuries, injuries by department, jobs, and so forth. HR practices such as safety training, disability management, and incentives can reduce costs. Use metric as benchmark to show causal relationship between HR practices and reduced workers' compensation costs.
Workers' compensation incident rate	(No. of injuries and/or illnesses per 100 FTE / Total hours worked by all employees during the calendar year) × 200,000	The "incident rate" is the number of injuries and/or illnesses per 100 full-time workers. 200,000 is the base for 100 FTE workers (working 40 hours/week, 50 weeks/year). The calculated rate can be modified depending on the nature of the injuries and/or illnesses. For example, if you wished to determine the lost workday case rate, you would include only the cases that involved days away from work.
Workers' compensation severity rate	(No. of days away from work per 100 FTE / Total hours worked by all employees during the calendar year) × 200,000	The "severity rate" is the number of days away from work per 100 FTE. To calculate the severity rate, replace the number of injuries and/or illnesses per 100 FTE from the incident rate calculation with the number of days away from work per 100 FTE. More information is available regarding the types of injuries, incident rates, and comparison with other SIC codes at www.bls.gov/iif/oshdef.htm#incidence.
Yield ratio	Percentage of applicants from a recruitment source that make it to the next stage of the selection process (e.g., 100 resumes received, 50 found acceptable = 50% yield)	A comparison of the number of applicants at one stage of the recruiting process with the number at the next stage. [*Note:* Success ratio is the proportion of selected applicants who are later judged as being successful on the job.]

Source: Adapted from Fitz-Enz, J. (1999).

Source: Adapted from Fitz-Enz, J. (1995).

Kaplan and Norton's (1996) introduction of the balanced scorecard (see Chapter 8) further refined managers' thinking about metrics. The balanced scorecard recognizes the limitations of organizations' heavy reliance on financial indicators of performance. Such measures focus on what has already happened rather than providing managers information about what *will* happen. Balanced scorecards focus on developing leading indicators of performance from several important perspectives, including customer satisfaction, process effectiveness, and employee development, as well as financial performance. In addition, the thinking required to develop balanced scorecards help managers identify causal sequences believed to lead to critical organizational outcomes.

About the same time, Huselid's (1995) work on high-performance work systems demonstrated that the systematic management of human resources was associated with significant differences in organizational effectiveness. This work provided evidence that human resource management did indeed have strategic potential. Becker, Huselid, and Ulrich (2001) helped bring these ideas together in the HR scorecard, which highlights how the alignment of HR activities with both corporate strategy and activity improve organizational outcomes.

Limitations of Historical Metrics

Unfortunately, while the computing, communications, and software infrastructure supporting HR metrics and analytics has undergone dramatic change since the late 1990s, the metrics themselves have not. Current computing operations are capable of capturing data on a wide range of electronically supported HR processes, extracting, analyzing, and then distributing that information in real time to managers throughout the organization. However, currently popular HR metrics were developed before current computing infrastructures existed. As a result, the metrics organizations utilized were primarily a function of what data most organizations could easily and inexpensively gather. A quick perusal of the metrics listed in Table 14.1 highlights the early emphasis on readily available

data, most of which came from accounting systems.

Consequently, these metrics emphasize costs or easily calculated counts (e.g., head count, turnover) that often serve as proxies for costs. Every managerial decision, though, has cost and benefits consequences, whether we recognize them or not. As a result, when metrics and analytics systems only provide information about costs, they are of limited value to managers. If managers are only provided information about costs, with little or no information about benefits, costs are likely to become the primary driver of managerial decisions. This perpetuates the still common perception of HR as a "cost center." Thus, information on benefits from a managerial decision must also be known in order to conduct an estimated return on investment (ROI) for the decision.

Second, early metrics efforts often aggregate data to the level of the organization. As such, they offer limited information that could be used to identify and diagnose within-organization differences. Organizational turnover rates, for example, are heavily influenced by the turnover rate in the organization's dominant job category, masking particularly high or low turnover rates for jobs with fewer incumbents.

Finally, early efforts only provided data after events had occurred. These "feedback" metrics result in slow responses to problems or opportunities. Feedback metrics can be effectively used to signal problems, but they are suboptimal as a primary source of data because they do not support real-time remedial action to minimize any negative effects.

Contemporary HR Metrics and Workforce Analytics

Understanding Workforce Analytics Practices

Workforce analytics has become an umbrella term that encompasses a wide range of activities and processes that are expanding and evolving. Examples of the most practices in workforce analytics are introduced in the paragraphs that follow:

HR Metrics

HR metrics are data (numbers) that reflect some descriptive detail about given processes or outcomes, for example, success in recruiting new employees. In the domain of human resources, these often reflect attributes of the organization's HR programs and activities, or related outcomes, such as the number of applicants attracted, turnover rate, headcount, or the cost of conducting training programs.

Workforce Analytics

Workforce analytics refer to strategies for combining data elements into metrics and for examining changes in metrics or the magnitude of relationships among them. Such analyses can inform managers about the current or changing state of human capital in an organization in ways that impact their decisions. Understanding what opportunities and problems managers face can suggest relevant analyses that can support better decisions. These analyses then determine what metrics the organization needs, what data elements are relevant and need to be captured, and how these data elements should be combined.

Benchmarking

Benchmarking is a method of creating useful comparisons. The Saratoga Institute was the first systematic effort to develop information on standard HR metrics to inform management about human capital. Benchmarking data is useful in that it provides insights into an organization's relative standing or insight into levels of outcomes that might be possible. However, a challenge in using HR metrics for benchmarking is that an organization's human resource practices and the use of its HR staff reflect current challenges facing that organization. As a result, most organizations have an HR department, but the specific functions performed by these departments vary widely across organizations. Consequently, direct comparisons of external HR benchmarking data to one's own organization may not provide realistic evidence of relative standing nor provide guidelines for either goal setting or forecasting the potential effectiveness of the remedial actions an organization

might undertake.

Data Mining and Big Data

Interest in mining human capital data has been on the rise since the implementation of integrated HRIS and digitized HRM processes. **Data mining** refers to efforts to identify patterns that exist within data and that may identify unrecognized causal mechanisms that can be used to enhance decision making. To identify these causal mechanisms, data mining uses correlation and multiple regression methods to identify patterns of relationships in extremely large datasets. An example would be the identification of a correlation between employee job satisfaction and employee turnover. Data mining has a number of important applications, but the caveat with its use is that it can also uncover spurious or nonsensical relationships (e.g., older employees have longer tenures; taller employees make better leaders).

Current interest in Big Data reflects efforts to analyze the extremely large datasets created by many transaction systems. Often these datasets can be many terabytes (2^{10} gigabytes) or more. Many Web-based applications and transaction sites, like those generated by Amazon.com, Google, and many social media sites generate large numbers of transactions. Mining these very large data sets can uncover patterns that provide additional insights for managers about customer preferences or process characteristics that managers can use to drive greater sales, increase customer satisfaction, and reduce costs. In many cases, this process involves analyses of quantitative data as well as qualitative analysis of unformatted text.

Big Data is often seen as valuable because it offers volume, variety, and velocity. It offers volume because it provides large amounts of data on which analyses can be based. In most cases, data sets as large as several hundred or thousand instances are sufficient to identify useful trends, although there are instances where very large volumes of data may permit additional insights. Big Data offers variety through access to a wider range of data elements. New insights may be generated by incorporating new types of data into analyses that were previously not available to the organization. A caution here, though, is that organizations have a tendency to conduct these analyses

independent of the existing data that managers currently use to make decisions. Social media, for instance, can be mined to identify characteristics of applicants who may be high performers, but the more important question is whether these data provide incremental validity for selecting employees beyond the practices organizations are currently using to make hiring decisions. Velocity refers to the speed at which data can be generated. Velocity is the Big Data characteristic most likely to consistently create value for organizations. With respect to Big Data, velocity refers to how quickly organizations can generate data on which to conduct analyses—shortening decision cycles.

Predictive Analyses

Predictive analysis is the goal of many metrics and analytics efforts. Predictive analysis involves the creation of models of organizational systems that can be used to (a) predict future outcomes, (b) estimate the effect of changes in environmental influences, or (c) estimate the consequences of proposed interventions. If, for example, the organization discovered a correlation between employee job satisfaction and turnover, HR could use these data to begin to suggest modifications to the employees' work situation that might yield increases in job satisfaction as a means of reducing turnover. Predictive models could then estimate the potential effects of these interventions, leading to more effective estimates of effects. Efforts to develop balanced scorecards are examples of elementary predictive systems. They involve identifying leading indicators of important organizational outcomes and the nature of the influences and processes expected to determine those outcomes. Engaging in efforts to test the assumptions in these models over time can lead to enhancements in the quality of the models' underlying predictive analyses, either by identifying additional leading indicators or by better specifying the nature of the relationships between predictors and outcomes.

Operational Experiments

The evidence-based management movement argues that managers should base their decisions on data drawn from the organization and evidence about

the actual functioning of its systems, in lieu of personal philosophies or untested models and assumptions about "how things work." One of the most effective methods for developing the evidence on which to base decisions is through **operational experiments** conducted within the organization. Ayres (2007) describes how Google uses operational experiments to test the effectiveness of the ad words used on its website. Rather than simply relying on intuition or "expert judgment" about which ad wording is more effective, it creates an experiment. It configures its site to alternate the presentation of competing ad text to visitors to its site and then tracks the number of "click-throughs" on the ad for a period of time. Given the large number of daily hits, Google can get objective data on the effectiveness of the various ads in a relatively short time and then adopt the ad wording demonstrated to be most effective.

Workforce Modeling

Workforce modeling attempts to understand how an organization's human capital needs would change as a function of some expected change in the organization's environment. This change may be a shift in the demand for the organization's product, entry into a new market, divestiture of one of the organization's businesses, or a pending acquisition of or merger with another organization. This process builds on and enhances a human resource planning (HRP) program, which is covered in more detail in Chapter 9.

HR Metrics, Workforce Analytics, and Organizational Effectiveness

Changes in the data available to organizations allow them to take advantage of today's more capable assessment infrastructures. However, despite reporting more metrics with greater frequency to a wider group of managers, many HR professionals who generate HR reports question whether these efforts have had a significant impact on organization effectiveness. Often, these individuals report frustration with their inability to get managers to (a) tell them what information they need, (b) read or use the HR metrics data included in existing reports, or (c) even acknowledge receipt of the reports. These perceptions point to fundamental challenges and opportunities to

improve the impact of workforce analytics efforts.

A Common and Troublesome View

Many managers perceive the increased interest in metrics and analytics as simply a mandate to compute and report more metrics. The assumption behind this perception is that assessing and reporting HR metrics results in better organizational performance. But it is not clear that generating and reporting more HR metrics will necessarily result in better individual, unit, or organizational performance. In fact, these links are not well established.

Further, a common misperception is that the objective of workforce analytics is to extract value from HR data. In this approach, the process starts with the HR data and the objective is to use that data to create metrics. These metrics can then be combined in various analyses that can then be reported to managers who use the information in these analyses to drive decision making. This view was dominant in the development of many metrics and analytics over the last decade. However, the problem with this approach is that it is not clear, from just looking at the data, which data elements are relevant, and there is no basis for guiding how they should be combined into metrics, or how those metrics should contribute to analytics. These approaches have two common and predictable outcomes. First, individuals tasked with developing and reporting HR metrics in organizations struggle to determine which metrics to report and how those metrics should be calculated. Second, as a result of the first outcome, these organizations subsequently report large numbers of metrics—because there is no a priori basis for choosing which are likely to be more useful—and the vast majority of these metrics ultimately have little or no impact on decision making and, therefore, offer no return to the organization.

A more effective approach is to start with the problems or opportunities faced by the organization and develop an understanding of what information is likely to be useful to support managers' decisions. An understanding of the problem to be addressed permits organizations to determine effectively the analysis that is most likely to be useful for improving decision making and organizational effectiveness. These analyses then determine which metrics are needed, which specific data elements are needed for those metrics, and

how the data elements need to be combined to create the metrics. The differences between “data first” versus “problem first” approaches is dramatic. The latter is more focused; analyses are targeted at specific managerial decisions, increasing the likelihood that the analysis will impact decision making while simultaneously reducing costs because fewer metrics need to be calculated and reported.

Maximizing the Impact of Workforce Analytics Efforts

An emphasis on improving managerial decisions changes the dynamics driving analytics efforts; that is, it raises the bar. It is not simply good enough to “do” metrics and analytics. These activities need to be approached in a way that increases the possibility that access to the information from these efforts will change managerial decisions, making them more effective. A fundamental problem is that many of the currently popular HR metrics do not provide a clear impact on important managerial decisions. More effective workforce analytics efforts are those that attend to both the potential contributions and costs of analyses.

Each workforce analysis effort has a potential return on investment; therefore, those individuals in organizations responsible for managing workforce analytics efforts need to recognize and attend to the potential return on investment dynamics of workforce analytics efforts. The challenge is to identify the analyses that provide managers with the information they need to make better decisions regarding the acquisition and deployment of an organization’s human capital.

HR metrics and workforce analytics comprise an information system, and information systems can only have an impact on organizations if, as a result of the information they receive, managers make different and better decisions than they would have without that information. No information system, including HR metrics and analytics, generates any return on the investment unless managers change their decision behavior for the better. It is not simply good enough for analyses to confirm decisions that managers were already going to make. Although managers may feel better, the organization is no

better off than would have been otherwise. If managers do not make different and better decisions as a result of the information reported to them, the time and effort expended in conducting and reporting HR metrics and analytics is wasted.

If managers must make different or better decisions, it is useful to examine how this might occur. Decisions can be different in three ways. First, and most common, managers can make a different (and better) decision than the one they would have made before they received the results of the analysis. Second, managers can improve decision making by making the same decision they would have made before receiving the information, but they can make that decision sooner. Making the decision sooner can accentuate the benefits to the organization. Third, managers can improve decision making by not making a new decision when one is not required. In some instances, managers can misinterpret data, confusing random variability with systematic changes, and conclude a change in practice is needed, when in fact it is not. Intervening when a system is under control generally results in a reduction, rather than an enhancement, of outcomes. The use of control charts is a good example of a decision support tool that can help managers recognize earlier when a process is heading out of control, allowing them to intervene sooner, but which also helps managers differentiate between normal variation in outcomes that are inherent in a process and systematic change in the system that requires intervention.

Triage in Evaluating Workforce Analysis Opportunities

There are many ways that workforce analytics can be focused in organizations. However, it is important to recognize that while many analyses may require roughly the same amount of analyst time and effort, not all opportunities to apply workforce analytics in an organization offer the same potential return on investment. In fact, the potential returns to investments in workforce analyses can vary dramatically. In large organizations that are just introducing workforce analysis, there are likely to be many analysis opportunities that can generate returns of hundreds or thousands of dollars. But there will opportunities that can return hundreds of thousands or millions

of dollars for the same analyst effort. Organizations that want to generate greater impact from their investments in analytics, need to develop the capacity and discipline to recognize large analytics opportunities and focus their analysis there.

So Where Are the Best Workforce Analytics Opportunities Likely to Be Found?

One approach to isolating better opportunities is to focus on the right workforce analytics domains. Broadly, workforce analytics efforts fit in one of three categories: HR process efficiency, operational effectiveness, and strategic realignment. Each represents a separate domain in which organizations can and do conduct workforce analytics.

HR Process Efficiency

Currently, a substantial amount of workforce analysis and reporting addresses HR **administrative process efficiency.** These metrics focus on how well the HR department (and/or the broader organization) accomplishes critical HRM processes that support organizational effectiveness. Metrics in this area might include cost per hire, days to fill positions, percentage of performance reviews completed on time, and HR department costs as a percentage of total costs or as a percentage of sales. In many cases, base-level proficiency in HR process efficiency analytics is viewed as necessary to create credibility for HRM managers within an organization. However, in many cases, how well HR processes are executed has only limited potential to impact organization effectiveness. How well HR processes are executed is important, but often less critical than ensuring that the organization has the right processes in place to support the organization’s objectives.

Operational Effectiveness

Operational effectiveness analyses focus on organizational process improvement. Here, the objective is to identify opportunities to improve operational outcomes through improved human capital interventions. Often

this requires analysts to utilize the technical competence of the HR professionals. For example, this could include using analyses to help managers determine whether changes to recruiting, selection, employee deployment, training, job design, employee motivation or engagement, development, or retention could help managers more effectively accomplish their objectives. These outcomes are outside of HR; they are the business units' operational metrics (e.g., percentage of on-time deliveries, operational downtime, lost time accidents, units sold, or cost per unit). Analysts in these instances play a consultative role in helping identify opportunities to use HR interventions to improve the operational effectiveness of other units of the organization,

Strategic Realignment

Strategic realignment involves the set of activities most commonly known today as human resource planning (HRP; for more detail, see Chapter 9). These planning efforts focus on both long-term plans to ensure replacement of the labor power needed to operate as an organization as well as planning for needed strategic changes in the organization. Boeing, for example, engages in a number of efforts to ensure that it will have sufficient numbers of engineers available to staff operations in future years, as the company faces the approaching retirement of a large portion of its engineering workforce. Strategic realignment also extends the use of HRM analytics to planning for new situations and circumstances. New situations and circumstances occur when an organization undergoes a strategic change in direction, such as through merger, acquisition, divestiture, or entry into new geographic or product markets. The ability of the HR department to estimate the future demand for and supply of needed human capital is largely driven by changes in organizational strategy, and this ability to forecast these future needs is crucial to the survival of the organization.

In sum, all three areas of expertise are important, but the emphasis of workforce analytics in organizations is shifting from HR process efficiency to operational effectiveness and with that shift, organizations increase the potential impact of workforce analysis on organizational outcomes. HR managers must first be able to demonstrate their capacity to use metrics and analytics to manage their own operations well, and only then will others be

more likely to listen to their recommendations. HR managers and professionals must also work closely with their business partners in operational departments to help improve their capability to achieve their desired outcomes. Using workforce analytics to improve strategic realignment is less developed in most organizations than analyses in the other two domains, but ultimately these analyses, when done well, may have the greatest potential effect on an organization's bottom line.

Starting With the End in Mind

A key to generating impactful workforce analyses is to begin by identifying big problems or opportunities. An effective approach to surfacing potential problems is to identify, either through existing data or discussions with managers, those areas of greatest challenge or opportunity in the organization. Once these areas of opportunity are identified, the next step is to identify the organizational outcome associated with that opportunity; understanding what outcome variable would change if the organization was to solve the problem or capture the opportunity. Example outcome variables might be sales, levels of scrap, on-time shipments, and so on. The second step is to represent that outcome using numbers. This set will be easier if the organization has existing metrics. If not, raw data may need to be collected and the appropriate metric combining that data may need to be developed. Third, if possible, we would like to attach dollar values to differences in the values of these outcomes. Sales are already in a dollar metric, but the value of on-time shipments may require some additional thinking to develop an understanding of how it impacts revenue or costs.

These data are critical when triaging analytic opportunities. Triage is the process of examining available analytics opportunities to determine which should receive priority. By examining data on the level and distribution of existing outcome data, it is possible to identify where there may be opportunities to raise the average outcome (and by how much) or shift the distribution of outcomes (e.g., eliminate low outliers) and from these data estimate how much the organization might gain from tackling each analytics opportunity. It is important to remember that many workforce analytics projects will likely consume roughly the same amount of analyst time. But the potential differences in benefits will differ dramatically across potential

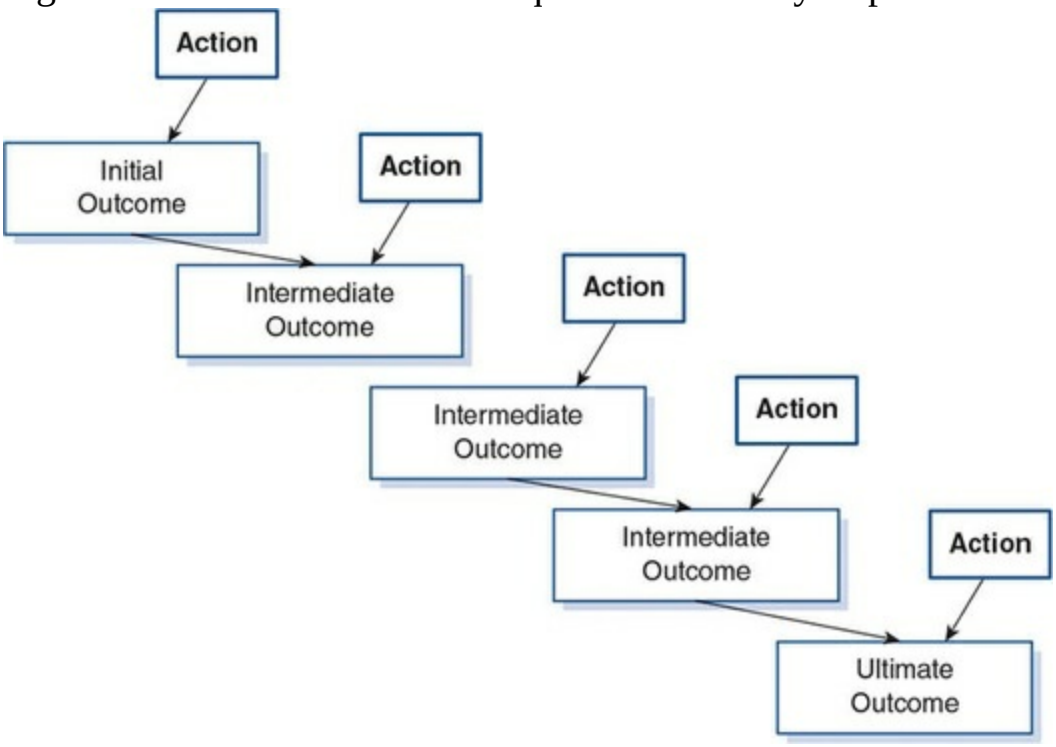
projects. Thus, the potential benefits, rather than the likely cost of conducting the analysis, is likely to be more critical in triage decisions. Organizations should encourage analysts to spend their time on projects with very large opportunities. This is also important because not every analysis will completely solve the problem. But capturing only half of the value from a $5 million opportunity will still substantively benefit an organization.

Once an analyst understands the important outcomes, the focus then shifts to (1) understanding the factors that influence those outcomes, and (2) identifying available intervention options and their costs. The system of factors that influence outcomes of interest (e.g., a downturn in the economy on sales) and the types of available interventions and their effects (e.g., changing a sales incentive system) are not always well understood in organizations. Many organizational systems have multiple sources of influence, and many organizational processes are actually sequential systems of intermediate outcomes. Each outcome may be subject to a number of influences and each outcome is likely the result of a process into which managers can intervene. These sequential processes can often be depicted as shown in Figure 14.1. Here interventions or influences in early outcomes create new starting points for downstream processes, which can be further impacted by subsequent influences and decisions. In many cases, it is often useful to determine whether a chosen outcome is an intermediate outcome, or the ultimate outcome of a process. A quick test is to ask yourself why you care about this outcome. If the answer is that it directly leads to increases in revenue, reductions in cost, or some combination thereof, you may have an ultimate outcome. If not, it is important that the analyst continue to ask *why* questions until the ultimate outcome can be identified.

This process is particularly important in workforce analytics because human resource interventions (i.e., changes in practice) almost never directly change an ultimate outcome. In most cases, the objective of the intervention is to cause some change in employee behavior (i.e., their actions and/or decisions) that impact an outcome, which many sequentially influence one or more additional intermediate outcomes before impacting the ultimate outcome. An important challenge to human resource managers and business partners is to attempt to understand these sequences. Frequently, the exact sequence of expected effects of many human resource management interventions is not

known. This can lead to the following caricature of human resource interventions: We engage in Intervention X, which will improve intermediate outcome Y, and “then a miracle occurs” and we become more profitable. Limits in this understanding can lead to incorrect decisions about appropriate interventions and can result in managers not getting the outcomes they expect. In those instances, analysts should work with managers to surface the assumptions associated with the causal sequences expected from interventions so that the validity of these hypotheses can be tested.

Figure 14.1 Action–Outcome Sequence to Identify Important HR Metrics



An Example Analysis: The Case of Staffing

Up to this point, the chapter has focused on the role of metrics and workforce analytics to support HR and employee-related decisions. In addition, it discusses how to best develop them and where they can most effectively support the organization. At this point in the chapter, we focus on a specific context in which metrics and analytics can be applied, walking the reader through an example of their use in support of the staffing function.

Carlson and Connerley (2003) discuss how staffing can be framed as a

sequence of decisions, rather than a sequence of processes. Their Staffing Cycle Framework highlights a sequence of seven high-level decisions that occur in staffing every position in an organization. These decisions, listed in Table 14.3, cover the time period from the initial intent of individuals and organizations to enter into employment relationships, through the matching processes associated with making and accepting job offers, to the decision by individuals or organizations to end these employment relationships. In staffing, these decisions are not seen as joint hiring decisions, but as a sequence of decisions in which control shifts between job seekers and the organization. In Table 14.3, some decision events (D1, D3, D5, and D7) are controlled by job seekers, and other decision events (D2, D4, and D6) are controlled by organization decision makers. When they are not in a control of a decision, the job seeker or organization decision making acts as an influencer of those decisions.

TABLE 14.3 ■ Seven Core Decisions in the Staffing Cycle (Carlson & Connerley, 2003)

Decision Event	Description
D1	The job seeker's decision to enter the workforce (to begin actively seeking employment). In the United States, just over half of the population is a part of the workforce (employed or actively seeking employment).
D2	The organization's decision to create a position that it wants to hire an individual to fill. A key aspect of this decision is the organizations decision about how the job will be designed, compensated, incentivized, located, and supervised. In many cases, these decisions can substantially impact the success of subsequent staffing outcomes.
D3	The job seeker's decision to apply for the organization's position. In the United States, applicants must make an affirmative decision to seek a specific position within an organization. Carlson, Connerley, and Mecham (2002) argue that this decision is likely the most critical in staffing as it determines who can potentially be hired. Influencing better-quality recruits to apply increases the potential impact of the cycle (achieving a high-quality hire. If high-quality applicants do not apply, they cannot be hired, and no subsequent action in the staffing cycle can replace this lost potential value. Recruiting is efforts by the organization to influence these job seekers' decisions.
D4	The organization's decision to extend an individual a job offer. This is the domain of selection. Organizations increase value by using more valid and cost-effective selection procedures.
D5	The job seeker's decision to accept a job offer. While we can offer individuals positions, not all of them may accept them. Top candidates that fail to accept job offers represent lost value; the value of that loss is determined by the difference in the potential to contribute to the organization between the top individuals that do not accept offers and the lesser-rated candidate who eventually accepts.
D6	The organizations decision to retain an employee. Framed in the negative, this is the organization's decision to dismiss an employee, or involuntary turnover. This may happen if the organization no longer needs the position (the opposite of D2), or the individual is unable to perform in the position that is acceptable to the organization. This decision in framed in the positive to acknowledge that the organization's evaluation of the individual is ongoing throughout their employment.
D7	The job seeker's decision to remain in a position. Framed in the negative, this is a person's decision to leave a position (but not necessarily the organization), or voluntary turnover. Retention programs are efforts by organizations to influence these decisions.

Source: Adapted from Carlson, K., and Connerley, M. (2003).

Source: Adapted from Carlson, K., and Connerley, M. (2003).

This framework is useful for guiding workforce analytics efforts in staffing because it identifies key intermediate outcomes in the sequence of staffing decisions that can be evaluated and helps identify the critical component processes (and roles of the key players) in influencing these outcomes. For example, consider the outcomes of decisions D3, D4, and D5.

Evaluating Recruitment Effectiveness (D3)

D3 is the decision by job seekers to apply for a position. The outcome of that decision from the organization’s perspective is the creation of an applicant

pool. Applicant pools have attributes that can be used to determine how good the outcome of D3 is for the organization. Traditionally, this is often evaluated by examining the number of applicants attracted. Having enough applicants to ensure that the position can be filled is an important outcome of recruitment. Not only does the organization want the process to result in a hire, but it wants to hire an employee who, through her or his work, will be able to maximize value contributed to the organization. Thus, not only does the organization want to attract applicants, but it wants to attract high-quality applicants. Further, because every applicant that applies will require at least some amount of expense to process their application and candidacy, the organization does not want large numbers of low quality applicants. Table 14.4 offers an example of a workforce analysis that provides insight into the quality of recruitment outcomes for a position in an organization. This analysis includes information about the number of applicants attracted for each job requisition and an estimate of their quality (e.g., capacity to contribute in this job).

TABLE 14.4 ■ Analysis of Quality of Applicants Attracted by Requisition ID

Req ID SCORE	<10	10s	20s	30s	40s	50s	60s	70s	80s	90s	100s	110s	Total Apps
22473		37		52	73	68	27	32	21	8	1		319
23473	32	8	16	5	5	26	80	63	6				241
27453	22	7	2	4	3	23	69	30	1				161
25106	17	3	2	2	1	10	50	27	5				117
23549					1	9	19	38	29	15	3		114
27158						8	18	37	28	16	3		110
27160								32	59	19			110
32159						8	18	14	6	1	2		49
30060		9		2	1	8	11	9	4				44

These data highlight substantial differences in recruitment outcomes across requisition IDs and show that the number of applicants attracted to a job listing (requisition) may not be strongly associated with the number of high-quality applicants in the pool. For instance, Requisition 22473 resulted in the most applicants (n = 319), but generated slightly fewer high-quality applicants and substantially more low-quality applicants than requisitions

23549, 27158, or 27160. These types of data can be used to guide decisions regarding recruiting processes, particularly with respect to how organizations might alter the content of their recruiting messages and channels to alter the distribution of quality scores in future requisitions. For instance, an organization may seek to replicate the recruiting outcomes, like those for 27158, or even improve upon these results. Carlson, Connerley, and Mecham (2002) offer guidance for helping organizations that currently do not generate quality scores for all applicants to do so.

Evaluating the Effectiveness of Job Offer Decisions (D4)

D4 is the organization's decision regarding who among those who have applied will receive job offers. As noted above, the outcomes of D3 represent the starting point for D4 selection processes. Consequently, the outcomes of D3 have downstream effects on the outcomes of selection decisions. The objective of selection is to identify the applicants who will be the best performers; however, because the selection activities have costs, the objective is to optimize selection decisions in light of these costs. We know from selection research that an optimal set of selection devices can be identified for any job (though that optimal set will not guarantee perfect selection decisions). To maximize selection validity (i.e., making the most correct hiring decisions), the strategy that maximizes validity is to administer all useful selection devices to all applicants and then aggregate scores optimally across these devices. Offers should then be made first to those individuals with the highest scores.

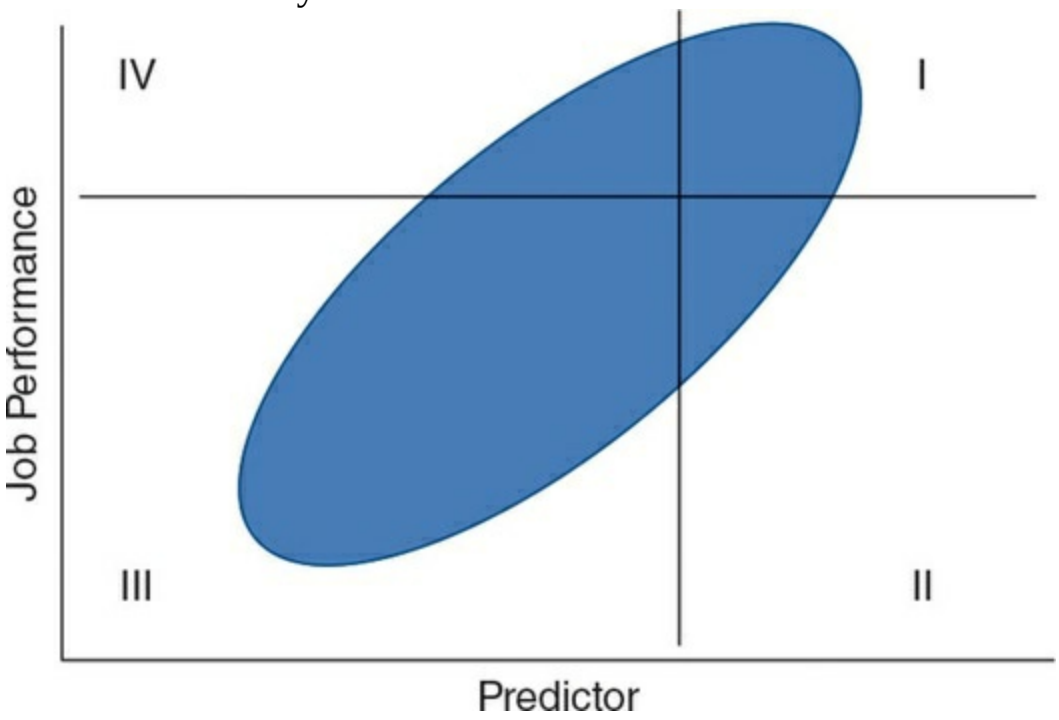
Although this approach maximizes validity, it also maximizes cost. Therefore, organizations seek methods to find an optimal combination of validity and cost. One common approach is the use of multiple hurdle selection systems. In multiple hurdle selection, organizations administer one or a few devices at a time to applicants, identify high scorers (and dismiss low scorers), then administer the next device, retain high scorers and so on until all useful devices have been used. This minimizes costs because not every device is administered to every applicant. However, validity is lost because not every device is equally valid, so individuals who score high on

some devices may not score high on others. Consequently, applicants that may ultimately be top performers get dismissed during the process. This is further exacerbated by the incentive to use lower-cost devices early in the sequence when there are lots of applicants to process. However, lower-cost selection devices also typically have lower validity, which increases the likelihood of losing high-quality applicants early in the process.

The objective of workforce analysis in support of selection decisions is to help organizations first understand and then improve the validity of their selection practices. Validity refers to the association between scores on a predictor (selection device) and future job performance. The validity of a selection practice is typically evaluated by examining how individuals' scores on the selection device (e.g., a resume review, standardized test, interview) correlate with future job performance scores. Consider. For example, a situation where the predictor and future job performance are correlated r_{xy} = .50 (Figure 14.2).

Figure 14.2 uses an oval to represent where within the plot area the greatest density of points will occur with a correlation of r_{xy} = .50. The horizontal and vertical lines divide the X and Y axes respectively into low versus high scores on the predictor and low versus high scores on the outcome, with high scores being to the right or above the lines respectively. In Figure 14.2, the intersection of these horizontal and vertical lines divides the area in the diagram in to four quadrants. Quadrant I represents people who scored high on the predictor and were hired and who were also high performers on the job. Quadrant III represents people who did not score well on the predictor and, therefore, where not hired, but would have been poor performers had they been hired. Thus, Quadrants I and III represent correct hiring decisions. Quadrant II represents individuals who scored well on predictor, but will not be high performers on the job; these are false positives. Quadrant IV represents people who do not score well on the predictor and were not hired, but had they been hired would have been high performers; these are false negatives. Both Quadrants II and IV represent hiring mistakes. The proportion of hiring mistakes here is indicated by the proportion of the area in blue that falls in Quadrants II and IV. Higher selection validity results in a tightening of the distribution of points, reducing the number of instances falling in Quadrants II and IV.

Figure 14.2 Stylized Scatter Plot Depicting the Distribution of Data Points for a Selection Processes That Has a Validity for Predicting Future Job Performance of rxy = .50



To evaluate selection device validity, the organization requires data on the correlation between applicant scores on selection devices and their future job performance. As readers may recognize, organizations are unlikely to hire all individuals in an applicant pool, so the organization will not have performance scores for all applicants. There are several imperfect solutions to this challenge. First, organizations can examine the magnitudes of relationships between predictor scores and outcomes for the data they do have (i.e., job performance for hires only). This can be a potential solution when the organization hires large numbers of individuals for a given position. Second, organizations can choose to rely on selection devices that have been developed by outside organizations for which large-scale validation studies have been conducted. Here evidence of validity generalization can be used to estimate the validity of devices for positions in a given organization. Schimdt and Hunter (1998) provide evidence of the validity of a number of common selection devices. While methods for estimating the validity of selection devices may yield imperfect results, organizations should not be dissuaded from developing the best data they can to help improve the validity of selection procedures.

Evaluating Job Acceptance Performance (D5)

Finally, organizations want to maximize acceptance rates of applicants. Job acceptance performance refers to the extent to which the organization is able to influence their preferred candidates to acceptance of job offers. In our staffing example, an outcome of D4 is a list of individuals to whom the organization is willing to make job offers. If all preferred candidates accept the offers extended, job acceptance performance is maximized. Often that is not the case. A traditional means of assessing job acceptance is through a yield ratio, the ratio of offers accepted to offers extended. For example, an organization that extends five job offers for a particular position and has three of them accepted would have a yield ratio of .60, or 60%. Organizations seek to maximize yield ratios.

A yield ratio does have limitations, though. Specifically, yield ratios assume that every job offer that is accepted and, likewise, every job offer that is declined, have the same impact on the organization. That is rarely true. Not everyone who is extended an offer is necessarily expected to produce the same on-the-job performance. Further, if the organization has a given number of positions to fill, failing to gain acceptance of an offer often means that an offer will need to be extended to the next-higher-scoring applicant pool that, by definition, is perceived to have lower potential. The difference in performance potential between the first-choice applicant and the person who eventually accepts the offer reflects the loss that occurs by not gaining an acceptance from the preferred candidate.

The magnitude of the opportunity that exists for improving job acceptance results is gauged by the number of individuals who do not accept offers and the difference in job performance potential between initial offerees and the individuals that ultimate accept positions. If an organization experiences few instances of rejected offers, or recruits sufficient numbers of highly rated applicants such that there is little difference in performance potential between original offerees and accepters, then there may not be opportunities to substantively improve job acceptance practices. On the other hand, if job acceptance results are poor and poor recruiting results in few high-scoring applicants, then improving job acceptance results may be an important opportunity for the organization.

The following example illustrates these effects. The data in Table 14.5 represent applicant scores for the top 10 applicants for a position for two different job requisitions. The three top-scoring individuals from each applicant pool will receive offers. Now consider the following scenarios. First assume that the top applicant in each pool does not accept the offer, while Candidates 2 and 3 do. In response to the nonacceptance, the organization offers the fourth best candidate, who then accepts. The amount of regret in each case can be initially scaled by the difference in applicant scores between the nonaccepting top scoring applicant and fourth best applicant who accepts. In Pool 1, the presence of several high-scoring applicants results in a modest loss of six points (i.e., [1st − 4th] 108 − 102). In Pool 2, which has the highest overall scoring applicant, the smaller number of top-scoring applicants results in a more substantial loss of 25 points (i.e., [1st − 4th] 110 − 85).

Consider the alternate scenario where job acceptance performance is worse, resulting in the first, second, and fourth best applicants not accepting offers, but the third, fifth, and sixth accepting. In Pool 1, this results in a loss of 20 points (i.e., [1st − 4th] 108 − 102 + ([2nd − 5th] 107 − 99) + ([4th − 6th] 102 − 96) = 20). However, in Pool 2, the result is a more substantial loss of 52 points (i.e., [1st − 4th] 110 − 85 + [2nd − 5th] 102 − 81 + [4th − 6th] 85 − 79).

Analyses like these can be useful for every organization. Ideally, organizations would attempt to estimate more precise value of differences in scores in dollar increments, though in many cases, this may not currently be feasible for at least some positions in every organization. But the value of working toward such estimates is easily seen in these examples, particularly when gauging the amount of investment an organization should be willing to make to intervene to capture opportunities of different magnitudes. But, even in the absence of dollar valued estimates of score differences, these analyses can be very useful. They provide guidance that is more conceptually correct than commonly used alternative metrics and score differences are directionally correct and the magnitudes have at least ordinal interpretations —bigger differences in scores represent bigger opportunities for improvement.

TABLE 14.5 ■ Job Acceptance Performance Analysis

Score Range	Pool 1 Applicant Scores	Pool 2 Applicant Scores
110–120		110
100–110	108, 107, 105, 102	102
90–100	99, 96, 95, 92, 90	93
80–90	87	85, 81
70–80		79, 76, 73
60–70		67, 65
50–60		

Assessing the Financial Impact of Staffing Decisions: Utility Analysis

Thus far, the staffing analyses that have been described examine changes in intermediate staffing outcomes, such as increases in applicant quality, increased acceptance rates of first-choice job offerees, and retention of high-performing employees. Although improving these outcomes is important, these metrics do not provide an outcome that is readily interpreted in dollars that can be directly compared to changes in costs. Estimating the contribution of better performance on intermediate outcomes to organizations can be challenging. Boudreau's (1989) discussion of utility analysis provides an initial step toward estimating the value of the greater contributions of better employees to organization effectiveness. Utility analysis requires three pieces of information. The first is an estimate of where applicants fall in the distribution of potential employee performances. The can be estimated imperfectly by the relative location of an applicant's quality score in the distribution of all applicant quality scores. The second is an estimate of how imperfect the estimate of applicant quality is likely to be. This is provided by the estimate of the validity of the selection procedure. The third piece of information is an estimate of the value of differences in job performance. Jobs that have high autonomy, where individuals have greater capacity to

determine what they will do and how it will be done, have greater potential for increasing the variability in outcome. Done really well, those decisions create the potential for high outcomes, but done poorly, there is also the potential for very poor outcomes. Low autonomy positions tend to produce more consistent results. High responsibility increases the potential impact of each decision, perhaps because it involves more dollars or impacts more people, further increasing the difference in the value of high versus low performance. These can be estimated by subject matter experts, or in the absence of these data, a rough estimate can be developed using salary data as shown below.

In utility analysis, differences in the value of better employees can be determined by estimating the difference between the location of two employees in the distribution of all employees. This can be done by calculating a standardized difference in applicant scores (i.e., $\triangle Z$ = [Score of Applicant 1 – Score of Applicant 2] / Standard deviation of applicant scores). If standardized differences are calculated, the value of these differences can be estimated if we know the difference in contribution we might expected for a one standard deviation difference in job performance. In utility analysis, this is known as the standard deviation of job performance in dollars (SD_y). This value will vary across jobs according to a number factors including the amount of autonomy and responsibility assigned to the job. In the absence of more specific information, an initial estimate of SD_y can be developed by multiplying .4 times salary. So, for a job with a salary of $50,000, this approach would yield an estimate of SD_y = $20,000. Given these inputs differences an initial rough estimate of differences in job performance could be estimated using the following formula:

$$\text{Utility} = \triangle Z * r_{xy} * SD_y$$

Therefore, for two applicants with scores of 110 and 90 for a device for which the standard deviation of applicant scores is SD = 20, a selection device with validity of r_{xy} = .50, and who are applicants for a managerial position with an annual salary of $50,000, an estimate of the difference in job performance per year would be calculated as follows:

Utility = (110 – 90)/20 * .50 * (.40* $50,000) = $10,000

Thus, when triaging selection analysis opportunities, greater opportunity comes from (a) high volume of hires, (b) low validity of current selection processes, and (c) the value of the standard deviation of performance for a given position. These data can then be evaluated in conjunction with data on the validity and cost of various alternative selection processes. Thus, workforce analytics can be used to put a tangible cost or benefit value to the hiring decision based upon the score on a selection device.

Building a Workforce Analytics Function

Getting Started

When undertaking a metrics and analytics effort, the first question the organization needs to answer is, what problems in the organization are worth solving or what opportunities for enhancing organizational effectiveness exist? Organizations are awash in opportunities for increasing effectiveness. Choosing to spend time on projects with a greater potential return to the company makes good business sense. Given that most organizations' capabilities in HR metrics and analytics may not be well developed at this point, focusing on a limited number of potentially high-payback opportunities may be the best strategy as organizations develop their workforce analytics capability.

Understanding Why

Management scholars have theories of how organizations work. Most organizational members have their own personal theories regarding how their companies work. These theories provide a framework for identifying potentially important information, focusing attention on environmental stimuli, and strengthening the capacity to identify the tactics that can be used to solve problems. However, choices for outcome measures to assess are often based on personal theories about how things work in the organization, theories that may not reflect reality. For example, company employees often

identify intermediate outcomes, such as implementation of flexible work hours (flextime) or changes in supervisors, as outcomes of interest. Intermediate outcomes are those that are more immediate indicators of things that employees believe lead to more important outcomes, for example, changes in the two previous intermediate outcomes leading to a “much happier” workplace. However, in some cases, the intermediate outcomes may not be the best ones on which to focus. This situation occurs when changes in decisions impact intermediate outcomes but do not have the expected impact on the ultimate or distal outcomes.

An important test of the appropriateness of intermediate outcomes is the *why* test. When one considers a potential outcome variable, it is useful to ask why the organization is interested in that particular outcome. If the answer is because it impacts some other variable that influences an important outcome, then care must be taken to ensure that changing the intermediate (or proximal) outcome also impacts the distal outcome. Organizational factors such as pay and working conditions that have influence through their effects on intermediate variables are reasonable targets for assessment, particularly if we understand the subsequent impact these factors have on ultimate, distal, and more important outcomes. Often, changing factors such as pay and working conditions will impact intermediate outcomes but may not produce any effect on the ultimate outcome of company profitability. Therefore, when analyzing intermediate outcomes, it is important to determine whether the intermediate outcome is limiting the performance of the ultimate outcome.

Employee turnover of valued employees, for example, is often identified as an important organizational outcome due to the costs associated with it (Cascio, 2000). It is among the most frequently assessed and reported HR metrics in organizations. Most managers agree that excessive turnover is a significant problem. High levels of turnover are disruptive to operations and can cause organizations to lose the critical expertise and capabilities of employees that leave. The answer to *why* turnover is important is that it disrupts operations and leads to potential loss of knowledge and important skill sets. But, in many cases, it is not clear whether the departure of specific employees actually results in decreasing profits. In some cases, a departing employee is replaced by a stronger performer, which will enhance profits. At a minimum, asking why helps highlight the potential causal sequence through

which these intermediate variable effects are expected to have their influence. These analyses can highlight which metrics are likely to be more critical and provide a framework for understanding how change in these metrics should be interpreted. Building the capacity to understand the causal sequences through which interventions have their effects is an important capability for an organization's workforce analysts.

Putting HR Metrics and Analytics Data in Context

Reporting HR metrics data alone is ineffective in leading to improvement in managerial decision making. Data points representing important organizational outcomes become useful when the decision maker can attach some meaning to them. Often data will need to be placed in context. For example, knowing that an organization's turnover level for newly hired management trainees is 13% is more meaningful when it can be placed in the context of the organization's previous turnover history for this position. Is turnover rising or falling for this position, and if so, how quickly? Reporting trend information for metrics is one way to provide the context that gives meaning to the data, thus creating useful information.

Benchmarking is a second means to putting data in context. Data on metrics from other organizations in the same industry can provide information that offers insight into an organization's performance relative to its peers. However, not all companies are organized in the same way. As a result, and particularly for HR metrics, how the HRM function is structured in an organization can have a significant impact on the value of HR efficiency metrics. A department with a more centralized structure of HR functions typically has lower efficiency metrics than HR departments structured such that more of the responsibility for HR processes and activities exists in operating units. As a result, HR benchmarking data need to be considered in the context of how the organization has structured the HR function. Senior management needs to ensure that the HRM function is supporting organizational effectiveness. Then, the HR organization can be structured in order to maximize HRM effectiveness in supporting organizational objectives. HR effectiveness measures can then be maximized within the context of that structure. For these reasons, internal rather than external benchmarking will often provide more appropriate data for establishing

operational objectives for the HR efficiency benchmarks. Although external data are useful, care needs to be taken to understand how HR functions and activities are structured in the organizations providing these data.

Reporting What We Find

Reporting metrics incorporates decisions about (a) what metrics will be reported; (b) how these metrics will be packaged; and (c) how, (d) when, and (e) to whom they should be reported. Effort has focused on attempting to identify what metrics an organization should use. However, trying to identify what metrics should be reported without considering an organization's problems and opportunities misses the reasons for the metrics. How metrics should be reported focuses on depicting metrics for decision makers so that the "message" relevant to them has a greater probability of being understood.

How questions deal with choosing between distributing metrics to decision makers using or creating opportunities for decision makers to extract metrics as needed. This latter approach can be done by posting the metrics on company websites.

When questions deal with the timing and frequency of metrics reports. In some cases, reporting is currently done annually, quarterly, or monthly. Some organizations are also considering the possibility of real-time updating for some metrics.

To whom questions address who receives metrics data. To date, it is most common for metrics and analytics to be reported first to senior executives. However, there is a growing recognition that managers at lower levels of the organization may be able to make more immediate use of the information contained in these data in order to assist in tactical, operational decisions.

HR metrics and workforce analytics information can be reported in a number of ways. Generally, a combination of "push" and "pull" means of communication will work for most organizations. Push communications channels, such as e-mail, actively push information and analyses to the attention of managers. These channels are used for information that is time critical or that the manager is unaware of. **Push systems** are excellent for

getting information to decision makers. However, sending irrelevant or poorly timed information through push systems can contribute to information overload and reduce managers' sensitivity to messages. As a result, they may only skim the information sent through push systems or, even worse, not attend to it at all.

Pull systems are ways of making information available to managers so that they can access any of it at a point in time when it will be most useful for their decision making. Examples include (1) posting HR metrics and analytics analyses and reports on internal company websites, (2) offering access to searchable information repositories, or (3) providing access to analytics tools as examples. These pull methods avoid the e-mail clutter associated with push systems, but pull systems can be ineffective because managers may not know what information is available or when or where to look for the information.

How frequently data are analyzed and reported is also an important consideration. The existence of an integrated HRIS, faster computing capabilities, more effective software, and advanced internal communication systems creates the capability to analyze and report information in real time for managers. How frequently data are reported and how narrowly data are packaged are also critical to supporting effective decision making. Creating reporting cycles that are too long risks losing opportunities to make changes in operations on the basis of the reported information. Aggregating too much data from subunits to higher-level units can result in the problem of causing differences between operating units, departments, or functions to be buried in the aggregated averages for the higher unit. This information for managers' work units must be available to support decision making.

HR Dashboards

A common form of reporting HR analytics data is in the form of a dashboard. Dashboards are an enriched component of reporting. **Dashboards** reflect efforts to align real-time analysis of organizational and HR processes as well as an increased capacity to aggregate organizational data. Dashboards also contain business unit analyses to permit managers to drill down to examine metrics on several levels within the organization. The dashboard allows users

to maintain a current snapshot of key HR metrics. In discussions with individuals who construct metrics and analytics reports, we hear a common concern: These individuals wonder *whether anyone pays any attention* to the reports they produce. Often, they send reports to managers and receive no feedback of any kind. Often those who do get positive feedback are HR professionals who embed an interpretation of what the data mean for the organization and the decision maker. Reporting data in context is a key component of their success stories.

Being consultative is an important skill workforce analysts need to develop. For individuals conducting metrics and analytics work, paying attention to the capabilities and needs of the targeted audience is critically important. The information reported must be relevant to the issues facing the managers who receive it. Further, simply providing numbers to managers is unlikely to be of much use to them until they can understand the meaning of the information for their decision situations. Consequently, the HR analyst must report the numbers but also provide an interpretation of what the data mean for the manager's decision situation. Some HR analysts argue that the interpretation of analyses is the central message that needs to speak to managers, which, in turn, is then supported by the data. When packaging a metrics analysis, then, we must understand the needs of the recipients and fit the data to the information needs of the decision maker.

Useful Things to Remember About HR Metrics and Analytics

Don't "Do Metrics"

The *primary objective* of developing capabilities in HR metrics and workforce analytics is *to increase organizational effectiveness.* It is not simply to generate a static menu of HR metrics reports. Simply conducting the analysis and developing reports are activities, and activities raise costs. Developing HR metrics and workforce analytics to be used by managers and professionals must involve a return on the organization's investment. The real test of the value of HR metrics and workforce analytics is whether managers who have access to the information provided by these analyses make

different and better decisions.

Bigger Is Not Always Better

The success of any metrics and analytics project is not measured by how many people are involved, how many metrics the project tracks, or how many people receive reports. It is gauged by the impact that the project's results have on managerial decisions. Many successful efforts have been focused on small, narrowly targeted metrics and analyses that have addressed organizationally important questions.

Small metrics and analytics projects have several advantages over the multimillion-dollar implementation projects that include integrated prepackaged analytics systems. First, they cost less and require fewer resources in terms of time and materials. Second, they are less visible during the initial start-up, while the project team is learning through trial and error. These two aspects provide the project team with opportunities to focus on critical HR metrics, while giving them the flexibility to work through the necessary trials and errors.

HR Metrics and Analytics Is a Journey—Not a Destination

Because the focus is on identifying and responding to opportunities and problems, useful and effective HR metrics and workforce analytics projects change over time. Markets for both products and labor will change, as will organizational processes. These changes will require adjustments in the ideal size, skill requirements, and deployment of an organization's human capital. If organizations are successful in solving operational problems or capturing opportunities, the focus for managers naturally shifts to other problems or new opportunities. These problems are unlikely to require the same analytics and therefore may depend on identifying new metrics.

Be Willing to Learn

Organizations that have an HR metrics and analytics function will develop a bias for experimentation to try out new HR activities, programs, or processes. One consequence of organizational life is the ongoing opportunity to recognize that there may be a better way to do things than your current approach. This point is true not only for the organization's operational processes but also for its metrics and analytics efforts. The organization should develop a metrics and analytics "laboratory" where the HRM professionals can experiment with new analyses and test existing assumptions about the requirements of the organization's current systems. This examination can foster new approaches and allow new metrics and analytics to be created.

Avoid the Temptation to Measure Everything Aggressively

Not every HR function, process, or metric that can be analyzed should be. Successful efforts will focus on those things, at a given point in time, that are most likely to have the greatest impact on managerial decision making. The intensity of an assessment project should be matched to how much opportunity it offers for improvements, and the project itself should be focused on factors, processes, and functions related to those things that are likely to have the greatest impact on organization effectiveness.

Workforce Analytics and the Future

The development of useful and effective workforce analytics is likely to be viewed in the future as a very significant source of competitive advantage. We now have the tools and the computing infrastructure to handle these projects that can help us understand organizations and support effective organizational functioning. By using effective approaches to workforce analytics, decision makers will acquire the ability to more effectively manage and improve HR programs and processes as well as to improve the effectiveness of HRIS use. Using this acquired ability, managerial decision makers may be able to modify entire employment systems to manage the company's human capital more effectively. Bintliff-Ritchie (2006) notes the following managerial benefits of metrics for organizations:

- Operational reporting is more efficient and cost-effective because the data from individual applications are integrated and accessed through a single solution.
- Graphically rich information is available to the people who need to make decisions and show metric-based results.
- Human resources practices and investments can be optimized to meet enterprise performance goals.

As a result, organizations that make investments in internal human capital assessment resulting in useful HR metrics and workforce analytics will become less willing to share their knowledge with other organizations in their industry. Benchmarking, which has been a staple of HR metrics and workforce analytics for almost three decades, will become more difficult to access and develop as organizations recognize the competitive value of these capabilities.

Summary

The central focus of this chapter was to define workforce analytics and discuss how and when it can contribute to improving organizational effectiveness. Workforce analyses activities provide no return on the organization's investment unless managers make different and more effective decisions as a result of the information provided by metrics and analytics reports. Therefore, focusing the development of workforce analytics around organizationally important problems and opportunities is likely to increase the possibility of significant returns for the organization.

This chapter also highlights the wide range of activities that fall within the domain of workforce analytics. Although classic metrics still have value, new software offers tremendous opportunities to change both the metrics and types of analyses organizations undertake. We can expect the types of metrics organizations used in the future to change as the needs of decision makers change, and as these analyses continue to work toward effectively balancing the cost and benefit consequences of decisions (see Chapter 7). Components of this continued evolution of metrics and analytics capabilities are driven by increased use of both push and pull reporting systems, more extensive use of predictive analytics and operational experiments, and the development of organizational expertise in metrics and analytics capabilities. As these skills

mature, organizations will be able to move beyond simple analyses of HR efficiency metrics to a greater emphasis on operational effectiveness and organizational realignment analyses, which will further enhance the value of workforce analysis systems.

Key Terms

administrative process efficiency 402
dashboards 416
data mining 398
operational effectiveness 402
operational experiments 399
predictive analysis 398
pull systems 416
push systems 416
reporting metrics 415
strategic realignment 403
workforce modeling 399

Discussion Questions

1. What factors have led to increased organizational interest in HR metrics and workforce analytics?
2. When might the information from numeric information systems such as HR metrics and workforce analytics *not* generate any return on investment?
3. What are some of the limitations of the traditional HR metrics?
4. Discuss the historical role of HR benchmarking and its strengths and weaknesses as part of a metrics and analytics program in organizations today.
5. What roles might more recent analysis activities, such as data mining, predictive statistical analyses, and operational experiments, play in increasing organizational effectiveness?
6. What differences exist between metrics and analytics that focus on HR efficiency, operational effectiveness, and organizational realignment? Offer examples of each.
7. Describe which characteristics of HR metrics and workforce analytics

are likely to result in greater return on investment and organizational impact.

Case Study: Regional Hospital

Regional Hospital is a 500-bed hospital and several associated clinics in a major East Coast metropolitan area. It has been an aggressive adopter of computing technologies in efforts to decrease costs and improve operational efficiencies. A critical challenge facing the hospital is meeting its ongoing challenges to staff the hospital and allied clinics effectively, given the ongoing shortage of nurses; uncertainty in health care legislation; emphasis on shortening hospital stays to reduce costs, which causes the daily census (numbers of patients in various departments) to vary dramatically from day to day and shift to shift; the continued aging of the population in its primary care area; and the unending competition for employees with key skill sets. Employee expenses represent more than 80% of the overall costs of operation for the hospital, so identifying ways to match optimal skills and numbers of employees to the appropriate shifts is critical to achieving consistent success. However, individual shift managers struggle to make effective staffing decisions, resulting in consistent overstaffing or understaffing of shifts and departments. These staffing problems potentially increase the high costs of varied levels of patient care and satisfaction and potentially increase the risk that staff turnover may escalate because of dissatisfaction with the continuing inability of managers to match staffing needs to demand.

Company managers recognize the potential that HR metrics and analytics might have for their organization, and they have come to you for help. They are hearing from their peers in other hospitals that metrics can help in this area but are not quite sure where to start. They are looking for you to offer guidance on how to do HR metrics and workforce analytics.

Case Study Questions

1. Do you believe that a program of HR metrics and workforce analytics might be useful in Regional Hospital? If so, why?
2. What opportunities do you see regarding *where* and *how* metrics and

analytics might be applied in this organization?
3. Identify three analyses and associated metrics you think might be useful for Regional Hospital to consider.
4. How might Regional Hospital utilize benchmarking as a part of its metrics and analytics effort, if at all?
5. What advice would you offer to the managers at Regional Hospital about developing a program of HR metrics and workforce analytics?
6. What potential problems might occur in the establishment of an HR metrics and workforce analytics program for Regional Hospital managers about which you would want to alert them prior to beginning this project?

Student Study Site

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15 HRIS Privacy and Security

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Dianna L. Stone

Editors' Note

This chapter expands on the information security and privacy issues in HRIS described in Chapter 3 (system considerations) and Chapter 8 (HR administration). Many organizations mistakenly believe that the biggest threat to information security is from outside. This chapter explains the importance of employee information privacy, the threats to employee privacy, and the varying privacy protections afforded employees by laws. In addition, the chapter reviews information security focusing on the technical and behavioral practices of strong information security practices. It also highlights how present and past employees can pose a greater threat to employee privacy than outsiders in the light of the emergence of collaborative and convergent technologies. Finally, the chapter describes the importance, legal aspects, and best practices in maintaining and promoting safe information-handling procedures.

Chapter Objectives

After completing this chapter, you should be able to describe

- The importance of information security and privacy in today's technology- intensive and information-driven economy
- The important components of and threats to information security
- The legal requirements pertaining to information security and privacy
- Best practices in safe information-handling procedures

HRIS In Action

In 2015, almost 80 million customers of the second-largest health insurance company in the United States had their account information stolen. Anthem Incorporated's database was accessed after logon information for database administrators was compromised. The unauthorized information that was accessed included personal information about current and former members such as their names, birthdays, Social Security numbers, addresses, employment information, and income data. Since administrator-level privileges were used, additional encryption would not have prevented the attack. The system used relied solely on a simple authentication mechanism: username and password. Considering that breaches of this nature have become commonplace, and in many ways are unavoidable, the broad extent of the Anthem breach could have been avoided.

Introduction

> *We should treat personal electronic data with the same care and respect as weapons-grade plutonium—it is dangerous, long-lasting, and once it has leaked, there's no getting it back.*
>
> —Cory Doctorow

Information privacy and security are particularly important issues for human

resource information systems (HRIS) because unlike many other organizational systems, an HRIS includes a great deal of confidential data about employees, such as Social Security numbers, medical data, bank account data, salaries, domestic partner benefits, employment test scores, and performance evaluations (DeSanctis, 1986; Kovach & Cathcart, 1999). Consider the scenario above, which highlights the disadvantage of using systems that are based on what the information security industry refers to as "knowledge-based authentication": things people know—and can be stolen—such as an individual's password. In fact, majority of the Internet relies on only an e-mail and password. A solution is to use two-factor authentication, which combines "something you know" with "something you have." For example, in addition to a username and password combination, the user will need to have something with them, such as a physical token. Therefore, it is critical for organizations to understand and pay close attention to what employee data are collected, stored, manipulated, used, and distributed—when, why, and by whom. Organizations also need to carefully consider the internal and external threats to these data and develop strong information security plans and procedures to protect these data and comply with legislative mandates. The fact that Anthem did not encrypt their data at rest and only in transit is concerning in itself.

Doing this is much more complex than it was 30 years ago. Consider that most computers at that time were mainframes that were secured in a central physical location, with very few HR staff having access to them. If an HR staff member had access to the mainframe it was through "dumb" terminals with limited functionalities and access was easily restricted through physical access and passwords. Due to this closed environment, there was little threat of **security breaches** or vulnerabilities being exploited. During those days, information security was considered to be a process that was composed mostly of physical security and simple document classification schemes. Physical theft of equipment, espionage, and sabotage were considered as the primary threats. However, starting in the 1990s as computer networks became more common, threats to information security became more involved due to the presence of enterprise-wide systems.

There is a growing concern about the extent to which these systems permit users (both inside and outside of the organization) to access a wide array of

personal information about employees. As a result, employees may perceive that if these data are accessed by others, the information contained in their employment files may embarrass them or result in negative outcomes (e.g., denial of promotion or challenging job assignment). Recent research suggests that this concern may be well founded. For example, one report indicated that over 500 million organizational records have been breached since 2005, and there has been a rise in the theft of employment data (Privacy Rights Clearinghouse, 2010). For instance, in 2010, a hard drive was stolen from AMR Corporation, the parent company of American Airlines. The hard drive included names, Social Security numbers, health records, and bank account data for many current employees, retirees, and former employees. As a result, some employees and retirees experienced identity theft. Given these problems, AMR took important steps to implement information security practices to secure the confidentiality of all employee records (Privacy Rights Clearinghouse, 2010). In addition, in 2010, ADP notified its clients that tax and salary data of employees were stolen (Paglier, 2016).

In view of the growing concern about identity theft and the security of employment information in HRIS, a number of states (e.g., AK, CA, FL, HI, IL, LA, MO, NY, SC, WA) passed privacy laws requiring organizations to adopt reasonable security practices to prevent unauthorized access to personal data (Privacy Protections in State Constitutions, 2012). Despite these new laws, results of surveys revealed that 43% of businesses stated that they did not put any new security solutions in place to prevent the inadvertent release or access to employee data, and almost half did not change any internal policies to ensure that data were secure (Ponemon, 2012). The cost of these data breaches can be large. For example, the average cost of a data breach has increased to almost $4 million per firm (Ponemon, 2016). In addition, the average cost incurred for each stolen or lost record containing sensitive and confidential information has increased to $158 (Ponemon, 2016).

Software vendors such as Oracle are aware of the potential for security breaches and offer multiple security models (e.g., Standard HRIS Security and Security Groups Enabled Security) that enable an administrator to set up HRIS security specifically for an organization. This means that the software allows companies to determine the kind of data access and responsibility each employee has. For example, an HR manager will have higher privileges and

access to data than an employee in sales or even an employee in human resources. This would allow him or her to access a wide array of employee data. On the other hand, a sales manager would need limited data for each employee (e.g., performance-based records for their subordinates) and thus would have less access to employee data. As importance of HRIS privacy and security continues to grow in salience to organizations, it provides an interesting avenue for new employment opportunities. A typical entry-level HRIS analyst position now requires knowledge of implementing secure HR information systems.

Therefore, this chapter elaborates on various aspects of HRIS privacy and security. The next few sections consider (a) practices that may affect individuals' perceptions of invasion of privacy, (b) the components of information security, and (c) the implications for developing fair information management policies. After this, the chapter elaborates on some of the key security threats faced by organizations and the policies that organizations need to implement to ensure HRIS privacy and security. Before concluding, we explain contingency planning and its three components.

We discuss privacy issues first because security systems are typically designed to protect employee privacy and ensure that employment information is not subject to unauthorized access.

Employee Privacy

The **U.S. Fair Labor Standards Act of 1938** requires employers to maintain basic information on all employees including Social Security numbers, address, gender, occupation, pay, and hours worked. However, the increased use of HRIS to store these data has prompted concerns about the degree to which these systems have the potential to invade personal privacy. **Information privacy** has been defined as the "degree to which individuals have control over the collection, storage, access, and release of personal data" (E. F. Stone & Stone, 1990). Given the growing concerns about the privacy of information in HRIS, we consider some practices that may be perceived as invasive of privacy in the sections that follow. In particular, we discuss concerns about (a) unauthorized access to information, (b) unauthorized disclosure of information, (c) data accuracy issues, and (d) stigmatization of

individuals.

Unauthorized Access to Information

One reason that employees are concerned about the storage of data in an HRIS is that they fear that these systems may allow **unauthorized access** to their private information (D. L. Stone, Stone-Romero, & Lukaszewski, 2003). For example, employees may perceive that if users have access to their Social Security numbers or bank data they will experience identity theft. In fact, some reports indicate that identity theft is the primary consequence of the breach of HRIS data (Privacy Rights Clearinghouse, 2010). Similarly, if unauthorized users have access to medical data or domestic partner benefits then employees feel that they will experience embarrassment or loss of job opportunities (e.g., promotions, pay raises, challenging job assignments).

Interestingly, results of some survey research suggested that these concerns may be justifiable. For instance, one study found that 34% of companies collect and store medical and prescription drug information about employees (Society for Human Resource Management & West Group, 2000). In addition, the findings of the same study indicated that employee information is often released to insurance companies and future employers. Furthermore, even though there are laws that restrict the use of health data in the employment process (e.g., Americans with Disabilities Act [ADA], 1990; Health Insurance Portability and Accountability Act [HIPAA]) some employees have been terminated when employers discover they are using prescription drugs for hypertension, diabetes, or pain control (Personnel Policy Service, 2013). For instance, in one case, an organization established a policy requiring that employees report all drugs present in the body and prohibited the use of legal prescription drugs unless approved by a supervisor (e.g., *Roe v. Cheyenne Mountain Conference Resort,* 1997). Not surprisingly, the court ruled that requiring employees to report their legal prescription drug use was an invasion of privacy and in violation of ADA.

Some research also indicated that employees were more likely to perceive an HRIS as invasive of privacy when they were unable to control access to their personal data, and information was accessed by users outside the organization than those inside the organization (Eddy, Stone, & Stone-Romero, 1999).

Results of other research revealed that the use of an HRIS was perceived as invasive of privacy when (a) supervisors were able to access information in employee records, (b) the same data were used for employment rather than HR planning decisions, and (c) the employees did not have the ability to check the accuracy of the data before decisions were made (Eddy et al., 1999). Furthermore, findings of another study showed that employees were more likely to perceive that their privacy had been invaded when medical data were collected and stored in an HRIS, and they were required to use a Web-based HRIS to enter personal data than when they were able to reveal the data to HR professionals (Lukaszewski, Stone, & Stone-Romero, 2008).

It merits noting that HIPAA requires that medical data should be stored separately from other employment data, but some HRIS still include medical or health data in employment records. For instance, HIPAA allows a great deal of medical information to be stored in employee records (e.g., data from drug tests, Family Medical Leave Act certifications, OSHA, workers' compensation, and sick leave). Similarly, affirmative action data (e.g., race, ethnicity, gender, age, self-reported disability status), which are collected for EEO-1 reports, are not always separated from employment data in these systems. As a result, applicants and employees may be concerned that sensitive data will be accessed by decision makers and used unfairly against them in the employment process. At present, there are very few legal restrictions on access to data in an HRIS. Therefore, we believe that organizations concerned with protecting employee privacy may want to utilize sound security practices to limit the degree to which unauthorized individuals have access to employee data.

Unauthorized Disclosure of Information

Another concern about the use of HRIS is that employees may perceive that these systems allow for the **unauthorized disclosure** of information about them to others (D. L. Stone et al., 2003). For example, research by Linowes (2000) revealed that 70% of employers regularly disclose employment data to creditors, 47% give information to landlords, and 19% disclose employee data to charitable organizations. In addition, some reports indicated that organizations regularly sell data collected on recruiting websites (D. Stone, Lukaszewski, & Isenhour, 2005). Furthermore, 60% of employers do not

inform applicants or employees when they disclose information within or outside the organization (Society for Human Resource Management & West Group, 2000).

Thus, the use of an HRIS may make it much easier to disseminate personal information internally and externally to the organization, and there are currently few restrictions on the release of employee data in private sector organizations. However, the disclosure of employee data may result in negative outcomes for employees if data collected for one purpose (e.g., performance appraisals) are used for other purposes (e.g., decisions about an apartment lease or credit). As a result, employees may be understandably concerned that HRIS facilitate the unauthorized release of personal information, and we believe that organizations should develop policies that limit the unauthorized disclosure of employee information.

Data Accuracy Problems

Employees are also troubled about **data accuracy** because HRIS may contain inaccurate or outdated information about them. Not surprisingly, individuals are often unaware that data in these systems are inaccurate, and many organizations do not give them the opportunity to review or correct data stored in an HRIS. For example, studies showed that data from background checks, credit checks, or social media are often inaccurate and become permanent records in an HRIS (Society for Human Resource Management & West Group, 2000). In addition, survey results indicated that 73% of participants had errors in their background data that resulted in the loss of job opportunities (Society for Human Resource Management & West Group, 2000).

We believe that inaccurate data in HRISs are especially problematic because they may stigmatize individuals unfairly and result in denial of job outcomes (e.g., termination, loss of promotions or training opportunities). For instance, an executive at Hilton Hotels was terminated shortly after he was hired when data in his background check incorrectly noted that he had been convicted of a misdemeanor and served six months in jail (*Socorro vs. IMI Data Search and Hilton Hotels,* 2003).

Hilton hired a firm, IMI Data, to conduct the background check but did not check the accuracy of their findings. Socorro was not informed of the background check, but his managing director asked if he had ever been convicted of a crime or spent six months in jail. Socorro replied truthfully that he had not. Although the data about Socorro's conviction and jail sentence were incorrect, Hilton terminated Socorro for falsifying information on his job application. After Socorro's termination, Hilton told third parties that Socorro was fired because he lied on his application and that he was a convict who had spent six months in jail. Subsequently, he had a great deal of difficulty securing new employment because of the false and defamatory statements made by Hilton. Socorro did finally secure new employment, but at a substantially lower rate of compensation than the Hilton position.

It is clear from this example that the storage and use of inaccurate data in an HRIS may have a negative effect on both organizations and individuals. For example, when data in these systems are inaccurate organizations may make erroneous decisions regarding employees and fail to hire or promote highly qualified individuals. In addition, employees may be unfairly denied job outcomes and opportunities to experience gratifying careers. As a result, employees are likely to perceive that HRIS are invasive of privacy if the data stored in them are inaccurate or outdated.

In support of these arguments, Linowes (2000) found that 72% of private sector organizations do not allow employees to review their employment records for inaccurate data, and 24% do not give them the opportunity to correct their records. In addition, research by Stone, Lukaszewski, and Stone-Romero (2001) found that individuals were more likely to perceive that their privacy had been invaded when they were not able to check the accuracy of data in an HRIS than when they were allowed to check the accuracy of data. Thus, employee concerns about the degree to which inaccurate data may unfairly stigmatize them or affect their outcomes in organizations appear quite justified.

Stigmatization Problems

Employees are often uneasy about the use of HRIS especially when they feel that networked data may lead to them to be **stigmatized** deeply discredited in

the employment process (D. L. Stone & Stone-Romero, 1998). For example, HRIS often provide for the permanent storage of employee data (e.g., performance appraisals, credit scores, employment test scores) that are used to make employment decisions over time. For example, an employee who had a below-average performance ratings very early in his or her career may have difficulty purging these data from an HRIS, and the data may negatively affect subsequent decisions about him or her. As a result, the employee's advancement and career development opportunities may be negatively affected by data that have no bearing on his or her present-day job performance.

Use of Data in Social Network Websites

Recently, organizations have started collecting and using data about applicants and employees from social network websites (SNWs; e.g., Facebook, MySpace, Google) (Black, Johnson, Takach, & Stone, 2012; Roth, Bobko, Van Iddekinge, & Thatcher, 2012). For instance, organizations now use SNWs to collect information about job applicants' lifestyle, family background, friends, sexual orientation, religion, political affiliation, and personal interests. Estimates indicate that between 20% and 40% of employers now scan SNWs to gather data about job applicants (Framingham, 2008; Zeidner, 2007), and 75% of recruiters are currently required to do online research on applicants before making hiring decisions (Preston, 2011).

One consequence of the organizational use of SNWs data is that individuals are likely to perceive that the data in these systems will unfairly stigmatize them and result in the loss of job opportunities (D. L. Stone & Stone-Romero, 1998). For example, a recent court case (e.g., *Snyder v. Millersville University,* cited in Narisi, 2009) indicated that a student-teacher was terminated from a teaching position when a picture was posted of her on MySpace as a "drunken pirate." It merits noting that there was no evidence that she was drinking alcohol or drunk. Her students found the picture and reported it to school administrators and the university, who terminated her student teaching because they thought she would be a poor role model for the students. When she sued, the court ruled in favor of the university, indicating that she did not have the right to any free speech that might damage her employer's reputation (Narisi, 2009). As a consequence, data in SNWs may

be used without an individual's knowledge and may result in termination or loss of other employment opportunities. Although the collection of data from an SNW is not illegal, there is a growing concern that the collection of information from these sites may erroneously stigmatize employees and result in an invasion of their rights to privacy.

Lack of Privacy Protection Policies

Despite the widespread use of HRIS and growing concerns about the (a) unauthorized access, (b) unauthorized release, (c) data accuracy, and (d) use of data to stigmatize employees, many companies have not established fair information management policies to control the use and release of employee information (Linowes, 2000). For instance, a study by Linowes (2000) found that 42% of companies do not have privacy protection policies and the same number has not designated an executive-level person to be responsible for privacy and security of employment records. When no policies exist, the person in charge, whether a manager or record clerk, decides for himself or herself what and when sensitive personal information is released to others. Thus, we believe that one strategy for decreasing employees' perceptions of invasion of privacy is to develop fair information management policies with respect to the collection, storage, use, and dissemination of data in an HRIS. These policies will be discussed in greater detail in a section that follows. Prior to considering these policies, we will consider the important issue of information security and the components of information security systems in protecting employee information and privacy.

Components of Information Security

Brief Evolution of Security Models

As noted above, information security is particularly important for an HRIS because of the high degree of automation in these systems and the wealth of private employee data being stored. **Information security** has traditionally been defined as the protection afforded to an automated information system in order to attain the applicable objectives of preserving the confidentiality,

integrity, and availability (CIA) of information system resources (Stallings & Brown, 2008). However, the complexity of the networked environment in which HR data are captured, stored, and utilized means that personnel transactions and information processing are increasingly more vulnerable to security threats and risks than ever before. Therefore, the traditional CIA model of information security does not suffice. The National Security Telecommunications and Information Systems Security Committee security model, also known as the **McCumber Cube** (See Figure 15.1), provides a more detailed perspective on security.

The McCumber Cube provides a graphical representation of the architectural approach widely used in information security. The McCumber Cube is more granular than the CIA classification because it examines not only the characteristics of the information to be protected, but also the context of the information state. The cube allows an analyst to identify the information flows within an HRIS, view it for important security-relevant factors, and then map the findings to the cube. The cube has three dimensions. If extrapolated, the three dimensions of each axis become a 3 × 3 × 3 cube, with 27 cells representing areas that must be addressed to secure a modern-day information system (Whitman & Mattord, 2011). To ensure system security, each of the 27 areas must be properly addressed during the development and implementation of security processes and policies for the HRIS. The three dimensions and their attributes are categorized as follows:

- **Desired Information Goals**—Ensure that data are kept confidential, have not been manipulated, and are available to those who are authorized to access them.
    - Confidentiality ensures that private data are kept safe from unauthorized individuals. It is critical for maintaining the privacy of the employees' personal data (Wong & Thite, 2009).
    - Integrity ensures that data and programs are created and modified in a specified and authorized manner. It is important to ensure the integrity of both the data and the system.
    - Availability ensures that systems work and service is provided promptly to those who are authorized to use them.
- **State of Information**—Identify the state in which data is currently residing.

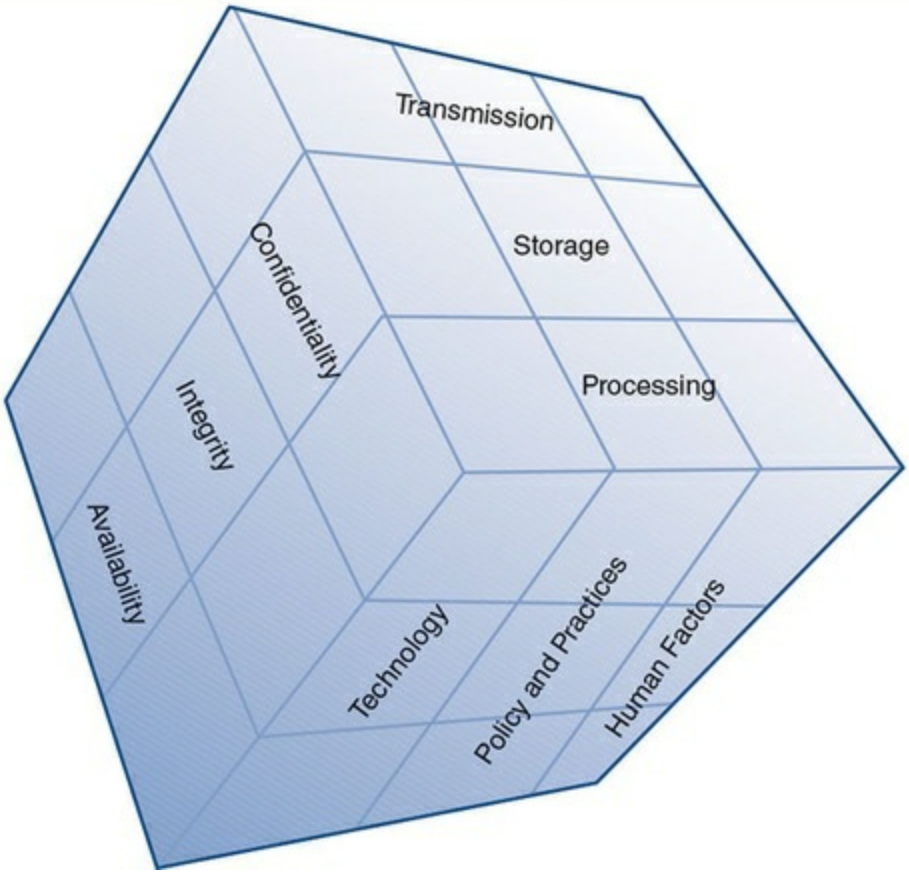
    - Storage is an inactive state of data that are waiting to be accessed.
    - Processing is a state in which data are being actively examined or modified.
    - Transmission is a state in which data are moving.
- **Countermeasures**—Identify mechanisms that can be used to protect data.
    - Technology is the use of hardware and software to limit threats to data.
    - Policy and practices is the use of procedures that mitigate risk or eliminate the possibility of threats.
    - Human factors revolve around giving each consumer of data the knowledge of how to identify and handle threats.

As an example of the use of the McCumber Cube, consider a 2005 data breach suffered by Ameriprise Financial where data from more than 200,000 clients were stolen off of an unencrypted laptop (Dash, 2006). Ameriprise needed to preempt the data needed to be encrypted (countermeasure) even when it was stored (state of information), and not just when it was being transmitted. This would have ensured confidentiality (desired information goal) of data. This is something that mirrors the issue faced by Anthem as previously mentioned. A critical point to consider is that regardless if encryption exists or not, at certain points, data may be visible and accessible. To counter these threats, HR departments need to recognize the value of data that are stored, and reasons as to why they would be valuable to a hacker. In addition to protecting data at-rest and in-motion, HR should examine and deploy techniques that augment encryption and add variability to the process. Doing this would add an additional layer of difficulty and cost for the hacker.

As another example, consider the intersection between the technology countermeasure, the integrity goal, and the storage state. In other words, how do we use technology to ensure that our stored HR data maintains its integrity? One way to do this would be to develop a system for detecting host intrusion (intrusion at the individual workstation level), which protects the integrity of information by alerting the security administrators to the potential modification of a critical file. This is very pertinent to HRIS. An HRIS specialist is asked to perform group data updates and export the results to his or her immediate supervisor for verification. The results are encrypted, and a

hash (an algorithm used to ensure that data remain secure and accurate) is computed, and then uploaded to a server via secure FTP, which only specific employees have access to. This example covers multiple cells. For example, only specific employees are allowed access to specific information (*Confidentiality*), and the data are encrypted (*Technology*) before being stored (*Storage*). Also, since a hash is computed after it is encrypted, it ensures that information may not be changed outside of proper processes (*Integrity*). Data are transmitted via secure FTP, whereby maintaining security (*Transmission*). The use of secure transmission protocols is a matter of organizational policy (*Policy*). The examples touch on only a couple of the 27 possible cells in the McCumber Cube. Organizations need to consider the implications of all dimensions and attributes in this cube when designing an HRIS to get a more detailed and accurate representation of threats faced and countermeasures that need to be implemented.

Figure 15.1 The McCumber Cube



Security Threats

What kind of threats are our organizational security practices protecting us from? In security, it is important to "know your enemy." You have to understand your vulnerabilities. If you do not know what the threat vector (attack method) is, you cannot plan to defend yourself. The following are common security threats:

- Threat Sources
  - *Human error:* When an HRIS is not well designed, developed, and maintained and employees are not adequately trained, there is a high potential threat of security breaches. Research suggests that human errors, such as incorrectly entered data or accidental destruction of existing data, constitute security threats to the availability, accessibility, and integrity of information. The Ameriprise Financial example discussed above showed that an error on the part of an employee can potentially expose private employee or customer data.
  - *Disgruntled employees and ex-employees:* One of the concerns overlooked by HR managers is that information may be damaged by **disgruntled employees**. This is commonly referred to as an insider threat. Employees and ex-employees are dangerous since they have extensive knowledge of systems, have the credentials needed to access sensitive parts of systems, often know how to avoid detection, and can benefit from the trust that usually is accorded to an organization's employees (Boyle & Panko, 2013).
  - *Other internal attackers:* Many businesses hire contract workers, who work for the organization for a short period. Contract workers usually gain temporary access to various critical areas of an organization. This creates risks almost identical to those created by employees.
  - *External hackers:* Another significant threat is the penetration of

organizational computer systems by hackers. A **hacker** is defined as someone who accesses a computer or computer network unlawfully. Such attacks, often termed “intrusions” (Austin & Darby, 2003), can be particularly dangerous because, once the hacker has successfully bypassed the network security, he or she is free to damage, manipulate, or simply steal data at will.
    - *Natural disasters:* Typical forms of natural disasters are floods, earthquakes, fires, and lightning strikes, which destroy or disrupt computing facilities and information flow. As noted earlier in the chapter, physical threats such as this were once considered the main threats to computing resources. Although they are now less visible and do not pose the daily risks that these other security threats pose, each must nonetheless be considered when developing security practices.
- Types of Threats
    - *Misuse of computer systems:* One of the predominant internal security threats is employees’ unauthorized access to or use of information, particularly when it is confidential and sensitive.
    - *Extortion:* The perpetrator tries to obtain monetary benefits or other goods by threatening to take actions that would be against the victim’s interest.
    - *Theft:* The value of information can be much higher than the price of hardware and software. With contemporary advances in technological developments, a relatively small computer chip (e.g., a USB device) can easily store over 100 GB of data. For example, the State of Hawaii’s HR department had medical records stolen when offices of two doctors servicing workers’ compensation claims were burglarized (Mangieri, 2013).
    - *Computer-based fraud:* There is growing evidence that computer-based fraud is widespread. Over 90% of companies have been affected by computer-based fraud, such as data processing or data entry routines that are modified (Garg, Curtis, & Halper, 2003).
    - *Cyber-terrorism:* **Cyber-terrorism** is the leveraging of an information system that is intended to intimidate or cause physical, real-world harm or severe disruption of a system’s infrastructure (Austin & Darby, 2003; Hinde, 2003). In one such scenario, a person with high-level computer and network skills (e.g., a hacker)

is hired to break into a specific computer or computer network to steal or delete data and information. Cyber-terrorists often send a threatening e-mail stating that they will release some confidential information, exploit a security leak, or launch an attack that could harm a company's systems or networks.
    - *Cyber-espionage:* As more and more information is available via networked technologies, cyber-espionage has come up as a legitimate threat to corporate networks. It entails the use of dangerous and offensive intelligence measures in the cyber realm.
    - *Phishing:* Victims usually receive e-mail messages that appear to come from an authentic source with which the victim does business. The official appearance of the message and the website often fool victims into giving out confidential information. According to Gartner the estimated annual cost of **phishing** is around $2 billion (Moore & Clayton, 2007).
    - *Denial-of-service:* A **denial-of-service (DoS)** attempts to make a service unavailable for legitimate users by flooding it with attach packets. The server that is hosting that service is then unable to handle the large number of requests, thereby shutting it down. The financial services sector has been hit particularly hard by this type of attack. For example, Bank of America and JP Morgan Chase have both experienced outages on their public websites due to DoS attacks (Holland, 2012).
- Software Threats
    - *Viruses:* A **computer virus** is a type of malware that works by inserting a copy of itself onto a computer or device (e.g., smartphone) and then becoming part of another program. It can attach itself to files without the user's knowledge and duplicate itself by executing infected files. When successful, a virus can alter data, erase or damage data, create a nuisance, or inflict other damage (Panko, 2003). In a period of five hours in 2000, the "I love you" e-mail virus infected millions of computers, causing damages estimated at $10 billion (Abreu, 2001).
    - *Worms:* **Worms** are in some ways similar to viruses since they can replicate themselves. However, unlike viruses that require the spreading of an infected file, worms such as Code Red, Slammer, and MyDoom can spread by themselves without attaching to files

(Panko, 2003).

- *Spyware:* **Spyware** is software installed on an unknowing user's computer that gathers information about the user's activities on the Web (keystrokes, websites visited, etc.) and transmits it to third parties such as advertisers or attackers (Stafford & Urbaczewski, 2004). Problems associated with spyware include potential privacy invasion, appropriation of personal information, and interference with the user's computer operation (Stafford & Urbaczewski, 2004).
- *Blended Threats:* These threats propagate both as viruses and worms. They can also post themselves on websites for people to download unwittingly (Boyle & Panko, 2013).
- *Trojan:* A **Trojan** is another type of malware that usually hides inside e-mail attachments or files and infects a user's computer when attachments are opened or programs are executed. Trojans are named after the Trojan horse of Greek mythology in that they appear to be something positive, but are in reality doing something malicious. Unlike viruses and worms, Trojans do not reproduce by infecting other files nor do they self-replicate. Instead, they must be opened on a computer by a user. Some Trojans can work as spyware, while others can display a login or install screen and collect personal data such as usernames and passwords, or other forms of identification, such as bank account or credit card numbers. They can also copy files, delete files, uninstall applications using remote access programs on the computers, and format disks without alerting the victim. One type of Trojan horse is a **rootkit**. A rootkit takes over a root (administrator) account, and uses its privileges to hide itself. Most rootkits find their way into a system though installation or updating of application software, such as a word-processing program. Rootkits have the capability to modify the behavior of the application so that it can escape detection and do what it was written to do. Therefore, rootkits are seldom caught by ordinary antivirus programs, and rootkit detection programs have to be designed to detect a specific rootkit.

Information Policy and Management

As you can see from the above discussion, it is important that organizations have policies and procedures in place to protect employee data. There are two mechanisms though which this can occur: fair information management policies and strong security practices. We believe, as do others (e.g., Privacy Protection Study Commission, 1977; D. L. Stone & Stone-Romero, 1998), that one way to decrease individuals' perceptions of invasion of privacy is to establish fair information management policies for controlling data in HRIS. These policies and organizational strategies for ensuring information security will be considered in the sections below.

Fair Information Management Policies

To date, there has been legislation restricting the collection, storage, use, and dissemination of employee information in the public sector (e.g., Privacy Act of 1974), but there is no comprehensive federal legislation on employee information privacy in private sector organizations. However, one state, California, has recently passed a law that protects the privacy of employee records in private sector organizations (Privacy Protection in State Constitutions, 2012). Space limitations preclude a complete review of all employment-related privacy laws, but we suggest that interested readers see the Privacy Rights Clearinghouse (2013) at www.privacyrights.org/background-checks-and-workplace for a complete review of all federal and state laws. In addition, multinational organizations should also consider the privacy practices in the countries in which they operate. The challenge for organizations is that every country takes a different perspective on protecting employee information privacy, and your organization will need to be familiar with all the applicable laws in each country in which you operate. A sample of interactional laws protecting employee privacy across the globe is found in Table 15.1.

TABLE 15.1 ■ Example Privacy Laws in Various Countries

Country	Law	Date
Angola	Da Protecção de Dados Pessoais	2011
Argentina	Personal Data Protection Act	2000
Canada	Personal Information Protection and Electronics Document Act	2000
European Union	The European Union Data Protection Directive	1998
Germany	Bundesdatenschutzgesetz	2001
Japan	Personal Information Protection Act	2003
Mexico	Ley Federal de Protección de Datos Personales en Posesión de los Particulares	2010
New Zealand	The Privacy Act	1993
South Korea	Personal Information Protection Act	2011
United Kingdom	Computer Misuse Act	1998

Even though there are few laws governing the storage, use, and dissemination of information in HRIS, organizations may decrease the degree to which employees perceive that HRIS invades their privacy by establishing fair information management policies and practices. For example, in 1977 the Privacy Protection Study Commission recommended that private sector organizations proactively establish policies for managing employee information to protect individuals' perceived or actual rights to privacy. For instance, they recommended that organizations limit the collection of information to data that are job related, control unauthorized access to information in HRIS, adopt reasonable procedures for assuring that data are accurate and timely, and limit external disclosures of data without employees' consent. A complete review of these recommendations is provided in Table 15.2.

We believe that the use of these fair information policies and practices may lessen many of the concerns that applicants and employees have about the collection, storage, use, and dissemination of data in an HRIS. However, it is imperative that all users review and clearly understand these policies before HRIS are implemented in organizations.

TABLE 15.2 ■ Fair Information Management Policies and Practices Based, in Part, on Privacy Protection Study Commission Recommendations (1977)

Organizational Practice	Policy Recommendation
Collection of Employee Data	Limit the collection of information on individual employees, applicants, and former employees to that which is relevant to jobs or specific employment decisions.
Inform Employees About Uses of Data	Inform employees, applicants, and former employees about the uses made of their information and types of records maintained.
Ensure Accuracy of Data	Adopt reasonable procedures to ensure the accuracy, timeliness, and completeness of employment information.
Allow for Correction of Data	Permit employees to see, copy, correct, and amend records maintained about them.
Unauthorized Access to Data	Limit the internal and external use of records maintained about employees, applicants, and former employees. Data are available to users on a "need to know" only basis.
Unauthorized Release of Data	Limit external disclosures of information kept on employees, applicants, and former employees. Require that employees, applicants, and former employees provide authorization for the release of personal information or requests for verification of information.
Ensure That Employees Are Aware of and Understand Fair Information Management Policies	Provide employees with training about fair information management policies to ensure they understand them. Require that employees provide written acknowledgments that they understand these policies.

Effective Information Security Policies

The second way that organizations need to protect employee data is through their security practices. Bruce Schneier (2000) once stated that "security is a process, not a product." This statement alludes to the nature of information security. That is, information security is not predominantly a technical issue; it is more of a management issue. It is easy to see why at times there is a major focus on technology. Technology is visible, and there are many things that we can say about security technologies. Management can seem more abstract. There are fewer general principles to discuss, and most of these

cannot be put into practice without well-defined and complex processes (Boyle & Panko, 2013). But the management issues are actually often complex and focused both on behavioral information policies as well as the technical practices.

This lends credence to importance of effective security policies. Security policies identify valuable assets, provide a reference to review when conflicts pertaining to security arise, outline personal responsibility, help prevent unaccounted-for events, outline incident response responsibilities, and outline an organization's response to legal, regulatory, and standards of due care.

For effective implementation of security, organizations usually follow established security standards such as **ISO/IEC 27000** series. This series focuses on areas such as access control, security management, good practices, and protection of health-related information. Almost all aspects of the ISO/IEC 27000 series mesh with HRIS. For example, it is standard practice to require HR employees to change their passwords on a quarterly basis to achieve optimal access control. It is also a generally good practice to verify that all HRIS users are properly trained in the secure use and handling of equipment, data, and software. Many breaches occur when users are not consciously aware of what they are doing. Unconscious behavior can defeat the best efforts of security experts, meaning all of the security protocols in the world are powerless in the face of a stressed-out worker. According to Microsoft's Security Intelligence report, 44.8% of vulnerabilities result from user action such as clicking a link or being tricked into installing malware (Microsoft, 2011).

Several best practices have been proposed to ensure that employee data are secured and employee privacy is protected (Canavan, 2003; David, 2002; Tansley & Watson, 2000). These include the following:

- Adopt a comprehensive information security and privacy policy.
- Store sensitive personal data in a secure HRIS and provide appropriate encryption.
- Dispose of documents properly or restore persistent storage equipment.
- Build document destruction capabilities into the office infrastructure.
- Implement and continuously update technical (**firewalls,** antivirus, antispyware, etc.) and nontechnical (security education, training, and

awareness) measures.
- When using social media, make sure that an employee does not post anything that will leak sensitive information about a company. Tools such as www.SecureMySocial.com provide measures that can prevent that.
- Conduct privacy "walk-throughs" and make spot checks on proper information handling.

Although there is no question that all organizations need to be aware of HRIS security issues and best practices, global organizations need to be particularly diligent. An organization may face specific laws regarding storage, transmission, and transfer of data based on the areas in which it operates. This may limit the flow of employee data across borders and may make the HRIS more complex or may require the organization to adopt different HRIS in different countries.

Contingency Planning

As highlighted already in this chapter, any company, regardless of size, is under threat from attackers. It is not a question of *if* but *when* a company may be breached. Therefore, it is imperative that organizations have comprehensive contingency planning (CP) set in place. The National Institute of Standards and Technology delves deeper into the area of contingency planning for systems in general (Swanson, Bowen, Phillips, Gallup, & Lynes, 2010). Contingency planning involves preparing for, detecting, reacting to, and recovering from an unexpected event that threatens various resources and assets in an organization. Contingency planning consists of three key areas: incident response, disaster recovery, and business continuity.

Incident Response (IR)

IR consists of a detailed set of processes and procedures that commence when an incident is detected. To be prepared for this stage, planners need to develop and document the procedures that must be performed during the incident and immediately after the incident has ended. Examples of procedures that may be performed before the incident include data backup

scheduling, training schedules, testing plans, and business continuity plans. Once an incident has been contained, then the recovery process can be initiated. This would include a damage assessment, addressing safeguards that may have failed, restoring data from backups, and even restoring confidence of stakeholders. Finally, it is important to note that if an incident violates civil or criminal law, it is the organization's responsibility to notify the proper law enforcement agencies.

Disaster Recovery (DR)

DR relates to the preparation for and recovery from a disaster, whether natural, or man-made. The key role of a DR plan is to reestablish operations at the location where the organization is usually located. It is imperative that organizations understand that they must not only plan for natural disasters, or for that matter mock tests are enough. At times even backed-up data may not be enough. For an effective DR plan, organizations need to ensure that the DR planning and preparation processes are treated as a continuous task. It is important to have a multitude of backups and contingencies, and that mock tests are carried out at scheduled and unscheduled intervals.

Business Continuity (BC)

BC planning ensures that critical business functions can continue in a disaster. This segment of CP is activated and executed concurrently with the DR planning phase. A key area of this phase is that it relies on identification of critical business functions and the resources needed to support them. Usually this phase involves use of at least one of three different types of backup sites: hot sites, warm sites, or cold sites. A hot site is an exact replica of the current HRIS data, with all systems configured and waiting only for the last backups. This site can often be brought online within a very short timeframe. Due to this reason it is also the most expensive approach in the DR process. A warm site has a reasonable set of equipment present to start the recovery process. Finally, cold sites are a little more than configured space. Everything required to restore service needs to be procured and delivered. Of the three options, this (cold site) is the least expensive.

As previously mentioned, it is important to test various plans. Contingency planning requires that as well. There are various techniques that can be used: desk check, structured walkthrough, simulation, parallel testing, and even full interruption testing. Each of these techniques, while important, is beyond the scope of our discussion. Interested readers should review the work of Gordon (2015) for more information on this topic. Results from these tests need to be carefully looked at, since they provide an avenue for iterative improvement. Constant evaluation and improvement will lead an organization toward an improved outcome.

Summary

Although it is clear that HRIS have numerous benefits in organizations, this chapter considers some recent issues associated with their use, including employee privacy and information security. In particular, the chapter considers (a) practices that may affect individuals' perceptions of invasion of privacy, (b) the components of information security, (c) the security threats faced by organizations, and (d) the implications for developing fair information management policies and security practices. Throughout the chapter, we argued that organizations should take proactive steps to develop fair information management policies that can be used to protect individual privacy, and implement information security practices and policies that safeguard employment data. This needs to be coupled with effective contingency planning strategies to provide a more holistic level of HRIS security.

Key Terms

Discussion Questions

1. Why are information security and privacy important considerations in the design, development, and maintenance of an HRIS?
2. List and discuss the major information security and privacy threats to organizations.
3. What are the important goals and considerations of information security?
4. Identify the important legal provisions governing information security and privacy in your country.
5. What is the role of HR professionals in information security and privacy management?
6. What are some of the best practices to manage information security and privacy in terms of procedural, technical, and physical controls?

Case Study: Practical Applications of an Information Privacy Plan

XYZ University is a medium-sized tertiary education provider in the state of Queensland, Australia. In undertaking its normal business of teaching,

learning, and research, the university collects, stores, and uses “personal information,” that is, anything that identifies a person’s identity.

With respect to students, this information may include, among other things, records relating to admission, enrollment, course attendance, assessment, and grades; medical records; details of student fees, fines, levies, and payments, including bank details; tax file numbers and declaration forms; student personal history files; qualifications information; completed questionnaire and survey forms; records relating to personal welfare, health, equity, counseling, student and graduate employment, or other support matters; records relating to academic references; and records relating to discipline matters.

The bulk of this information is retained in the student management information systems and in the file registry. Academic and administrative staff, at various levels, have access to these records only as required to carry out their duties. Portions of the information held in university student records are disclosed outside the university to various agencies, such as the Australian Taxation Office; the Department of Education, Employment and Workplace Relations; other universities; consultant student services providers; the Department of Immigration and Citizenship; and overseas sponsorship agencies.

The university has a well-documented information privacy policy in accordance with the community standard for the collection, storage, use, and disclosure of personal information by public agencies in Queensland. The policy relies on the 11 principles developed in the Commonwealth Privacy Act of 1988. These principles broadly state the following:

- Personal information is collected and used only for a lawful purpose that is directly related to the collector’s function.
- Before the information is collected, the individual concerned should be made aware of the purpose, whether it is required by law, and to whom the information will be passed on.
- Files containing personal information should be held securely and protected against loss; unauthorized access, use, modification, or disclosure; or any other misuse.
- Personal information can only be disclosed to another person or agency

if the person concerned is aware of it and has consented and the disclosure is authorized or required by law.
- Personal information should not be used without taking reasonable steps to ensure that it is accurate, up to date, and complete.

Presented below are three scenarios in which you need to decide how to apply the privacy policy and principles. The following scenarios were sourced from the Griffith University Privacy Plan (www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan/pdf/privacy-training-guide.pdf). The link to the privacy plan itself is www.griffith.edu.au/ua/aa/vc/pp. A complete statement of the relevant privacy principles can be found at www.dva.gov.au/health_and_wellbeing/research/ethics/Documents/ipps.pdf.

Scenario 1

Roger, a photocopier technician, has been asked to repair an office photocopier that just broke down while someone was copying a grievance matter against an employee of the agency. The officer who was copying the file takes the opportunity to grab a cup of coffee and leaves Roger in the photocopy room while the photocopier cools down. While waiting, Roger flips through the file and realizes that the person against whom the grievance was made lives on the same street as he does.

Scenario 2

Tom telephones a student at home about attending a misconduct hearing. The student is not at home; however, the student's partner, Christine, answers the phone. She states that she knows all about the misconduct hearing but asks for clarification of the allegations. When pressed, Tom provides further details. Tom feels comfortable about providing this information to Christine because she is the student's partner, and she has already told Tom that she knows all about her partner's misconduct hearing.

Scenario 3

Brad works in a student administration center, and Janet is a student. They know each other, as they used to attend the same high school. Occasionally, they get together at the university to have coffee and chat about mutual friends. Brad knows that Janet's birthday is coming up because Janet happened to mention that she'll be another year older in the near future. Brad decides to access the student information system to find out Janet's date of birth and home address. A few weeks later, Janet receives a birthday card from Brad sent to her home address.

Case Study Questions

With regard to the above scenarios, you need to decide

1. what information privacy principles have been breached,
2. how, and
3. what you would do to address the situation.

Student Study Site

Visit the Stuednt Study Site at **study.sagepub.com/kavanagh4e** for additional learning tools such as access to SAGE journal articles and related Web resources.

16 HRIS and Social Media

Stephanie Black

Editor’s Note

To remain competitive in today’s global environment, organizations are constantly looking for more efficient and effective means of acquiring and maintaining a highly qualified workforce. To do this, organizations are increasingly turning to Web 2.0 tools—such as wikis, social tagging, blogging, microblogging—and social networking sites—such as Facebook, LinkedIn, Instagram, and Twitter. These tools have become a valuable resource for organizations seeking to communicate organizational culture, to share information to attract top talent, and to provide potential job applicants with information about jobs, careers, and organizational culture. In addition, organizations are starting to use these tools to screen applicants. Therefore, it is crucial that those studying HRIS gain a good understanding of the usages of social media in the workforce and its ramifications for organizations, employers, and employees. In this chapter, the author outlines the major social networking tools globally, how they are being used by organizations in several different areas of the organization, as well as risks posed by the use of these tools, especially in the selection process.

Chapter Objectives

After completing this chapter, you should be able to

- Possess a general understanding of how the Internet and particularly social media are being used in human resources for recruitment, selection, and training
- Understand some of the current social media tools and how they are being used
- Discuss the value of using social media within organizations as well as some of the potential drawbacks
- Discuss the policies and training needed when using social media
- Explain some of the legal implications of using social media within organizations
- Implement social media policies within human resource departments and organizations that incorporate good business practices

Introduction

> *We don't have a choice on whether we do social media; the question is how well we do it.*
>
> —Erik Qualman

Social media are Internet-based platforms, based on Web 2.0 technologies, that allow users to generate and exchange content (Kaplan & Haenlein, 2010). Whereas Web 1.0 is a "readable" information portal that has allowed users to receive information without the opportunity to respond back via posts or comments, Web 2.0 is "writable" platform that and facilitates interaction between users and sites in a continuous and collaborative manner and promotes participation and information sharing (Laroche, Habibi, Richard, & Sankaranarayanan, 2012). Web 2.0 technology emphasizes tools and platforms that enable users to tag, comment, modify, augment, and rank; users can also create online communities such as websites and Internet blogs

to share information, ideas, personal messages, and other content such as videos. Some of the examples of Web 2.0 tools are Facebook, LinkedIn, Instagram, YouTube, and wikis. By using Web 2.0 tools, organizations can build and maintain social media public pages to promote their social network salience, increase interest in their organizations, and build relationships online (Parveen, Jaafar, & Ainin, 2015).

Although many organizations first started using social media for marketing and branding, with the adoption of more technology-driven human resource practices, organizations have rapidly integrated social media tools for attraction, selection, recruitment, and engagement purposes both within and outside the organization. Social media offers organizations many new possibilities for building their employment brand, expanding their network, targeting their audience, and attracting employees that fit with their company's culture and core values. Also, with the increased competition for human capital, many companies have been forced to expand their traditional local and regional searches for talent to a more national or global pool of applicants. As a result, they have begun using social media as a cost-effective means of targeting a wider audience in their recruiting and to gather more information than traditional resumes provide (Anderson, 2003; Brady, Thompson, Wuensch, & Gorssnickle, 2003; Brown & Vaughn, 2011; Hull, 2011).

Organizations are also using social media to more readily disseminate work-related content (Verhoeven, Tench, Zerfass, Moreno, & Verčič, 2012), connect employees, (Schultz, Utz, & Göritz, 2011), distribute information about the organization, and improve many organizational processes (Treem & Leonardi, 2012). For example, a survey by Careerbuilder (2014) showed a steady growth in the number of employers using social media for selection and recruiting purposes with corporations spending more than $4.6 billion annually on this technology (Young et al., 2008). A more recent survey by the Society for Human Resource Management (SHRM) showed that 84% of organizations use **social media websites** (SMWs) as a recruitment source, and an additional 9% are planning to adopt using them in the near future (SHRM, 2016). Research also shows that in the selection process, 73% of recruiters have made successful hires through social media; conversely, 30% of employers rejected candidates based on something they found in the

applicant's social media content (Bennet, 2014).

Social media has become influential in almost all areas of employment (Gregory, Meade, & Thompson, 2013) and is considered to be a valued tool for employee attraction, selection, and engagement. Therefore, with organizations' increased usage of social media as a recruitment and selection tool, and to improve employee engagement, this chapter seeks to provide a broad overview of how social media is being used as an HR tool and explain some of the positive and negative externalities with its usage.

Global Usage of Social Media

Globally, approximately 2.34 billion people access social media sites regularly (eMarker, 2016), a 9.2% increase since 2015. In addition, both companies and individuals are embracing SMWs at work. Although many companies are using SMWs to attract new employees, and to connect, inform, and retain their existing workforce, most companies are still not sure of how cost-effective these tools are. Despite this, nearly 70% of organizations expect to increase their use of SMWs in the future (Towers Waton, 2011). In addition, applicants are embracing SMW tools at work. A recent global study by Adecco (2014) showed that approximately 49% of job seekers are using social media to distribute their CV online, 29% are contacted by a recruiter through social media, and 9% receive a job offer. This same study showed that, geographically, Western Europe is currently the most effective in terms of the matching of job seekers with open positions through the use of social media.

Although Americans are familiar with popular SMWs such as LinkedIn, Instagram, Pinterest, and Facebook, other countries may have different patterns of SMW use and tools utilized. Presently, the fastest growth in social media usage can be found in the BRIC countries (Brazil, Russia, India, and China); by 2018, these countries are anticipated to be among the top users of social media (Statista, 2015). Countries like Brazil and India have shown to have social media preferences similar to the United States, such as Facebook, Twitter, and LinkedIn, but Russia and China exhibit a preference for using other popular sites. Examples of these preferences are discussed below.

Brazil represents the largest Internet market in Latin American and the fourth largest market in the world with over 140 million users (Statista, 2015). Most social media users in Brazil are younger, with an estimated 90% between the ages of 15 and 32. Facebook is the most popular SMW in Brazil, with 25% of the market; other popular sites are WhatsApp, LinkedIn, Tumblr, Twitter, and Skype (ComScore, 2014). The use of SMWs in India is also growing rapidly (90% annually) (Velayanikal, 2016). India currently has approximately 216.8 million SMW users and is expected to have 283 million users by 2018 (Statista, 2016). The majority of Indians access the Internet over a mobile device rather than a computer (Velayanikal, 2016). The most popular SMW platforms in India are Facebook (33% market penetration), WhatsApp (28%), Twitter (24%), and LinkedIn (21%) (Statista, 2016).

Russia has the largest Internet population in Europe with approximately 87.5 million users (Watson, 2016), over 82% of which are on social media (Statista, 2016). In addition, they tend to spend almost twice the amount of time on social media as Americans (Statista, 2016). Examples of popular Russian sites are Vk and OK. Vk is the most popular site in Russia with approximately 330 million users, of which the majority are younger (18–34 years old) and more than 75 million daily users (Smith, 2016; Watson, 2016). This site is similar to Facebook but also has a file-sharing platform where users can upload video and audio files. Another popular site is OK. Ok.ru has approximately 45.6 million daily viewers, of which 69%–70% are female, and nearly 40% are between the ages of 30 and 45 (Smith, 2016; Watson, 2016). This site tends to be used by individuals to connect with former classmates and friends (Smith, 2016). Both OK and VK are trying to take advantage of Russia's expanding "mobile-first" culture (Watson, 2016).

China is currently the world's largest social network market, but its market differs significantly from the rest of the world, primarily due to the Chinese government's censorship (informally called the "Great Firewall of China"). The Chinese government has blocked many of the popular social media sites such as Facebook, Twitter, and YouTube, which has led to SMWs such as Qzone, Renren, Tencent Weibo, Sina Weibo, and Youku becoming more popular in China compared to most other countries. Qzone works like a combination of Facebook and Tumbler in that it allows users to share photos, message, and blog (Statista, 2016). Renren is another popular social

networking site with a large target audience of college students, but many companies have also adopted it. Currently, approximately 85,000 companies in China are actively using Renren's confirmation system (Statista, 2016).

Tencent's Weibo and Sina Weibo are popular **microblogging** sites similar to Twitter. Each allow for 140 characters, but compared to English, each Chinese character is able to transfer more content. Sina Weibo has approximately 56% of China's microblogging market, and many of its users are relatively young and well educated (Satistia, 2016). In addition, over 5,000 organizations use Sina Weibo to share information and to participate in public online conversations (Satistia, 2016).

Youku is one of China's more popular video and streaming service platforms, with over 500 million active users (Statista, 2016). This platform is similar to YouTube, and it allows users to upload content online but allows users to share larger files (Statista, 2016). The company has also partnered with various license holders to distribute films and TV episodes on its site. Finally, innovative instant SMW messaging apps such as QQ and WeChat are growing in popularity in China and now have a 91% market penetration (Statista, 2016). WeChat is the most popular messaging app in China with over 840 million active users. This platform allows families, work colleagues, and others to communicate via their mobile devices. A unique aspect of WeChat is that it allows up to 500 participants in a single group chat. In fact, many individuals use WeChat rather than e-mail to conduct business. Business professionals can also use WeChat QR (quick response) to exchange business contact information rather than exchanging business cards. Finally, this same app is popular among Chinese for shopping online, paying bills, scheduling appointments, having food delivered, and booking taxis.

Social Media and HR Practices

Organizational Recruitment and Selection

The rapid diffusion of the Web and new technologies have significantly changed the landscape of how we communicate with each other and how organizations use technology to attract, acquire, and retain a new generation

of employees. Social media websites are now ubiquitous among organizations, as they allow recruiters to source, contact, and screen both active and passive job applicants. Through the use of SMWs such as Facebook, Twitter, and LinkedIn, organizations have been able to build their employment brand with prospective job applicants, expand their network of applicants, better target them, and better attract employees who fit with the company culture and core values. The amount of information that is readily available online and the ability to specifically target potential candidates for specific job skills from a global talent provides organizations with a potentially more effective tool for evaluating candidates than traditional HR selection means (Brown & Vaughn, 2011) and to significantly lower their recruitment costs (Anderson, 2003; Brady et al., 2003; Hull, 2011). As such, organizations are using social media platforms to collect the maximum amount of information possible on each applicant. This is done to maximize dependable role behavior, avoid negligent hiring lawsuits, and screen out applicants who might be untrustworthy or basically a poor hire for the company (Framington, 2008; Roth, Bobko, Van Inddekinge, & Thatcher, 2012; Shea & Wesley, 2006; Taylor, 2007). Industry research found that social media ranked fourth in terms of quality of applicants, behind referrals, internal transfers, and direct sourcing, but before a company's own career site (Jobvite, 2014). This approach to recruitment is "creating a new technical world order where job applicants are found and evaluated by their merits and contributions, rather than how well they sell themselves in an interview" (Meister, 2014, p.1).

Organizations are also using online software, social networks, and other platforms to conduct what is now called **social recruiting** (Wauters, 2011). The large global audience on social network sites such as Facebook provides many easily accessible opportunities for organizations to utilize for recruitment and selection purposes. For example, a recent study shows that up to 51% of employers are currently screening applicants' social network content, and high percentage of these firms have rejected applicants based on reviewing material they found online (Grasz, 2014). In addition, with 77% of employees connected to co-workers via social media (O'Connor, Schmidt, & Drouin, in press), organizations are using these networks to encourage employee referrals to find new qualified candidates.

As companies compete to attract and retain talented workers, and especially those with specialized skills, developing an effective recruiting strategy is a key concern for organizations. Thus, many of these companies are developing **social media playbooks,** as they strategically manage their social media plans to engage employees, get referrals from their employees on potential candidates, and recruit talented employees. For example, in the United States, UPS uses Facebook, Twitter, LinkedIn, and Google+ to post job openings and promote relevant information about the company and its culture (Zielinski, 2012). Internationally, the Hard Rock Café solely used Facebook as a recruiting source to hire 120 employees for a new restaurant in Florence, Italy (Colao, 2012).

The extensive amount of information available on social media sites has made SNWs a good venue for organizations to learn more about potential hires, and organizations are increasingly using the Internet as a resource to select new employees. In fact, many consider SNWs a better measure of a person's true job performance potential, because recruiters are able to evaluate the applicant under different criteria outside of the traditional interview setting or applicant-supplied information such as a résumé, application, skills assessment, interview, personality inventories, and drug tests (Black & Johnson, 2012).

According to Kluemper and Rosen (2009), the broad characteristics shown on SNWs may "be more practical than assessing more narrow aspects of **social networking profiles** that may be unavailable and/or inconsistent for a large segment of the profiles" (p. 571). In addition to listing profile information, the SNWs typically provides a list of the user's friends, interest groups, and special interests, which is a unique characteristic of SNWs. The information provided on social media sites also conveys the applicant's behavior and interactions in a unique light, in a context which is not necessarily focused on career advancement. Some research indicates that the individual's information on SNWs may actually be a more accurate reflection of the person's attributes than standard selection methods because they may reflect an individual's "maximal" work performance rather than the "typical" performance (Sackett, 2007).

Organizations are also more readily using SMWs to search for passive

applicants (SHRM, 2016), who might not otherwise apply to or be contacted by an organization. Similar to the benefits of Web recruiting, organizations can potentially increase the quantity and quality of their applicant pool by examining potential applicant profiles on Twitter, Facebook, and/or LinkedIn and then contacting those who are perceived as qualified for a position. Not surprisingly, approximately 66% of LinkedIn's revenue stems from its Talent Solutions division (Reuters, 2015), where recruiters purchase premium features to search for and access potential applicant profiles. SMWs may also be used to recruit active applicants, especially at the full-time, entry-level rank, and even hourly or part-time positions (Colao, 2012). For example, a variety of organizations—from the United States Army to Aon—use Facebook and LinkedIn to post job openings. Other organizations (e.g., Kroger) use Facebook and Twitter to promote job openings (Robb, 2014).

Popular Recruitment Sites

Many organizations are recruiting employees via social media by actively managing their social media presence and using recruitment tools to attract applicants. Candidates often view a company's website and then turn next to a company's social network sites such as Facebook, Twitter, and Google+ to learn more about the company. Thus, having a social media presence thru a mixed-media feed of frequently posted status updates can help promote an organization's online credibility.

Presently, LinkedIn is among the most popular professional social networking sites used by organizations. LinkedIn allows organizations access to over 467 million registered users and the world's largest professional network on the Internet (LinkedIn, 2016). Research from Herd Wisdom (Akiode, 2013) indicates that 89% of all recruiters reported having screened applicants on LinkedIn or chosen not to hire someone based on their online content. For organizations, LinkedIn provides an abundance of information about the qualifications of various jobseekers, and organizations can effectively use LinkedIn to leverage their own networks (and those of their employees) in order to find potential candidates. In addition, LinkedIn allows organizations to create company profiles as well as set up feeds of information for those who would like to follow them and be contacted about new job postings (Heathfield, 2015). LinkedIn also offers organizations a fee-

based solution, which enables human resource managers to more readily find potential job candidates that best fit the qualifications of the job they want to fill.

Facebook is another frequently used tool in recruitment. Overall, Facebook has the largest audience, with over 1.74 billion monthly active users (Facebook, 2016). It has recently become a popular platform for organizations in which to develop a brand presence, to target potential job applicants, to post jobs, to interact with job applicants, and to create an online community. Organizations have several options when using Facebook. They can target a general audience through a job free post in the Facebook Marketplace, or they can target a specific group of individuals by demographics with a Facebook Ad. With the paid ad, organizations may pay per click (how many people clicked on the job posting), pay per impression (how many people potentially viewed the ad), and determine how much they want to spend. Moreover, they have the option of advertising the job posting on a continuous basis or at a fixed time.

Twitter is also effective for increasing exposure and communicating with groups of individuals who want to follow organizations. As such, many organizations have created job channels on Twitter to communicate with and to attract new talent (Heathfield, 2015). According to its website, “Twitter is a simple tool that helps connect businesses more meaningfully with the right audience at the right time” (Twitter, 2016). With over 313 million monthly active users (Twitter, 2016), Twitter enables human resource managers to broadcast announcements more efficiently to large groups at the same time, which can reduce costs and increase exposure. Many companies use Twitter to engage with job seekers and post job listings and career events, but also market the company to individuals looking for a great place to work. According to Westfall (2016), 78% of *Fortune* 500 recruiting tweets contain hashtags—most commonly with branded terms related to job opportunities (46%). In addition, 35% of Fortune 500 companies have a recruiting-specific Twitter handle, which they use to tweet one to three times per day (64%) (Westfall, 2016). These companies are then using social media management platforms such as Hoostuite to filter responses, and reach out to the qualified applicants. Twitter is particularly useful when targeting applicants between 18 and 35 years of age (Westfall, 2016).

Human resource managers and job recruiters also utilize other social media platforms targeted at specific industries. Examples of some of these other communities include Dice.com, which specializes in tech careers, eFinancialCareers, a global career site for professionals in the banking and financial industries, and FinancialJobBank, which offers opportunities for job seekers and employers in the accounting and financial industries. CollegeRecruiter is also another popular venue that specializes in offering internships and entry-level positions for college students. These industry-specific sites offer organizations the ability to target specific job skills and to reach out to those seeking jobs by posting on these sites.

Training and Development

As organizations compete in a global market, businesses need to prepare their employees to be more effective. Social media tools can assist organizations in this process in multiple ways such as informing teams separated by geographic distance, time, culture, and organizational boundaries. Companies can use social media tools to communicate changes in company policies or organizational structures as well as to teach new job skills. Organizations can also utilize SMW tools to support e-learning, which offers delivery advantages and more flexibility to learners (Coppola & Myre, 2002; MacPherson, Elliot, Harris, & Homan, 2004). Social media offers organizations the ability to share practices, promote information and educational material, share opinions, views, and comments, embodying them in training programs and individual courses. For example, Facebook can be used to create an open or closed group to deliver content, and Twitter can be used in e-learning to connect learning communities or create smaller classrooms to inform employees on a specific topic or event, share highlights, make statements, or upload pictures.

Organizations can also use social media tools to assess meta knowledge about the type of employees it has, as well as their knowledge, skills, and abilities. For instance, Avaya used collaborative tags to identify organizational experts and integrated these data into a communication system (John & Sleligman, 2006). Organizations can also use SMWs to promote communication and enable their workers to expand their networks and social capital (Ferron, Frassoni, Massa, Napolitano, & Setti, 2010). They can also be used to share

information related to the status of ongoing organizational activities or to encourage interorganizational communication (Zhao & Rosson, 2009). The use of social media allows individuals to develop weak network ties and create a more robust organizational network (DiMicco et al., 2008). These associations can help workers gain access to others in the company, which reduces the role of gatekeepers who traditionally control access to these individuals (Ehrlich & Shami, 2010). Employees using social media, particularly those in less powerful organizational positions, may be able to use the ease of associations to garner social resources, which can be beneficial to the employee as well as the organization (Young et al., 2008).

Internal Communication and Engagement

According to a recent Gallup (2013) poll, 70% of the American workforce feels disconnected, or not engaged, at work. Lack of engagement at work can lead to higher absenteeism, higher turnover, and lower firm performance. With many employees feeling isolated by their business function or geographic location, organizations are increasingly considering how SMWs can be used to increase **employee engagement.** With approximately 60 million U.S. workers using social media to discuss employment-related issues (Hawley, 2014), if used appropriately, social media can be a productive platform to improve employee engagement.

SMWs can support employee engagement in a number of ways. First they can improve internal communications, can improve the sharing and exchanging of ideas, and can increase feelings of inclusion (Ruggs & Speights, 2013). In addition, SMWs have been shown to be effective in channeling employees' opinions (Miles & Mangold, 2014), gathering information (Fuller et al., 2006; Moqbel, Nevo, & Kock, 2013), and conveying competence (Ollier-Malaterre, Rothbard, & Berg, 2013; Yun, Takeuchi, & Liu, 2007). Social media tools can also be used to communicate with employees about the corporate culture, expected work behaviors, and other matters (Dreher, 2014; van Zoonen & van der Meer, 2015).

Many organizations are actively using social media to increase employee engagement. For example, L'Oreal, a cosmetic company, believes that people will have greater trust in information about what is like to work for a

company when it comes from their peers on social media rather than from the company (Simpson, 2015). Therefore, they use various social tools and tagging (e.g., hashtags) to get their employees to talk about their work lives on personal social media sites to show organizational transparency, promote corporate values, and build brand awareness. They also have one hashtag, #LorealCommunity, which employees use to convey corporate culture and talk about their co-workers.

Concerns Over Social Media

Some organizations have experienced problems with social media, such as the dissemination of inappropriate posts and decreased employee productivity (Landers & Callan, 2014). In some instances, organizations have been forced to take disciplinary action and have even terminated employees due to inappropriate social media usage. Examples of such dismissals can be seen in the case of Cheryl James, who was fired for posting something that the company considered a violation of HIPPA privacy laws (Katarsky, 2010). In another example, even though Ashley Heffran posted positive information about her organization, she was terminated for posting work-related information on social media (Galli, 2014).

Research indicates that up to 86% of employees are connected via social media to a work associate, and 77% indicated they used social media while at work. But 36% also indicated that they utilized social media while at work, against company policy (O'Conner et al., 2016). The unsanctioned and or inappropriate use of SMWs at work presents new problems for organizations who are concerned about the amount of time spent on social media, as well as negative postings that may impair brand management, hurt company morale, or cause other issues. In addition, there are a number of potential legal issues that may arise as a result of using SMWs. These are discussed in the following sections.

Corporate Social Media Policies

In an effort to address employee usage of social media, many companies have implemented social media policies to protect their professional reputations, as

well as proprietary information from exposure (O'Connor et al., 2016). In creating policies, organizations need to ensure they do not infringe upon the legally protected rights of their employees. According to Section 7 of the National Labor Relations Act (NLRA), organizations cannot restrict employees' right to communicate with co-workers about working terms and conditions. Depending on the type of work-related matter employees discuss via social media, their communications may be considered protected concerted activity and within the employees' right to debate (Schmidt & O'Connor, 2015). As such, many organizations have included nondisparagement clauses. These policies can range from requiring employees to not make disparaging remarks about the company, to not being allowed to identify that they are employed by the company, and in extreme cases, completely banning employees from posting anything organizationally related (Gordon & Argento, 2014). Nevertheless, it is important to understand that private sector companies that place heavy restrictions and all-out bans on their employees run the same risk of violating Section 7 of the NLRA (Schmidt & O'Connor, 2015). Therefore, it is recommended that organizations use legal counsel to assist them with determining their organizational polices and ensuring that they do violate federal laws. The National Labor Relations Board suggests that all employees be trained on social media usage and given social media policies with guidelines and clear examples of permitted and banned behaviors and how the organization's policy will be applied (Schmidt & O'Connor, 2015). Examples of many U.S. companies' social media policies can be seen at http://socialmediagovernance.com/policies/.

Organizations also need to ensure that they provide adequate training for their employees. Although the majority of organizations (80%) have a social media policy (Rubenstien, 2014), it is not clear that companies have provided their employees with training on the policy and if the employees are even aware of policy specifics (O'Connor et al., 2016). The limited research available suggests that many employees are not well informed on company policies regarding social media. For example, one study showed that only 31% of participants indicated their company had a social media policy, 34% indicated that their company did not have a social media policy, and 35% reported that they did not know if their company had a social media policy (O'Connor et al., 2016). Another global study by Adecco (2014) showed that

among HR professionals who use social media for recruitment purposes, only 30% had attended training courses organized by their company. This same study also showed that 61% of HR respondents either did not receive guidelines for the use of social media or were unaware that these guidelines existed. These results indicate that more training and better communication need to be implemented to inform employees and ensure that organizational policies are followed.

Recruitment and Selection

As noted above, a majority of organizations are utilizing SNWs as part of their recruitment and selection strategies. But organizations should also exercise caution when using them because of potential legal issues associated with using them in this way, and the inability to verify with confidence the profile information on these sites. In regard to the former issue, by viewing profiles on SMWs, recruiters may be discriminating—intentionally or unintentionally—against applicants belonging to a protected class. For example, a profile picture can reveal the applicant's gender, perceived age, ethnicity, and/or disability, all of which are not allowed to be used as part of a hiring decision. Organizations that view and judge applicant profiles on SMWs likely increase the probability of engaging in disparate treatment (i.e., intentional discrimination), and may even lead to disparate impact (i.e., unintentional discrimination; see Davison, Maraist, & Bing, 2011), leaving the organization susceptible to litigation. In fact, some organizations have faced legal issues when using social media for recruitment purposes. One study by William, Schaffer, and Ellis (2013) showed that the selection tools used by companies included material that had violations of the Fourth-Fifths Rules, administrative inconsistencies, personal bias problems, lack of documentation, unfair recruiting source issues, quota or unlawful affirmative action policies, failure to provide accommodations, and other legal complications.

Validity of SMWs in Selection

Another concern for human resource decision makers is the fact that organizations may be unable to infer—with relative validity—the

qualifications, personality, and/or integrity-related information on an applicant's profile when using SNWs. Presently, there is relatively little evidence that shows employers are making valid inferences about applicants' job performance based on their social networking data (Kluemper, Rosen, & Mossholder, 2012; Roth, Bobko, Van Iddekinge, & Thatcher, 2012), and research suggests that the spread of false information through social media can have negative ramifications for organizations and employees (Black, Stone, & Johnson, 2014).

One of the more difficult aspects when using social media is understanding the context in which the social media content was originally shared (SHRM, 2014) and determining if the source is credible. There is significant variability in terms of the content and information available across applicants, which creates issues for employers. For example, when employers view an individual's social media presence, they need to understand that they may not be looking at the entire conversation, history, or other factors. Where an individual places his or her professional content may also vary because the average Internet user utilizes five different social media platforms (Bennett, 2014). Some applicants may not use the particular SNW that the employer may use for screening purposes; others may limit access to their account. In addition, some job applicants may not have SNW accounts or may not be active online users, which can lead to incomplete and inconsistent information of the individual's knowledge, skills, and abilities (Johnson & Gueutal, 2014). Finally, an organization may be accessing an individual's personal site, such as Facebook, where the individual posts primarily to friends and family, while not accessing the candidate's professional site, such as LinkedIn, where he or she presents his or her professional attributes. Each of these can cause inconsistencies in the information collected, create undue bias, and lead to incorrect conclusions. In turn it can create errors in the selection process, increasing the probability of selecting the wrong applicant for the job (i.e., Type I error).

For this reason, it is important that organizations have a policy in place for notifying applicants of the use of these data as well as one that provides them with an opportunity to correct erroneous information. The lack of commonly accepted standards for SMW evaluations also increases the likelihood that different raters will apply different standards in evaluating various candidates

(Johnson & Gueutal, 2014). Organizations need to be cognizant of these issues and create a work flow process that ensures that the validity of social networking sites data is established before they are used in the selection process (Brown & Vaughn, 2011; Davison, Maraist, & Bing, 2011; Lucero, Allen, & Elzweig, 2013; Roth et al., 2012). At present, there is limited research about the best method to determine credible and professional social networking site content to use for recruiting and selection efforts, which presents complications for an organization. It is important that organizations develop consistent and accurate methods of utilizing social media and the information it provides to ensure that they are evaluating the correct applicant, appropriate content, and making better and more informed hiring decisions (Black et al., 2014). Without consistent and valid assessment measures in place, organizations may inadvertently expose themselves to litigation. For this reason, we agree with scholars who have argued against the use of SMWs in hiring decisions (Johnson & Gueutal, 2014) until its validity can be better understood.

Privacy Concerns

Of particular concern for employees and applicants is that fact that many human resource decision makers are using social networking sites to review and gather information about their off-duty behavior, lifestyle, friends, religion, and political affiliations (Gross & Acquisti, 2005). This also poses legal concerns for organizations, and can potentially lead to applicant perceptions that their privacy was invaded (Gross & Acquisti, 2005; Tabibi, 2012). One reason for this is that posts on social networking sites are intended by the user for family and friends rather than for the organization, and personal data that are often considered to be private are being viewed by potential employers (Tabibi, 2012). In addition, social networking data are primarily focused on off-duty behavior such as romantic relationships, and this type of information is not usually perceived as job relevant. A third reason is that some data found on social networking sites could reveal stigmatizing information (e.g., alcohol or drug use, disability, or sexual orientation), which could unduly stigmatize the applicant (Black et al., 2014).

From the perspective of the job applicant, many individuals have expressed concern about how organizations are reviewing their social networking data,

giving employers' access to data (e.g., photographs) that may reveal their protected class (e.g., race, disability status, age; Brown & Vaughn, 2011). According to one survey, 69% of American adults considered that employer access to social media was not acceptable and was an invasion of privacy (Rasmussen, 2012). Moreover, research showed that when applicants perceived that their privacy was invaded, they exhibited a negative attraction to the organization (Madigan & Macan, 2005), were less inclined to recommend the organization to others (Smither, Reilly, Millsap, Pearlman & Stoffey, 1993), were less likely to accept the job offer (Madera, 2012; Stone & Kotch, 1989), and were less likely to remain with the organization (Hausknecht, Day, & Thomas, 2004; Ryan & Ployhart, 2000). Also, when organizations invade an applicant or employee's privacy, they may gain the reputation of violating individuals' rights. This in turn may negatively affect their ability to hire the most talented employees. Although the labor market will ultimately affect applicants' job acceptance rates, those who believe that their rights have been violated may be less likely to be as committed to the organization (Black et al., 2014). Given the shortage of skilled labor, especially for particular jobs (e.g., software engineer, nurse, machinist; Stone, Lukaszewski, Stone-Romero, & Johnson, 2013), organizations need to be cognizant of an applicant's or employee's privacy perceptions of organizational access to his or her social network data.

Diversity Concerns

As more organizations use technology and implement SMW tools, they also must consider the risk of adverse impact. Some research has shown that individuals from lower socioeconomic backgrounds are less likely to have Internet access and use of computers, and that some socioeconomic and demographic differences exist with organizations use of e-selection (Kuhn & Skuterud, 2000; McManus & Ferguson, 2003). Although there are not significant differences by racial or ethnic groups or by gender among social media usage, there are socioeconomic differences (Pew Research Center, 2015); those with more education are consistently more likely to use social media. Presently, adoption rates for social media are at 76% among college graduates, 70% among those with some college education, and 54% for those with a high school diploma or less (Pew Research Center, 2015). Also, 78% of households with higher incomes use social media, while only 56% of those

in the lowest households use social media, a 22-point difference (Pew Research Center, 2015). There also are notable differences in usage by age; for example, ages 18–29 are most likely users of social media (90%) (Pew Research Center, 2015). In contrast, those over the age of 65 are the least likely to use social media (35%) (Pew Research Center, 2015).

Researchers contend that individuals belonging to traditionally marginalized groups may be at a disadvantage in the talent acquisition process when social media is used (Ruggs, Singletary, Blanchard, & Gur, 2016). Although many young applicants and minorities may use social media, they tend to have smaller network structures, and individuals with larger network structures tend to have access to more opportunities (McDonald, 2011). Thus, somewhat counterintuitively, older and educated males may actually have an advantage when SMWs are used for talent acquisition.

Thus, as social media tools become more commonplace, organizations need to be aware how of how these tools may have a differential impact (Johnson & Gueutal, 2014). Organizations may unduly bias minority job applicants who tend to have lower status networks than white males and less social capital (McDonald, 2011). Also, the use of SMWs in the attraction and selection process may lead to legal issues related to discrimination to the extent that demographic information that is currently protected might be used by the organization that influences the screening and selection of new employees (Davison, Maraist, & Bing, 2012). These practices may also lead to disparate impact as accessibility differences due to socioeconomic status may systematically disadvantage some groups to a greater extent than it does others (Davison et al., 2012).

To mitigate this risk, organizations can track who is engaging in their SMWs during the attraction and selection process, collect the demographic data, and use the data to examine the relation between the proportion of minorities who engage with their organization, those who apply for jobs, and examine the percentage of those hired to see if there are any discrepancies. Moreover, if SMW profiles are to be used in the screening process, training should be done within the organization to make human resource decision makers aware of implicit biases in an effort to reduce bias (Devine, Forscher, Austin, & Cox, 2012) and encourage a more diverse workforce.

Federal and State Guidelines

Ultimately, if applicants believe that their rights have been violated (e.g., Civil Rights Laws, 1964; 1991; Fair Credit Reporting Act [FCRA]), they may choose to seek legal redress. For example, the FCRA defines employee background checks as consumer reports. This Act contains specific rules about the use of consumer reports in the employment process. Specifically, the FCRA requires employers to give applicants advanced notice when a copy of the consumer report will be used to make hiring decisions; it further mandates that applicants must provide permission prior to organizations using these reports. Specifically, with respect to job applicants, the FCRA has two primary goals:

1. To ensure that job applicants are explicitly notified of and consent to any background checks that are done when credit, education, military service, and/or medical records are obtained
2. To ensure that job applicants are given the opportunity to correct any misinformation contained therein before any decisions are made by the employer

In the event that the job applicant is not hired by the organization, then this person must be given a copy of the report used to make the hiring decisions.[1] Therefore, under FCRA guidelines, applicants are likely to be notified when the organization has chosen to use social networking sites in the employment process. However, it is important to note that this federal law has two significant and often-used loopholes. The employer is not subject to the notice and consent provisions of the FCRA if it conducts the background check itself and chooses not to use a third-party screening company. Also, the employer may opt to tell the rejected job applicant that its adverse decision was *not* based on the results of the background investigation, but rather that the applicant pool was so large that its hiring decision was based on the fact that there were other individuals more qualified for the position. With these loopholes, the job applicant would not have the ability to obtain a copy of the prescreening report in order to view the negative information it contained (Curry, 2012).

[1] For more information on the reporting requirements of the FCRA, the

interested reader can refer to the FTC's guidelines at https://www.ftc.gov/tips-advice/business-center/guidance/using-consumer-reports-what-employers-need-know.

A second important law is the Privacy Act of 1974. This act governs the collection, storage, and use of employee data in federal agencies in the United States and prohibits the disclosure of personnel information to third parties without an individual's consent. Currently, however, there is no similar federal protection for private sector employees, and among the states, privacy laws differ. Over the last few years, some states have sought to protect applicants' rights to privacy, including restrictions on the use of off-duty behavior, and limitations on the collection of background, credit, or arrest records (Bennett-Alexander & Hartman, 2009). Several states have also passed laws that limit the degree to which organizations can request social network site passwords or ask applicants to log into their accounts (Tabibi, 2012). For example, Arkansas, California, Colorado, Illinois, Maryland, Michigan, New Jersey, New Mexico, Nevada, Oregon, Utah, and Washington have passed laws specifically restricting employers from demanding access to their employees' social media sites when those sites are not fully public (Claypoole, 2014). Other states either have legislation in the process of being passed or are considering legislating similar employer restrictions. For example, states such as New Jersey have passed laws prohibiting employers from seeking access to a person's account, such as a friends-only account at Facebook. They also have banned **shoulder surfing,** which refers to organizations making an employee access his or her personal account, while the management watches and reviews the material on the individual's social media page. The law also does not allow organizations to require an applicant or employee to change the privacy settings on a restricted account to a less-restrictive setting so that the employer can access it or by forcing the employee to accept an employer's "friend" request.

This law also prohibits an employer from retaliating or discriminating against a job applicant or employee for refusing to provide login information to the employer or discriminating if the employee reports violations of this law to the authorities (Claypoole, 2014). Similar privacy laws also have been enacted in Europe and other nations, with laws such as the European Data Act (Levinson, 2010). A complete review of the U.S. and international

privacy laws and legal cases can be seen in the work of Lucero et al. (2013), Levinson (2010), and Sprague (2009). Chapter 15 also covers important privacy considerations for human resources.

Despite these laws, organizations are still allowed to review social media pages, which typically are available to the general public. Also, employees or job applicants may voluntarily provide access to their social media accounts or may choose to "friend" work associates, including their supervisors. Taking advantage of these voluntary actions does not violate any of the new social media forced access laws (Claypoole, 2014). Nevertheless, because of the increased trend toward protecting personal online accounts and communications, organizations should develop fair information policies to protect job applicants' privacy. For example, organizations should consider documenting how they obtain any social media information regarding employees or job applicants. These policies are discussed in the following section.

Research-Based Tips for the Use of Social Media in HR

To successfully utilize social media, organizations need to be proactive in the development of their social media processes and strive to stay current on the legal environment, the validity of the content used, and best practices. By proactively managing their use of social media platforms and implementing proper protocols, HR managers can stay connected with their target audience and be more successful in attracting and selecting a talented workforce (Black, Washington, & Schmidt, 2016). Based upon the research conducted to date, it is recommended that organizations take the following steps to improve their social media policies:

1. *Be proactive in establishing social media policies and stay current on fair information policies regarding the use of SMW data.*
2. For example, organizations may want to appoint a qualified individual or individuals to monitor social media and technology applications, assist the organization in setting new social media goals, and provide feedback regarding the most appropriate social media platforms (Black

et al., 2014). In addition, it is critical that human resource managers keep well informed of changes at the state, federal, and international levels. Therefore, it is recommended that organizations retain legal counsel to keep abreast of new rulings as they arise and to stay current on legislation regarding social media use to ensure compliance.

3. *Implement measures to keep current on SMW technology adoption to ensure they are using SMW technologies that are most popular in the locations in which you operate.*
4. Organizations may want to appoint qualified individual(s) to monitor social media and technology applications to assist the organization in setting new goals, providing feedback on current usage, implementing new technology, and utilizing the most appropriate social media platforms (Black et al., 2014). In addition, because organizations tend to adopt technology more slowly than society does (Jobvite, 2014), it is important that organizations become more agile and adaptable in their use of SMWs and incorporate those that best fit their needs. One way to do this is by contracting with an outside entity and have them provide analytics on current trends and overall social media effectiveness.
5. *If a decision is made to use SMWs in recruitment and selection, determine what type of information is relevant and valid, and ensure that collection methods do not collect data about characteristics protected by law.*
6. *Be active in establishing privacy policies for the HR decision makers, employees, and job applicants.*
7. It is important to note that this author, and others (Johnson & Gueutal, 2014) are currently not in favor of the use of SMWs in as part of the selection process (due to concerns about the validity of SMW information, applicant privacy, and the potential for adverse impact), if an organization decides to use social media for these purposes certain steps should be taken. First, use SNWs that are professionally rather than socially oriented (e.g., LinkedIn). These types of sites are more likely to contain job-relevant information than social-oriented websites. Second, verify that decision makers are using proper screening methods to ensure that they are not screening the wrong applicant and making recommendations based on false information. Third, consider having individuals not involved in the selection decision-making process screen the SMWs for relevant data to ensure that data about protected classes

are not shared with decision makers. Fourth, be active in establishing privacy policies for the HR decision makers, employees, and job applicants. Organizations need to implement fair information policies to increase individuals' perceived control over information and decrease their negative reactions to these practices. For instance, organizational policies might provide advanced notice to applicants that SMW data will be collected during the selection process. In practice, employers could provide a disclosure form to applicants who are requesting a release of information and specifically refer to a company's policy regarding access to SMWs (Black et al., 2016).

8. *Determine the level of employee involvement in developing and promoting social media policies, what the organization will state on social media sites, and how the information will be disseminated.*
9. Different levels of management should participate in the development of an organization-wide social media policy. In addition, they should help determine when new polices and initiatives will be implemented, how the content will be made readily available to share, and how it will be monitored. The organization needs to provide proper training to employees to help reinforce these corporate goals and initiatives.

Summary

Social media has become an integral part of society. It also has created new challenges for organizations, as they are now faced with integrating this technology within their organizational structure, particularly human resources. In order to be competitive in the pursuit of talent and skilled labor, organizations must be agile in adapting to these new technologies and readily incorporate them into their social media practices. In addition, organizations must proactively establish fair information policies that address the use of SMW information as part of their overall Internet usage policy. Moreover, they must work to implement new tools that will enable them to better communicate and train their employees, collect data to better inform hiring decisions, attract a new and more diverse workforce, and create a more engaged and connected workforce.

Key Terms

Discussion Questions

1. What are some of the advantages to using social media tools in the recruitment process?
2. What are some of the disadvantages of using social media?
3. What are some of the legal ramifications?
4. What types of policies should organizations implement when using social media tools for recruitment?

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17 The Future of HRIS Emerging Trends in HRM and IT

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Editors' Note

In Chapter 1, the history of HRM was discussed along with its eventual merging with the field of information technology (IT), thus creating a new field of study and managerial practice—human resource information systems (HRIS). Throughout this book, the authors have provided information how HRIS are developed and implemented, how they can affect the delivery of HR functionality and services, and the key considerations as an organization utilizes these systems (e.g., security, analytics, administration). Much of this work focuses on how these systems have evolved and how they are being used today. In this chapter, the authors take a different approach. Here the authors look ahead to where the field of HRIS is moving in the future. Specifically, the chapter discusses important trends in the practice of HR and the technologies that may drive change in HRIS in the coming years.

Chapter Objectives

After completing this chapter, you should be able to

- Discuss the short-term future trends in HRM
- Discuss the long-term future challenges for HRM and tactics to handle them
- Explain the impact of future trends in IT and information systems (IS) and workforce technologies on the improved operation of an HRIS and HRM programs
- Understand how HR and IT/IS are combining for future HRIS business applications

Introduction

> *The best way to predict the future is to invent it.*
>
> — Alan Kay

There is no doubt that technology has radically altered the world of work. Today, one can work anytime and anywhere, using any device—possibilities that have globalized the workplace and given it a 24/7 work cycle. Beyond the early advantages through automating HR processes, technology enables HR processes to be more integrated than ever with other corporate functions (e.g., payroll, finance, supply chain, marketing) in the pursuit of organizational success. Although HR has evolved from an administrative to a strategic focus, transactional activities, such as HR administration, legal compliance, and benefits management, still consume a major portion of HR resources. With the increasing focus on strategic HRM and developments in technology, HR professionals are deploying innovative technology solutions to address their core challenges, such as talent management and workforce metrics and analytics (Haines & Lafleur, 2008). Multinational enterprises are leveraging HRIS to align their information technology, processes, and people to replicate their HR policies and practices across global operations (Morris

et al., 2009). Some enterprises also use HRIS for effective disaster planning and recovery during various crises, such as terrorist attacks and natural disasters (Hurley-Hanson & Giannantonio, 2008).

Although organizations have done an excellent job automating basic HR functions and reducing staff, they continue to question the strategic value of these changes. This does not mean that HRIS lack organizational value, but instead that the value gained to date, as noted in many of the chapters in this book, has come through the automation and evolution of HR processes. In addition, it is important to remember that technology is only an enabling tool and not a solution or panacea for HR-related problems. It is now largely up to HR professionals to exploit technology's potential fully by taking it to the next level of transformational impact. And we're just getting started! The future of e-HR will be driven by changes in both HRM and HRIS. In this chapter, we briefly touch on the trends affecting each.

Future Trends in HRM

Forecasting the future is, in general, quite difficult and even more so in HRM. Although one can examine past trends and extrapolate to the future, there can be unexpected contingencies, such as the financial crisis of 2008–2009 that impact HR processes. Also, changes in laws, directives, and guidelines from governmental agencies can strongly affect the future of HRM and HRIS. To examine any future trends in the HR field, one must look within and between countries, since labor laws differ from country to country and, thus, could have a significant impact on any new developments in HRM for that country (see Chapter 13). Although this chapter focuses on trends that are affecting HRM in the United States, it is important to remember that some of these trends will also be true for other countries, while others may differ somewhat in terms of specific future trends within another country or culture. We briefly discuss six trends that will impact HR in the coming years.

Health and Wellness

The cost of health care is a growing concern for organizations, with recent estimates suggesting that health care accounts for nearly 8% of an

organization's operating costs (Society for Human Resource Management [SHRM], 2016). Not surprisingly, chief financial officers have identified health care costs as the number one issue facing their organizations (Robert Half, 2012). To address these concerns, organizations are turning to wellness initiatives, others are reconsidering what health plans to offer, and most are passing increased costs on to their employees. For example, companies are providing gym memberships, personal trainers, nutrition programs, smoking cessation programs, and stress-reduction programs. Other organizations are turning to technology to help them manage health care costs. Indiana University Health used a fitness tracker to encourage a healthier lifestyle. They found that over 35% of their workforce used the fitness tracker, and over 90% of these employees were motivated to continue the healthy changes going forward (Wright, 2015).

Not only are health care costs increasing in the United States, but with the passage of the Patient Protection and Affordable Care Act (i.e., "Obamacare"), HR departments are facing a number of issues associated with its implementation. For example, some organizations offer multiple health plans, some of which are available only to highly compensated employees. The new law makes some provisions of these plans illegal if they are not available to lower compensated employees as well. In addition, organizations will have to consider the penalty costs of not offering health care to employees and the makeup of their workforce (e.g., full time, part time, contingent) as they determine how to best comply with the new law and to best provide plans that serve their employees. For example, firms are cutting employees' hours, downsizing, encouraging low-income employees to sign up for Medicaid, and offering higher deductible plans (Shane, 2014). Some companies are even moving to a defined contribution health care plan (Sammer & Miller, 2013). Finally, because of the increased regulatory and compliance requirements of Obamacare, companies are having to adopt new and upgraded software to support their reporting and compliance requirements. Whatever your opinions on Obamacare or the state of health care in the United States, it is safe to say that health care issues will be taking up a lot of time in human resources during the next five years.

Business Intelligence and People Analytics

HR is under increasing pressure to show that its policies and practices add value to the firm. To address these pressures, HR is increasingly turning to the use of business intelligence to support complex metrics. Although covered in greater detail in Chapter 14, we also briefly discuss analytics here because their use will only continue to grow. Many organizations already have basic reporting capabilities, but they are increasingly looking to incorporate more sophisticated metrics to better support HR programs. For example, organizations are using analytics in recruitment, with the goal of increasing consistency and eliminating human biases in the hiring process. Deloitte reports that approximately 30% of firms it surveyed are beginning to feel comfortable moving into analytics (Fleck, 2016).

How important are metrics becoming to HR? Consider that each year SHRM brings together a panel of experts to address the most important upcoming concerns facing HR, and one of the panels is specifically focused on metrics. Here are three key predictions from these panels about metrics (Clark & Schramm, 2012):

1. Organizations will increasingly demand that HR better measure and assess the value of its human capital initiatives.
2. The increasing use of metrics may lead to a standard, and widely accepted set of metrics to "describe, predict and evaluate the quality and impact of HR practices and the productivity of the workforce" (p. 6).
3. Organizations begin to transform their view of HR, from that of a people function to more of one focused on decision science.

Essentially, with the increasing use of metrics and data analytics, organizations are bringing "decision-making tools such as environmental scanning, scenario-based planning, hypothesis formulation, and testing and organizational development tools . . . to improve workforce management decisions" (Clark & Schramm, 2012, p. 7). HR will need to develop metrics for both static statistics to "benchmark" HR progress, and programs as well as dynamic measures that assess the effectiveness of HR progress and programs over time.

But most importantly, as more and more organizations embrace analytics, managers cannot lose track of the fact that "machine learning produces facts, rather than conclusions" (Cappelli, 2015, p. 5). Managers and employees

make decisions and come to conclusions based upon the data. The risk for organizations that as we continue to embrace more sophisticated analytics, managers and employees will understand less and less about how the data are analyzed and recommendations are presented. Ultimately, managers may assume that the system output represents a conclusion, rather than facts for supporting a decision, and place decision-making authority on the system rather than their own judgment. During the next several years, this trend to the use of data analytics will only grow as HR seeks to use both its static and dynamic metrics to drive more effective decision making. And HR professionals will need to better understand their capabilities and limitations to truly leverage them most effectively.

Demographic Workforce Changes

The workforce in the United States is undergoing a dramatic transformation on multiple fronts. First, it is becoming more diverse. More women and minorities are entering the workforce than ever before. For example, nearly 60% of working-age women are now in the workforce compared to only 40% in 1970 (Bureau of Labor Statistics, 2011). Also contributing to the diversity of the workforce is the growth in the Hispanic American population in the United States. Currently, Hispanic Americans make up 15% of the U.S. population and account for more than half (50.5%) of its population growth (Pew Hispanic Center, 2010). They are also expected to comprise at least 25% of the population by 2030 (U.S. Census Bureau, 2010).

Second, there is a major demographic shift occurring in the workforce. Although as recent as a few years ago, there would be upcoming large retirements of baby boomers from the workforce, more recent data suggest that baby boomers are postponing retirement. Data from the Bureau of Labor Statistics (2008) suggest that the fastest-growing age groups in the workforce will be those over 65 years old, with projections suggesting that participation of those over 65 will have grown by over 80% between 2006 and 2016. At the same time, this same study identified a coming problem. The participation rates of those younger than 25 are projected to decrease by 7% over the same time frame. This means that organizations will have a workforce that has much greater age diversity than they are typically used to managing.

What does this mean for human resources in the coming years? Although there are positive aspects to this changing age demographic, there will also be challenges for organizations. Having a workforce that has large ethnic, cultural, and age diversity brings tremendous opportunities for creativity, innovation, and market growth for organizations. But it can also bring challenges for human resources. HR will need to rethink recruiting and retention strategies in light of these changes. Employment factors that are attractive to a married 60-year-old male may be very different than what is attractive for a 24-year-old Hispanic female. In addition, there are a number of critical technological factors that may come into play with a diverse workforce. For example, as briefly discussed in Chapter 10, there are a number of issues with respect to minorities, computer use, and adverse impact.

Second, with multiple generations working together, there will be varied experiences, comfort, and use of technology. As we will discuss later in the chapter, younger workers have different expectations on the use of technology at work and how they balance their work data and personal data. As one specific example, over 81% of college students get their news from an electronic device (Cisco, 2011), whereas nearly 60% of those over 65 read a physical newspaper (Pew Research Center, 2012).

Ultimately, organizations that are able to most effectively leverage the potential of their workforce diversity will be most successful. “Workforce diversity is not just a competitive advantage. Today it’s a competitive necessity” (Cascio, 2013, p. 14).

Employee Engagement

A major challenge facing organizations is employee engagement and retention. Engagement reflects the extent to which employees are emotionally connected and committed to the organization. Research has found that most employees are *not* engaged at work. Some estimates suggest that as few as 13% of employees are engaged at work (Crabtree, 2013). Lack of engagement is estimated to cost organizations over half a billion dollars in lost productivity annually (Sorenson & Garman, 2013). Not surprisingly, organizations are very concerned about how to connect employees and

increase their engagement at work. Organizations are increasingly turning to technology to improve engagement. Tools such as social media, groupware, gamified mobile apps, and recognition software are all being utilized to improve employee connections and engagement. Organizations are also using technology to push short surveys to regularly assess the pulse of employee's engagement (Boese, 2015). These surveys are helping organizations better understand the *why* behind engagement instead of simply the level of engagement. Thus, rather than waiting for employees to complete an annual engagement and satisfaction survey, organizations are better able to respond to engagement issues in a more timely manner. Whatever approach an organization chooses to utilize in support of engagement, those studying HRIS cannot underestimate the importance of employee engagement and the extent to which HR will be involved in improving it.

Growing Complexity of Legal Compliance

One of the most important themes moving forward for HR will be the growing governmental and agency compliance requirements. Human resources has always been affected by legal compliance, but many would say that the pace of regulations continues to grow. For example, the Equal Employment Opportunity Commission (EEOC) continues to develop additional guidelines and states continue to pass additional regulations on issues as varied as hiring practices to workplace safety. In addition, the recent negotiations due to the "fiscal cliff" have resulted in a change in the Social Security tax rates for all employees, and the raising of taxes for high-earning employees. Human resources will need to be prepared to implement these changes, and additional changes are likely to occur in the coming years. In addition, changes due to the Patient Protection and Affordable Care Act will require human resources departments in organizations from the very small to the Fortune 100 to comply with a myriad of new requirements. For example, new federal and state guidelines such as the Lilly Ledbetter Fair Pay Act, new overtime regulations for salaried employees, new guidelines regarding this use of criminal records in hiring decisions, and broader interpretations of marriage are all having significant impacts on how organizations are making HR decisions. In addition, consider the comments from SHRM's expert panel (Clark & Schramm, 2012):

1. Firms will increasingly focus on evidence-based hiring to ensure that they remain compliant with federal and state laws as well as EEOC guidelines.
2. Globalization means that labor law will be increasingly affected by trade agreements and global labor standards.
3. Organizations will need to be more actively aware of their compliance environment as the National Labor Relations Board and the Department of Labor are becoming more active in making new rules and attempting to reverse prior decisions.

What will HR departments need to do in response to these changing laws and compliance guidelines? Essentially, they will need to have the information to support adjustments to the way that HR operates. But they will also have to ensure that the HRIS applications they are using have the ability to handle these changes. Fortunately, there are HRIS applications that assess the legal risk level in terms of unfair discrimination on the basis of race, age, and gender. Results from these analyses can identify the departments where there could be legal problems in complying with laws and legal guidelines. This would enable the company to be proactive in resolving these problems before litigation. Consider the following:

> Firms increasingly will need to adapt their HRIS in order to remain compliant. Pending changes in tax codes, financial reports, equal employment opportunity compliance and health care all suggest that compliance and reporting demands will increase. For example, the new Patient Protection and Affordable Care Act will significantly increase the amount of corporate reporting required by the federal government. It is hard to imagine organizations without a strong HRIS effectively navigating this new environment. (Johnson & Gueutal, 2011, p. 25)

Virtualization of Work

A final trend in HRM on which we briefly touch is the virtualization of work. No longer are employees confined by physical or temporal space. Employees can conduct work anywhere and at any time. “The **virtual workspace** can be

defined as an environment where employees work away from company premises and communicate with their respective workplaces via telephone or computer devices" (Lockwood, 2010, p. 1). For example, one of the authors recently taught a class in which a student was part of a virtual team. His team consisted of six members on four continents, none of whom had physically met. Together, they were responsible for ensuring that a global corporation's database systems were "constantly up" and free of errors. They had to coordinate global schedules to hold monthly meetings to ensure that the team was meeting targets and schedules. Yet they had to do this, while never working in the same physical space. In addition, companies are allowing employees to develop more flexible arrangements for working in the office or at home (e.g., telecommuting). Approximately 25% of employees currently telecommute in one form or another, and nearly all employees desire to telecommute at some point (Global Workplace Analytics, 2016). Managing in this geographically dispersed environment creates challenges in leadership, in the effectiveness of communication, in technology, and in procedures for conducting virtual meetings and ensuring appropriate HR management. Given the growing use of telecommuting and virtual teams, organizations will increasingly need to be aware of the benefits and pitfalls of managing employees in the virtual workplace.

Future Trends in HRIS

As noted earlier in the book, technology has long had an impact on organizational and HR functioning. As such, it is really impossible to talk about the future of HR without talking about the future of technology. The implementation of technology can influence HR practices, which in turn can drive the use of new technology within HR, which will then drive the creation of new HR practices. This ongoing relationship means that over time HR and HRIS mutually influence the development of each other. Although early technology focused on the automation of HR processes, reduced expenses, and better service, the future of HRIS will be focused on social and mobile technologies that empower both employers and employees to deploy, share, and use their knowledge for the common benefit of their company. In this section, we briefly discuss the changes in technology that will have a large impact on the HRIS and the delivery of HR functionality.

Bring Your Own Device

The first trend in technology that will affect HR and HRIS is mobile computing and "**bring your own device**" **(BYOD)**. The change is a dramatic departure from how organizations have previously managed their technological infrastructure, and presents a challenge for organizational IT support. Previously, the most common arrangement by organizations was to manage a centralized and tightly controlled technological platform (e.g., IBM, HP, Dell, Windows), and anyone who wanted to use another platform (e.g., Mac, Linux) would potentially have problems receiving adequate support. But, today, employees are more likely to want to use their own personal devices (e.g., smartphones, tablets, and laptops) to work. For example, recent estimates suggest that there are over 7 billion mobile devices in use today—more than the number of people in the world (Boren, 2014)—and over 40% of the Internet traffic today is driven by mobile devices (Dorrier, 2014)! Over 70% of employees have said that they want to use their own personal devices at work (Forrester, 2012). As a result, nearly 50% of firms are expanding the breath or depth of support for these devices (Forrester, 2012). Beyond these important numbers, the move to BYOD has several implications for HR and organizational functioning.

The move to mobile does create some interesting issues for employees and the organization. For example, how do you deal with the privacy issues associated with the storage and use of personal and work data on the same device? In addition, the complexity of managing network and data security dramatically increases when employees bring their personal devices into work, which means that organizations will need to rethink data and network security practices to support these devices. Finally, companies will need to develop policies in regard to the use of these devices and who will pay for these devices. Cisco found that over 70% of younger employees expected companies to pay for their mobile data plans if they used their personal device for work, but less than one-third of firms are doing this. Interestingly, though, the extent to which organizations will pay for subscriptions showed great variance by country, with companies in Mexico (72%), Brazil (61%), and China (58%) showing the greatest support (Cisco, 2011).

Along with the growth in the use of mobile devices will be the growth in

smartphone apps (e.g., for the iPhone, Blackberry, Android, or Windows). For example, vendors such as Workday and SuccessFactors have built apps where employees can use their mobile devices to access and connect to the corporate HRIS. Because of the rapid growth in the use of apps, Workday has promoted a “mobile first” development model where tablet and smartphone devices are targeted as the primary user interface (Wilson, 2013). An example of a mobile app on the iPhone can be seen in Figure 17.1.

Mobile computing increases access to HR data. No longer are employees “chained” to their desks when working with HRIS data. For example, tablets can be used during the interview process to evaluate applicants in a real-time manner. Employees can fill out expense reports wherever they are located and can capture electronic images of receipts as they incur expenses. If a workers’ compensation incident occurs, HR case managers can document issues at the scene of the event—taking photos of the situation for immediate storage in the database. In a BYOD world, as employees become more comfortable with using their personal devices at work, and as younger employees continue to lead, we expect there to be an expansion of organizational support for these devices.

Gamification

A second trend in HRIS is the gamification of business activities, especially those enabled by technology. It has been suggested that over 70% of global companies will have gamified at least one business activity (Gartner, 2011), and that gamification will be an $11 billion market (Markets & Markets, 2016) in the next few years. **Gamification** is the use of game design elements in nongame contexts (Robson, Plangger, Kietzmann, McCarthy, & Pitt, 2015). For example, gaming elements can be designed into a myriad of business tasks such as onboarding, employee communication, knowledge sharing, and training. Gamification uses achievement levels and badges, rewards, and leaderboards to encourage friendly competition, and is seen as a key way to drive employee engagement, productivity, compliance, learning, and health.

Figure 17.1 SuccessFactors Mobile HRIS App


Carrier
5:34 AM
To-Dos
Details
Job Offer Approval
Hannah Summers for Director of Product Management, India Market
Version 1
Submitted by: Carla Grant, General Manager, Industries
View Resume
First Name: Hannah
Last Name: Summers
Salary Base: 120000.0
Target Bonus Amount: 15000.0
Approve
Decline
successfactors
An SAP Company

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For example, companies are turning health activities into games, rewarding employees for engaging in activities such as exercising or eating healthy. In addition, firms are using gamification to help managers and employees gain insight about their performance. Cigna uses data from games to assess employee problem solving, quick thinking, and logic (Fleck, 2016). Finally, Novartis uses simulation games to train teams overseeing clinical trials (Robb, 2012).

At the same time though, organizations should carefully assess the risks of gamification, as nearly 80% of gamified applications will not meet their stated goals (Gartner, 2012). Some employees may not like the competitive nature of games and the competition inherent in leaderboards. In addition, gamified activities run the risk having the employees focus on the game activities and task, rather than the business task at hand. Finally, poorly designed gamified activities can actually distract from the task and reduce engagement. To maximize the potential of gamified activities, here are some recommendations from Abshire (2013):

- Make games clear and simple.
- Break long tasks into small, achievable short-term goals.
- Provide triggers to reinforce behaviors.
- Address needs and desires of the employees.
- Convert user into players.
- Provide for social connections.
- Create an overall unifying theme.

There is no doubt that gamified applications in HR will continue to grow, and organizations will need to determine how to best integrate them into HR and organizational processes.

Web 2.0 and Social Networking

Web 2.0 refers to a second generation of Web-related services focusing on creativity, collaboration, and sharing. With Web 2.0, users not only access information but also generate, share, and distribute new content. Examples of Web 2.0 tools include the following:

- Social networking sites (e.g., Facebook, LinkedIn, Twitter)
- Wikis (collaborative, shared, Web dictionaries that enable users to contribute to online knowledge repositories, documents, or discussions)
- Blogs (short for weblogs, i.e., personal or corporate online journals or diaries hosted on a website)
- Mash-ups (Web applications that combine data from multiple sources into a single location, or application—e.g., pulling up a rental car booking site within an airline booking site)
- Podcasts (audio or video recordings)
- RSS (rich site summary/really simple syndication)—feeds which publish frequently updated sites such as blogs or news
- Personal websites
- Peer-to-peer networking (P2P)—file sharing (e.g., text, music, and videos)
- Collective intelligence (sharing knowledge to tap the expertise of a group)
- Web services (Web-enabled instant communication between users to update information or conduct transactions—e.g., a supplier and a retailer updating each other's inventory systems)

Web 2.0 has also encouraged businesses to promote user collaboration to share knowledge and to communicate with business partners, such as suppliers and outsourcing providers. With an emphasis on sharing, Web 2.0 can dramatically change the way in which employees communicate with each other and with customers. Using Web 2.0 will require the HR department to pay greater attention to the legal, ethical, and security implications of information exchange. Blogs are used not only to share information within the company and with external stakeholders, but also to communicate organization culture and personality. Because organizational culture is based on the shared values of employees, informal communication such as this can help modify the company's culture, particularly during the development and implementation of a new HRIS.

But the most visible way that Web 2.0 is affecting HR is through its support of social networking sites (SNWs). Although we devote a full chapter to SNWs in this book (Chapter 16), it is important for us to also note it as a trend in HRIS, because organizations are increasingly integrating these tools into their overall portfolio. In addition to tools such as Skype, LinkedIn, Twitter, and Facebook, organizations are increasingly embracing other social tools such as Pinterest, Instagram, YouTube, Periscope, and Shapchat in their SNW portfolios. In addition, they are developing their own tools to support internal networks based on the capabilities of the broader SNW tools. For example, Facebook at Work allows a company to leverage the capabilities of Facebook, but to do so from within the corporate firewall. Skype for Business is a messaging, conferencing, and collaboration tool that connects organizational employees together. Due to the growing use of social networking, HRIS vendors are developing applications within their product offerings to help support employee collaboration, onboarding, and learning. Figure 17.2 provides an illustration of how SAP Jam is designed to mimic such popular social tools as LinkedIn and Facebook to increase employee acceptance and reduce the employee learning curve.

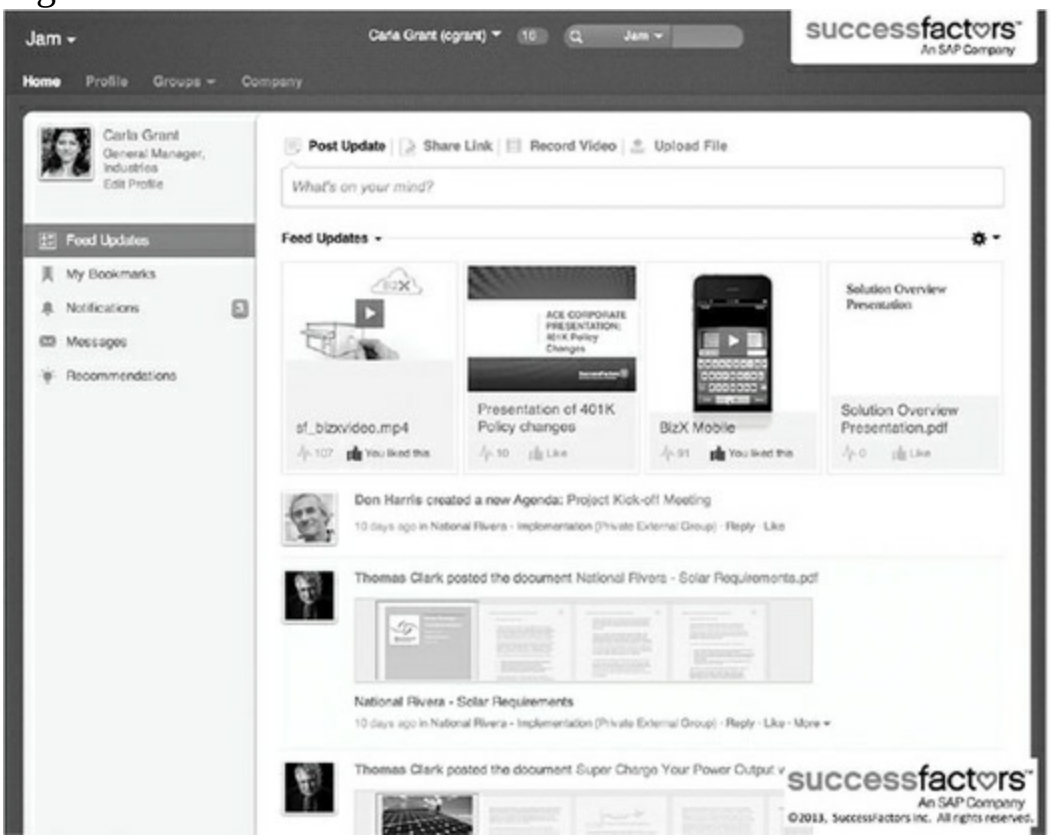
But as briefly noted in Chapter 16, SNWs are not static, and tools are always evolving. In fact, they evolve so quickly that organizations and society are not able to develop mechanisms to support and regulate these tools. For example, 25 states have recently passed legislation that limits an employer's ability to use and access applicant and employee accounts on tools such as Facebook. Due to the fluid legal state of the use of SNWs and because of the relative novelty and complexity of using social networking tools, it is important that your organization has a specific organizational use policy. Although many firms have a dedicated person who manages the company's SNW strategy, more organizations typically rely on HR to develop and enforce the corporate SNW strategy. As such, HR leaders should stay abreast of the latest SNW tools and legislation.

Internet of Things

The **Internet of Things (IoT)** should also have a dramatic impact on the practice of human resources in the coming years. The IoT is a "worldwide network of interconnected objects uniquely addressable based on standard

communication protocols” (Gubbi, Buyya, Marusic, & Palaniswami, 2013). Estimates suggest that by 2020, there will be 50 billion of these devices communicating over the Internet in businesses (Brin, 2016).

Figure 17.2 SAP Jam



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With the IoT, technology is embedded into static objects such as roads and bridges, manufacturing equipment, medical devices, traffic controls, thermostats, clothing, watches, and more. These mobile and wearable devices are then embedded in a network of IoT devices that interact through a device mesh to communicate, interact, share data, and analyze data throughout the globe. **Device mesh** is a connection of devices over a network where each device has the potential to be connected to any other device on a network without human intervention. IoT allows for more efficient and real-time sharing of employee and productivity data and provides new opportunities for businesses, but it also brings with it risks. Consider the following example

suggested by Zarrehparvar (2013):

> I'm imagining I walk out of my front door with my device. My device locks the door behind me. It starts my car. It pays for my coffee at Starbucks. It knows that when I get in my car and I say I'm going to Starbucks, it has my order waiting for me when I get there. It recognizes that I'm late for a meeting and changes my meeting because it knows—by my location—that I'm not going to be at the office in time to be there for my video conference meeting and it changes it to a voice call.

In this case, the devices make life more convenient for the wearer, but given that data are sent and received across the Internet, there are risks that this data can be intercepted by a third party.

The IoT is already impacting organizations, having already been adopted by 10% of organizations (Sierra-Cedar 2015). In addition, Gartner (2015) predicts that by 2018, two million employees will be required to wear health and fitness devices (e.g., FitBit) that share data as a condition of employment. Organizations thus must consider how to best deploy these devices so that they are positively received. Although it appears that a majority of employees are comfortable using wearable devices if it improves their performance, in a recent survey, over 40% indicated that they would not wear them (Cornerstone, 2013). In addition, with respect to using wearable devices for health, early indications are they can lead to better awareness of health and improved lifestyles, but it is hard to keep employees engaged in their use for more than six months (Stevens, 2015).

There are also a number of privacy and security concerns with the IoT. Wearable devices can share a lot of information about employees' performance, health, and other activities. Employees are right to be concerned about the risks associated with this information being intercepted. Consider, for example, data from a wearable device reveals that the CEO has a chronic or acute medical issue. This could negatively impact stock performance and hurt the firm's ability to compete. In addition, if an employee's personal, medical, and health information on employees were compromised (or were entered incorrectly), he or she could be stigmatized.

For example, if it was revealed that someone had AIDS, that employee might lose out on promotion or other opportunities. Imagine then if the data were incorrect and a promotion denied.

It is clear that the IoT is going to have a dramatic impact on the practice of HR in the coming years, likely in ways we have yet to think of. As more and more data are collected, we can also expect that governments will begin to assess and make recommendations about the legality of this data collection. For these reasons, we recommend that before implementing any wearable or IoT-based program, your organization should get employees' consent and inform them about how and what data will be used.

Open-Source Software

As discussed throughout this text, traditionally, vendors developed software following a very structured approach. Software is often released in formal cycles, and, in each cycle, new functionality is added and errors from previous releases are fixed. Each cycle, then, culminates with a release date. In addition, vendors will often stop supporting older releases as they place more resources into newer releases. The software developed in this way is copyrighted, and the source code is neither open nor available for others to enhance. This approach to software development has been criticized by some developers as increasing the cost of software, stifling innovation, and encouraging developers to make previous versions obsolete, thus requiring companies to upgrade.

In response to these concerns, some software developers have agreed to a different approach to the development of software called open source. In an open-source approach to software development, the developers make the source code available for anyone to see and to change. This means that other companies or developers can then expand on the product or easily develop complementary products. **Open-source software** also costs much less than traditional (or proprietary) software and is sometimes provided for free. Open-source products are available for a wide variety of organizational needs. Examples of open-source products include Linux (an operating system), Apache (a Web server that plays a central role in the operation of the Web), OpenOffice (a free alternative to Microsoft Office), and MySQL (a

database product). The major risk facing organizations considering open-source adoption is the long-term viability of the product, as the continued success of these products depends on the continuing interest of the developers. But in many areas where needs are common across organizations, open-source products are finding strong support.

Open-source software should grow in importance for human resources in the near future. For example, many HR vendors such as Workday and Journeyx use open-source software in support of their product offerings. In addition, other companies are offering open source software to support functions such as time and attendance (TimeTrex), benefits (Zenefits), and core HR (OrangeHRM, Apptivo, freeHR). Central to these companies' business model is not the sale of the software itself, but instead the customization and support services they provide. The business model thus changes from one of continual updates for profit to one of developing a long-term relationship with clients.

An Evolving Industry

As we will likely say in every revision of our book, the HRIS market continues to evolve. Markets and industries are cyclical. Innovations drive change and create new opportunities. In response to these opportunities, new companies emerge that specialize in new innovations. For example, when enterprise resource planning (ERP) vendors first started introducing their products 15+ years ago, new opportunities arose for consultants, implementation partners, and other services surrounding their use. Over time the markets consolidated and vendors merged, leaving a few dominant HR ERP vendors such as SAP, Oracle/PeopleSoft, ADP, and Lawson. This time, cloud-based HR software is driving industry change. For example, in the last few years, SAP has purchased SuccessFactors, Workday has established a strategic alliance with Salesforce.com, Oracle has purchased Taleo, and IBM has purchased Kenexa. In addition, mergers and acquisitions are continuing in the consulting area surrounding cloud-based HR. For example, OmniPoint Consulting, a specialized firm focused on Workday implementations, was recently purchased by Aon-Hewitt to bolster its Workday offerings. Because of these changes to the HRIS industry, it is important that you consider carefully a vendor's viability as you assess potential HR software options.

Evolving HRIS Technology Strategy

Along with the consolidation of the vendor and consultant landscape, organizations are reconsidering their HR delivery models. One of the challenges facing organizations is that many of them have historically chosen disparate best of breed approaches where different vendors are added to current offerings, leading to a situation where organizations have added technology support for automating more HR processes (as discussed in Chapters 10–15). But this has created two issues for organizations. First, organizations are faced with managing the complexity of working with multiple vendors. Second, although organizations may have added a large amount of technology to their processes, they have realized that they have not really reflected as to whether they are actually more effective in the delivery of HR services. Therefore, in the next few years, we believe that organizations will spend more time and effort assessing the most effective portfolio of HR technology, and many will likely consider moving to some type of consolidated technology platform. Our assessment is supported by Towers Watson research that suggests that within the next few years, nearly half of the organizations surveyed are planning to consolidate or reorganize their HR function (Towers Watson, 2012).

HRIS Moves to Small Businesses

The last trend in HRIS that we focus on is the expanding options for small businesses. As recently as five years ago, the idea that a small business would be able to adopt a full-scale HR ERP would have seemed unlikely. But these days, products are being made available at costs that make their attractiveness to small businesses high. One of the reasons for this change is the availability of cloud-based solutions. Companies no longer need the capital to invest in both hardware and software, and the IT expertise to manage the HRIS. Now, much of the risk and expertise for managing the hardware and software is with the vendor. Therefore, small businesses are not only able to afford access to the software, but they are also not burdened by the technological overhead required to implement legacy systems. Now, no company is too small to have their employees supported by HR software. Myco Portal even offers a time and attendance module for companies with fewer than 10

employees!

Future Trends in Workforce Technologies

The many future trends in the HRM, IT/IS, and HRIS fields can easily lead to confusion for organizations, management, vendors, and employees. A solution to this confusion has been proposed by Carden (2009), and we agree wholeheartedly: technology should serve strategic goals. The increasing competition by organizations to improve their profitability has often led to the conclusion that *new technology will solve these issues,* but the reality is more complex than that. Organizations that are most successful are those who are able to leverage the technology that most closely links to a strong business and HRM strategy. With the recent global recession, the increasing pressure to remain competitive and survive has led to companies adopting technology to carefully diagnose what *strategic goals* the adoption of technology could support. “Even the most sophisticated software is rendered powerless without a solid business strategy behind it” (Carden, 2009, p. 20). Thus, as we consider the changes in workforce technologies, it is important to keep in mind that how effectively organizations are able to harness the power of these new technologies will depend on how well they link it to their HR strategy.

Summary

As noted early in this chapter, forecasting the future is very difficult. One reason for this difficulty is that the field of HRIS is not just about what might become technically possible. It is, essentially, about systems that serve humans and human enterprise. Students focusing on understanding the field of HRIS must never forget the human issues involved in developing and implementing an HRIS. The field of HRIS continues to evolve, and it is important for those studying it not only to understand what is occurring today but also to look at the environmental and technological forces that will affect it in the coming years. If there is one central theme of our look toward the future, it is the importance of HR policies and programs matched with organizational change and technology; this alignment will have the greatest impact on the future success of HRIS and the organizations investing in these systems. For example, one of the findings from the CedarCrestone (2010)

survey was the emphasis on change management—to which an entire chapter of this book was devoted (see Chapter 6). Technology is not a substitute for managerial competence and employee discretionary behavior (Armstrong, 2005). It can only be a messenger, not a message. It is also impractical to expect information systems to supplant the soft functions of the HR department, such as an online electronic tutor replacing a good executive coach (Stanton & Coovert, 2004). In sum, technology is extremely important in the field of HRIS, but people are simply more important.

Key Terms

Student Study Site

Visit the Student Study Site at **study.sagepub.com/kavanagh4e** for additional learning tools such as access to SAGE journal articles and related Web resources.

Glossary

360° appraisal
Any system in which employee performance is rated by managers, peers, subordinates, and (possibly) outsiders and the employee as well.

Ability test
A standardized test of personal skills. Examples of ability tests include the Watson-Glaser Critical Thinking Appraisal that measures critical thinking skills, the Scholastic Aptitude Test (SAT), the Miller Analogies Test (MAT), and the Graduate Record Examination (GRE).

Action query
A type of query that performs an action on a table, such as adding, updating, or deleting data.

Adaptable workforce
A type of workforce where employees are trained to complete multiple tasks and jobs and can effectively fill many different roles in the organization.

Adaptive maintenance
Type of system maintenance that focuses on changes to the software made necessary because of changes in the business or environment.

Administrative process efficiency
This kind of HR efficiency refers to the capacity to conduct existing HRM processes accurately and on time, while minimizing costs. Centralizing certain HRM processes, for example, recruiting new employees, offers process efficiency benefits.

Aesthetic features of a website
The overall stylistic or innovative features of a website, such as contrasting colors, pictures, animation, and playfulness, that keep the user engaged while navigating through multiple Web pages.

Affirmative action plan (AAP)

A written report detailing how an employer actively seeks to hire and promote individuals in protected classes. For employers with government contracts totaling $50,000 or more, the Office of Federal Contract Compliance Programs (OFCCP) requires that an AAP be completed.

Age Discrimination in Employment Act (ADEA)

The 1967 federal legislation prohibiting illegal discrimination in employment against individuals 40 years of age and older.

Alliance programs

Partnerships between major HRIS vendors and small, independent vendors that allow organizations to implement fuller (or total) solutions for companies.

Americans with Disabilities Act (ADA)

The 1990 federal legislation prohibiting illegal discrimination in employment against individuals with disabilities. A disability is defined as a physical or mental impairment that substantially limits one or more major life activities.

Analysis phase

The phase in the systems development life cycle where an organization's current capabilities are documented, new needs are identified, and the scope of an HRIS is determined.

Antidiscrimination laws

Laws enacted to prohibit unfair hiring practices that discriminate against people in protected groups, such as women, racial/ethnic minorities, and older individuals.

Applicant-tracking system (ATS)

A module in an HRIS that supports e-recruiting and the processing of applicants electronically.

Application service provider (ASP)

A third-party firm that hosts and provides access to a bundle of one or

more software application services from a central location to multiple clients via the Internet. Clients pay a subscription fee, which generally entails data management and software upgrades. ASPs are often considered a cost-effective way for organizations to manage their information requirements. Many learning management systems are ASP based; that is, access to applications is available through ASPs.

Asynchronous communication

Two-way communication in which transmission does not take place in real time. Examples include e-mail or Internet discussion forums. It is useful for collaboration across different time zones.

Attraction or retention awards

One-time rewards used to attract prospective employees or to persuade existing employees to remain with the organization.

Attributes

Characteristics of an entity, for example, attributes of an employee entity may be employee ID, last name, first name, phone number, and e-mail address.

Average employee contribution (AEC)

HR metric that is assessed as total gross profit divided by the number of employees or full-time equivalents in the firm.

Backsourcing

The effort to bring functionality that had previously been outsourced back in-house.

Balance-sheet approach

An approach for expatriate compensation that has as its goal the maintenance of a home-country living standard plus a financial inducement for accepting an international assignment.

Balanced scorecard

A means of measuring strategic organizational performance that gives managers a chance to look at their company from the perspectives of stakeholders, including external customers, employees, and

shareholders.

Bandwidth
The rate and volume of data transfer, measured in bits per second.

Base pay
The pay received by employees for doing their jobs, not taking into account overtime or bonuses. Base pay for some workers is stated in terms of pay per hour; for others, it is stated in terms of annual pay.

Benchmarking
(also known as *best-practice benchmarking* or *process benchmarking*)
A process used in management, and particularly in human resource management, to evaluate various aspects of the HR function, both activities and programs, usually within a firm's own market sector.

Benefit magnitude
The size, or magnitude, of the benefits to be gained by implementing an HRIS.

Best of breed (BOB)
An approach to acquiring HRIS capabilities where the company will pick the best application to support each functional area of HR. Thus, the technology architecture combines the best-fit products from multiple vendors.

"Best-fit" approach to strategic HRM
This is an approach to strategic HRM where the organization adopts the practices that work most effectively for it rather than adopting industrywide best practices.

Best-fit learning event model
A model of the conditions necessary for the most successful learning outcomes.

"Best-practice" approach to strategic HRM
This is an approach to strategic HRM used by researchers where organizations adopt industry-recognized best practices and use them in

their organization.

Big Data

A collection of very large and complex data, created by transaction processing systems, which are mined for hidden patterns of relationships regarding customers or employees.

Blended learning

As the term implies, it "blends" various approaches to learning and could incorporate, for instance, face-to-face, formal, informal, and online learning methods.

Bloom's taxonomy

A taxonomy of learning named after Benjamin Bloom that classifies levels of learning based upon the complexity and specificity of the training.

Bring your own device (BYOD)

Workplace use of employee owned technology devices such as smartphones and tablets.

Business application

A set of one or more computer programs that serve as an intermediary between the user and the DBMS (database management system), while providing the functions or tasks that the user wants performed.

Business intelligence (BI)

A broad category of business applications focused on helping organizations and HR collect, store, and analyze data. BI applications include tools such as decision support systems, query and reporting, statistical analysis, and data mining.

Business process reengineering

The analysis and redesign of work flow to improve an organization's efficiency and effectiveness.

"Caretaker" functions

The early phase in the development of human resource management

where HR was primarily involved in clerical record keeping of employees.

CBA guidelines

A set of guidelines helping the cost-benefit analysis (CBA) team approach a CBA that provides them with an improved likelihood of making the best financial decision regarding an investment in an HRIS.

Change agent (also known as change leader)

A person responsible for leading an organizational change or someone who is influential and can communicate and motivate others to accept a change by informal means.

Change management

A structured approach to changing the mindset and perceptions of individuals.

Cloud computing

The delivery of software functionality over the Internet where HRIS functionality is delivered to companies via the Web. For the company, there is no hardware and software to install. It is a specific type of software as a service.

Collaborative technologies

Software and hardware, such as groupware (electronic meeting software), instant messaging, e-mail, and so on, that help groups (and trainees) communicate, interact, make decisions, and learn more effectively.

Commercial off-the-shelf (COTS) software

Prewritten or developed software or hardware products that already exist for purchase.

Common attributes of talented individuals

A set of skills common to higher-performing and more talented employees.

Computer virus

A software program that inserts a copy of itself into another program and causes harm to a computer by altering data, erasing files, or other damage.

Computerized assessments

A selection test or batter that is administered on a computer or over the Internet.

Consolidated Omnibus Budget Reduction Act (COBRA)

A federal statute governing health care. It is most well known as the statue that provided opportunities for employees to maintain insurance even if a qualifying event would cause them to lose the company sponsored insurance.

Content information

The degree to which the website hosts relevant information that the user deems valuable and informative in nature.

Context-level diagram

The highest-level data flow diagram that contains the least amount of detail. It is used to represent the system, its boundaries, and the external entities that interact with the system.

Core competency

A combination of some set of knowledge, skills, and abilities. Many industrial psychologists equate competencies with traits.

Corporate brand management

Long-term talent management strategies also need to be linked to corporate strategy. One very important strategy that must be maintained despite the state of the marketplace is corporate brand management. It has been confirmed repeatedly that the best labor talent is linked to highly regarded corporations that have excellent brand images.

Corporate culture

An organization’s collective values, beliefs, experiences, and norms that shape the behavior of the group and the individuals within it.

Corrective feedback

In performance management, information fed back to an employee pointing out the discrepancy between observed performance and a performance standard. The purpose is to solve any performance problem and increase performance level.

Corrective maintenance

Type of system maintenance that focuses on fixing errors in the software.

Cost-benefit analysis (CBA)

The financial analysis of the benefits and costs of implementing a new or upgraded system. Important calculations include the break-even point, net present value, return on investment, and the cost-benefit ratio.

Cost-benefit ratio (CBR)

A measurement that expresses the benefits of an HR project (e.g., implementation of an HRIS) as the numerator and the costs as the denominator; thus, values greater than 1 indicate a favorable ratio.

Countermeasures

Identification of mechanisms that can be used to protect data.

Cross-cultural suitability

This term refers to an attribute of an expatriate. It could include language ability, cultural empathy, adaptability, and a positive attitude toward the assignment in the specific country being considered.

Cross-tab query

A type of query available in MS Access that calculates a sum, average, or other type of aggregation and then groups the results by two sets of values.

Cultural environment of countries

A shared set of beliefs, customs, practices, and behaviors within a country.

Cultural norm

A specific belief, attitude, or behavior that is defined as right or wrong, correct or incorrect, within a given culture in a country. Cultural norms are part of the cultural environment of a country.

Culture

The shared beliefs, customs, social patterns, and values of a people, region, race, or religious group.

Culture shock

The feeling of uneasiness and discomfort experienced when going from one culture to another, as well as the adjustment that occurs in a relatively short time when moving from one country to another.

Customization

The modification of a software product to match specific organizational processes or needs.

Cyber-terrorism

Politically motivated use of technology to do severe harm or disruption in society.

Dashboards

A type of interface for reporting HR data that uses a visual, or graphical, representation of key HR data for view by managers.

Data accuracy

The extent to which the value stored for an object is correct.

Data flow

DFD (data flow diagram) component that represents the flow of data within the system. An arrow indicates the direction of flow, and the name of the flow indicates the type of data.

Data flow diagram (DFD)

Graphical tool that represents the flow of data through a system and the various processes that manipulate or change the data.

Data migration

The process of transferring employee data between storage types and computer systems or software applications.

Data mining

The sophisticated statistical analysis of large datasets to identify recurring relationships and patterns. For example, data mining an employee database might reveal that most employees reside within a group of particular ZIP codes.

Data perspective

A view of an HRIS that focuses on an analysis of what data the organization captures and uses, and on the definitions and relationships of the data, while ignoring how or where the data are used by the organization.

Data store

A DFD (data flow diagram) component that represents the temporary or permanent storage of data within the system. A data store is represented by an open-ended rectangle in the data flow diagram.

Data warehouse

A special type of database that is optimized for reporting and analysis.

Database management system (DBMS)

A set of software applications that supports the processes of creating and managing the physical database, managing the data in the database (e.g., insert, read, update, and delete data from the database); maintaining data integrity and security; and preventing data from being lost by providing backup and recovery capabilities.

Decision support systems (DSS)

Software applications that are designed to support business professionals in their decision-making process. One such approach is the use of "what-if" analysis through which managers are able to review and compare various business scenarios and assess the benefits of one problem solution against other solutions.

Denial-of-service (DoS)

A technique that attempts to make a computer, network, or service unavailable for legitimate users, often by flooding it with external communication requests.

Design phase

The phase in the systems development life cycle where the detailed specifications for the final system are laid out and final vendor evaluation and selection occurs.

Desired information goals

Ensuring that data are kept confidential, have not been manipulated, and are available to those who are authorized to access it.

Device mesh

A network typology where each device has the potential to be connected to any other device on the network without human intervention.

Direct benefits

Benefits accruing from an information system that can be measured objectively in dollars.

Direct costs

Costs associated with the implementation of a system that can be measured objectively in dollars.

Direct costs of expatriate failure

These costs include the actual money spent on selecting and training, relocation costs for the expatriate (and family), and the salary of the expatriate.

Direct estimation

An approach to estimating indirect benefits of a new HRIS in which the analyst estimates the value of any indirect benefits of the HRIS.

Direct report

The direct report is the employee whose job performance is being evaluated. At the broadest level, this definition of the performance would include any employee who fills the job position, that is, it

describes the job performance expectations for any position in the organization.

Discrete HRO
The outsourcing of only discrete, or selected, HR functions to third-party providers.

Disgruntled employee
An employee who has grievances against an employer and who believes that these grievances cannot be resolved.

Distance learning
The delivery of training over the Web; see also e-learning.

Diversity of the applicant pool
The extent to which the applicant pool contains a variety of applicants from different ethnic/racial backgrounds, ages, and gender.

Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010
A federal U.S. law that significantly strengthened the regulation of financial institutions and markets.

Domestic HRM
The practice of human resources in organizations that only operate in one company.

Economic feasibility
System feasibility assessment tool that focuses on the financial and economic benefits and costs that a new system would bring to the organization.

e-learning
A type of training where trainees are often geographically distributed, communication and interaction occur via technology, and the training is provided in online repositories. Individuals can access the material via computers, kiosks, mobile devices, or other technology.

Electronic data processing (EDP)

The automation of business processes to perform routine, standardized sets of transactional activities.

Electronic human resource management (eHRM)
The implementation and delivery of HR functionality enabled by an HRIS that supports employees and their people-related decisions.

Employee data warehouse
A centralized repository of a company's electronic data, specifically designed to facilitate reporting and analysis for decision making.

Employee engagement
The extent to which an employee is emotionally connected and committed to an organization.

Employee master file
A record of all relevant employee information, central to all core HRIS functionality.

Employee participation and involvement
Amount of time and effort an employee places into the analysis, design, and implementation of a new HRIS.

Employee Retirement Income Security Act (ERISA)
A federal U.S. law that established fiduciary standards governing private industry pension plans.

Employee self-service (ESS)
A structural approach to HR administration through HR portals that provides a means for employees to access their personal information and HR services and information.

Employer Information Report EEO-1
A report required to be filed annually with the EEO that lists employee data categorized by job category, race/ethnicity, and gender.

Employment brand
An organization's well-known values or distinctive image and culture

(think Southwest Airlines or Apple). A company often sets itself apart from competitors by means of its employment brand.

Enterprise resource planning (ERP) software

A set of integrated applications, or modules, that carry out the most common business functions, including human resources, general ledger, accounts payable, accounts receivable, order management, inventory control, and customer relationship management. ERP modules are integrated primarily through a common set of definitions and a common database.

Entity (Data Flow Diagram)

An external person, department, or agent that interacts with the system through receiving or sending data. An entity is represented as a square on the DFD (data flow diagram).

Entity (database)

An object or thing of significance to an organization that has multiple characteristics of interest to the organization. For example, employees, dependents, managers, and health insurance plans are examples of entities in the human resources context.

Equal Employment Opportunity (EEO)

The condition in which all individuals have an equal chance for employment, regardless of their race, color, religion, sex, age, disability, or national origin, as established in federal legislation and the U.S. Constitution and its amendments (13 and 14).

Equity Theory

A work motivation theory based on the perceived fairness of the employee–employer exchange.

Estimating labor demand

The process through which the firm estimates its future labor needs.

Estimating labor supply

The process through which the firm identifies from where labor can be sourced; it is assessed both from an internal (within the organization)

and external (outside the organization) perspective.

European Union (EU)
An economic and political union of a number of European countries.

Evaluation
The phase in needs analysis where the data gathered are reviewed and assessed to create a clear picture of the current and desired states.

Exempt workers
Not subject to the provisions of the Fair Labor Standards Act. See *nonexempt* workers.

Expatriate
A parent-country national employee assigned to a subsidiary of a multinational enterprise in another country.

Expatriate failure
The return of expatriates prior to the completion of their overseas assignments.

Exploration
The phase during needs analysis where the analyst gathers detailed data about current HR processes.

eXtensible Markup Language (XML)
A markup language or set of rules for encoding an electronic document.

Fair Labor Standards Act (FLSA)
The 1938 federal legislation that established a minimum wage for hourly workers, set the rate of pay for overtime work beyond the defined workweek of 40 hours, prohibited oppressive child labor by restricting hours of work for children below 16 years, and listed hazardous occupations too dangerous for children.

Family and Medical Leave Act (FMLA)
The federal legislation that requires organizations with 50 or more employees to provide up to 12 weeks of unpaid leave after childbirth or

adoption, to care for a seriously ill family member, or for an employee's own serious illness.

Federal Insurance Contributions Act (FICA)
A federal payroll tax that funds Medicare and Social Security.

Fidelity
The degree to which a selection test accurately simulates a real business situation.

File-oriented data structures
Data-processing systems that performed record-keeping functions that mimicked the existing manual procedures. Thus, electronic data were stored in computers much the same way as they were stored in paper-based filing systems.

Firewall
A device or set of devices that will permit or deny all computer traffic between computers with different security requirements based on a set of rules.

Focus groups
A diverse group of organizational stakeholders that are brought together to provide data to analysts in support of the needs analysis of a new or upgraded HRIS.

Force-field analysis
A procedure to understand the forces during any organizational change that focuses on the forces that drive or support a change in an HRIS and the forces that will inhibit the change.

Foreign key
The primary key from one table that is stored as an attribute in another table. It represents a common key between two tables and is used to form a relationship between the two tables.

Gamification
The use of game design elements in nongame contexts.

Gap analysis

An assessment of the differences between the current state of affairs in the organization and the desired future state.

Gleicher's change equation formula

A formula developed by David Gleicher that helps an organization assess its degree of readiness for change.

Global corporation

A form of business organization where an international company locates operations in multiple countries and provides flexible and customized products for each country's market.

Globalization of business

The process of integrating business operations and free flow of trade and competition across international borders.

Goal-setting theory

A work motivation theory with the fundamental tenet that goals and intentions are responsible for human behavior on the job.

Going-rate approach

An approach to expatriate compensation that ties the base salary for international employees to the salary levels in the host country. For example, an expatriate would earn pay that is comparable with that earned by employees in the host country.

Hackers

Individuals who access a computer or computer network unlawfully.

High-performance system

An approach to managing employees that focuses more on empowerment, engagement, and autonomy of employees rather than managing as a form of controlling employee behavior to ensure compliance.

Host-country approach

A form of compensating an expatriate based upon the salary levels in the

host country.

Host-country nationals (HCNs)
Employees of the multinational enterprise who are citizens of a country in which a branch or subsidiary is located, but where the organization's headquarters is located in a different country.

HR balanced scorecard
An approach to measuring the value of the human resource function by identifying the key value-added HR activities that contribute to business goals, measuring them, and evaluating the effectiveness of HR through them.

HR metrics
Measures used to evaluate the functioning of HR programs and as benchmarks for the total HRM department.

HR workforce scorecard
See **HR balanced scorecard**.

HRIS functionality
The number of programs or functions—such as recruiting, compensation, and job analysis—that are operational using the specific HRIS configuration, as well as the features of these programs that enhance their usability and capacity to affect outcomes.

Human capital
This encompasses "the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being" (OECD, 2001, p. 18).

Human capital management (HCM)
Another term used for talent management.

Human resource information systems (HRIS)
Systems used to acquire, store, manipulate, analyze, retrieve, and distribute information regarding an organization's human resources.

Human resource management (HRM)

An integral part of the organizational system dealing with strategies, policies, and practices that aims to attract, develop, and retain high-quality intellectual capital.

Human resources outsourcing (HRO)

Moving a company's human resource function outside the organization to an external company.

Human resources planning (HRP)

A systematic approach to estimating the future needs of a company for human capital in terms of labor and supply.

HyperText Markup Language (HTML)

The predominant markup language for Web pages. It provides a means to describe the structure of text-based information in a document—by denoting certain text as links, headings, paragraphs, lists, and so on—and to supplement that text with interactive forms, embedded images, and other objects.

Implementation costs

The costs associated with implementing a new HRIS.

Implementation phase

The phase in the systems development life cycle where an HRIS is built, tested, and readied for actual rollout.

Implementation team

The team working with the project manager to complete the actual software implementation.

Incentive pay

Compensation provided for some performance achievement. Unlike merit pay, it is not added to base pay but is a one-off reward that must be re-earned to be received again.

Indirect benefits

The benefits associated with the implementation and use of a new HRIS

that cannot be measured with certainty (also called intangible benefits). These can be factors such as improved HR reputation or employee morale.

Indirect costs

The costs associated with the implementation and use of a new HRIS that cannot be measured with certainty (also called intangible costs). These can be factors such as lost employee productivity or a short-term loss of HR goodwill as employees learn to use the new system.

Indirect costs of expatriate failure

Indirect costs are harder to quantify than direct costs, but they could include loss of market share in the country, negative reactions from the host-country government, and possible negative effects on local employee morale.

Individual development plan (IDP)

A performance tool that helps facilitate employee performance and development, to reach both short-term and long-term performance goals.

Individual retirement account (IRA)

A type of retirement account that allows individuals to invest for retirement while providing tax benefits to investors.

Information privacy

A human value consisting of four elements that refer to human rights, namely, solitude, anonymity, intimacy, and reserve. Information privacy concerns come to play wherever personally identifiable information is collected, stored, and used.

Information security

Ensuring the confidentiality, integrity, and availability of information.

Information

According to the *Oxford English Dictionary,* information is the result of informing or giving form or shape to the mind. Information provides structure and meaning to abstract data and is of potential value to organizations.

Infrastructure as a service

A software service that provides access to computing resources such as hardware, software, and servers.

Internal assessment

A way of assessing indirect benefits that estimates them based upon current organizational metrics.

Internal rate of return (IRR)

A capital budgeting metric that is the annualized effective compounded rate of return when the net present value of an investment is zero; it is an indicator of the efficiency of an investment.

International Association for Human Resource Information Management (IHRIM)

The professional organization for specialists in both human resources and human resources technology.

International corporation

A domestic corporation that expands its business (e.g., sales of products or services) into markets outside of its own country.

International human resource management (IHRM)

The profession and practice of HRM within an international or global corporation.

Internet of Things (IoT)

A network of objects with embedded sensors and other technology that allow the objects to collect and exchange data.

Internet-based training (IBT)

Any Web-based training (WBT) or online learning or education.

Interview

A meeting with an employee where an analyst will ask a series of questions about HR processes and needs.

ISO/IEC 27000

An internationally agreed upon set of standards governing information security management.

IT architecture

The basic hardware, software, and networking infrastructure of the organization.

Job analysis

The process of systematically obtaining information about jobs by determining the duties, tasks, or activities of jobs, from which a set of KSA (knowledge, skills, and abilities) can be estimated.

Job description

A written summary of the duties, tasks, responsibilities, and activities that define the working contract between the employee and the organization.

Job evaluation

A rating or ranking system designed to create an internal hierarchy of job value. In many organizations, job evaluation results form the basis of the salary structure.

Kirkpatrick's evaluation taxonomy

A four-level model for evaluating the effectiveness of learning; levels include employee reactions to training, employee learning, change in behavior, organizational results.

Knowledge management (KM)

A process for identifying, creating, collecting, processing, distributing, and using knowledge.

Knowledge, skills, and abilities (KSA)

The requirements for each job in the organization. These provide the basis for HR planning and for the recruitment and selection of new employees.

Knowledge test

A multiple-choice training posttest of knowledge of the tools, machines,

and equipment used at a factory, designed to measure how well the new hire has learned essential job information taught in classroom training.

Kotter's eight-stage change model

A model of organizational change developed by Dr. John Kotter that outlines eight steps that should be completed in order to manage change successfully and avoid the common pitfalls that have beset failed change programs.

Learning content management system (LCMS)

A software application that supports the creation, management, and implementation of training content.

Learning management system (LMS)

Software application that supports the administrative aspects of the training including scheduling, tracking, reporting, skills gap analysis, and resource allocation.

Learning organization

A company that values, supports, and facilitates employee learning and development.

Learning, training, and development (LT&D)

The HR function focused on improving the knowledge, skills, and performance of employees, groups, and the organization.

Legacy computing system

A large, outdated computer system or application that is still being used, often because of the high cost of replacing such a system. The cost of maintaining such systems, which increases over time, is often a key driver for a new system investigation.

Legal and political feasibility

A system feasibility assessment tool that focuses on the legal issues associated with the implementation of a new system and any political impacts that would emerge from its use.

Level 0 diagram

The first-level DFD (data flow diagram) that outlines the major processes (functions) of the system, the basic sequence of these processes, the basic data stores, and the external entities that interact with the system.

Lewin's three-step change model

One of the earliest and key contributions to organizational change, Lewin's framework serves as a general model for understanding planned change.

Load balancing

A technique in computer networking that spreads work between computers, network links, or CPUs in order to get optimal resource utilization from the network.

Logical design

A phase in the SDLC (systems development life cycle) in which a new system is designed without regard to the technology (e.g., hardware, software, networking) in which it will be implemented.

Logical model

A model of the system that graphically illustrates what the system does, independent of any technological architecture (e.g., hardware, software, networking).

Maintenance phase

The phase in the systems development life cycle where the implemented HRIS is refined and updated to prolong its useful life, to fix minor errors, and to improve functionality.

Management information system (MIS)

A type of information system designed to provide detailed data to aid managers in performing day-to-day activities.

Management reporting systems (MRS)

Software that (1) focuses on information aimed at middle managers; (2) integrates transaction-processing data by business function such as manufacturing, marketing, and human resources; and (3) provides

reporting of summarized data.

Manager self-service (MSS)
Within an HRIS, it is a portal that allows managers to access and manage employee and organizational data related to subordinates, and to perform administrative tasks associated with managing these employees.

Market benchmarking
A compensation practice designed to provide labor market rates for jobs in an organization. The labor markets may be local, regional, national, or global. The underlying rationale is that an organization should pay for a job roughly what other employers in the relevant market pay to attract and retain employees.

McCumber Cube
A graphical model, or framework, of the architectural approach used when establishing or evaluating organizational security measures.

Media richness
A framework for explaining the extent to which a medium can communicate or reproduce information; focuses on a medium's ability to convey factors such as content, social cues, and feedback.

Microblogging
A form of blogging that allows users to exchange small amounts of information via sentences, images, or video links.

Middleware
The general term for any computer programming that serves to "glue together" or mediate between two separate and often already existing programs.

Mobile learning
The delivery of training/learning over mobile devices.

Multinational corporation
A company that has expanded production and distribution of products or services into multiple countries to capitalize on lower costs.

Multinational enterprise (MNE)

Any organization that has a business presence in more than one country. A multinational enterprise is also called a multinational corporation.

Multiprocess HRO

An approach to outsourcing HR administration, also known as *comprehensive* or *blended services outsourcing.* This approach involves outsourcing to niche, third-party providers all of one or more related HR functions, for example, recruitment and selection or defined and 401(k) retirement plan administration.

Nadler's congruence model

An organizational performance model that is built on the view that organizations are systems and that only if there is congruence ("fit") between the various organizational subsystems can we expect optimal performance.

Navigability (of a website)

The overall ease with which a user can browse through multiple Web pages to locate topics of interest.

Needs analysis

In the analysis of an HR system, the process by which an organization determines and documents its current and future system needs. These needs become the targets or goals that the new system will attempt to satisfy. See also **requirements definition**.

Needs analysis planning

A stage in needs analysis that prepares the firm to investigate the current and new system.

Nonexempt workers

Subject to the requirements of the Fair Labor Standards Act. Employers of nonexempt employees must pay them at least minimum wage, pay overtime of 1.5 times the base pay rate for every hour worked in one week in excess of 40 hours with 2.5 allowed for meals, keep track of hours worked, and file reports with the U.S. Labor Department demonstrating compliance.

N-tier architectures

The software and hardware configurations in which databases, applications, and other resources are distributed among many different computers around the world.

O*Net database

A database containing job descriptions for a large number of jobs in a variety of industries. It is a good starting point for a job analysis project.

Observation

The phase in needs analysis where the analyst observes the current processes and systems.

Occupational Assessor® software

Software developed and supported by the Economic Research Institute (ERI), which was founded in 1987 to provide compensation research to organizations and consultants in the form of published reports and survey software.

Occupational Safety and Health Act (OSHA)

The 1970 law that authorizes the federal government to establish and enforce occupational safety and health standards for all places of employment affecting interstate commerce.

Office of Federal Contract Compliance Programs (OFCCP)

An office of the U.S. Department of Labor that focuses on ensuring that organizations contracting with the federal government are in compliance with the relevant non-discrimination laws and regulations.

Offshore ownership

A form of offshoring where the company moves operations overseas, but retains ownership of the offshore operations in some form.

Offshoring

An organization’s use of groups outside of its home country (e.g., India, Ireland, or China for U.S. corporations) to provide services (e.g., HR call centers) to achieve strategic organizational goals.

Off-the-job training
A formalized training program where the training occurs outside of the employee's normal work context.

Online recruiting
(also known as *Web-based recruiting, Internet-based recruiting, cyber recruiting,* and *e-recruiting*) The use of the Internet in attracting job seekers to a company's job openings.

Online tests
The administration of a selection test over the Web.

On-the-job training
Informal training conducted while an employee is doing her or his job.

Open-source software
An approach to software development in which the developers make the source code available for anyone to view, adapt, or change.

Operating systems
Software that manages the interaction between the computing hardware and software and provides services common to all applications.

Operational effectiveness
Extent to which operational practices are of high quality and are designed around best practices.

Operational experiments
One of the most effective methods for developing the evidence on which to base managerial decisions.

Operational feasibility
System feasibility assessment tool that focuses on how well the new system will fit within the organization and can be used to consider issues such as development schedule, extent of organizational change, and user responses to the system.

Optical character recognition (OCR)

The translation of images of handwritten or printed text into computer-editable text, usually by a scanner.

Organizational culture

A concept defined as a complex set of shared beliefs, guiding values, behavioral norms, and basic assumptions acquired over time that shape employees' thinking and behavior; they are part of the social fabric of the organization.

Organizational learning

The process of creating, managing, and transferring knowledge in the organization.

OSHA Form 300

Annual report required by OSHA where an organization reports all work-related injuries and illnesses.

OSHA Form 300A

A summary report which displays total illnesses and injuries that occurred during the year, which is posted for all employees to view.

OSHA Form 301

A supplement form to the OSHA Form 300 where information is provided for each reportable injury and illness.

Outsourcing

An organization's use of an outside group to provide services—from a few services (e.g., recruiting, compensation processing) up to a broad set of services (e.g., all HR functions)—to achieve strategic organizational goals.

Parent-country nationals (PCNs)

Employees of the multinational organization (MNE) who are citizens of the country in which the parent, or headquarters, of the MNE is located.

Patient Protection and Affordable Care Act

A federal law passed in 2010 that focuses on the delivery and regulation of health care in the United States. It represents one of the most

sweeping regulatory overhauls of health care in 50 years and has large implications for businesses.

Payback period

A capital budgeting metric that calculates the number of years required for the flow of benefits returned by an investment to equal the cost of the investment.

Pension plans

a retirement plan where either the retiree receives a defined sum of money payed at a regular interval (e.g., defined benefit) or an employer makes a defined contribution to a retirement account (e.g., 401K).

Perfective maintenance

Type of system maintenance that focuses on making small changes to the system to improve performance.

Performance appraisal

A retrospective system noting how an employee has performed during a previous period. Performance appraisal data usually form the basis for merit pay.

Performance contract

An agreed upon performance standard by a manager and employee during the performance planning process.

Performance criterion

An outcome, behavior, or competency used in the performance management (or appraisal) process. Performance criteria are the factors on which an employee's performance is rated.

Performance gaps

Performance discrepancy between the current HR system, or HRIS, and the desired system.

Performance management

A managerial process designed to improve employees' job performance. Performance management is broader than performance appraisal

because it focuses on planning for performance, providing performance feedback to an employee, and rewarding changed job performance behavior.

Performance observation

The observation of workplace performance by a manager or team leader; an employee may be "observed" and performance data captured through technology or through direct observation.

Performance planning

A formal organizational process where managers and employees identify and discuss performance goals and standards for the next performance review cycle.

Perquisite

A reward based on job status. In the past, these were usually reserved for executives (corporate jet, executive dining room, special parking), but now they are frequently used as performance rewards for other workers.

Personality tests

A type of selection test that captures an applicant's personality.

Phishing

Attempting to acquire usernames, passwords, account information, or other personal information by appearing to look like an authentic source with which the victim does business.

Physical design

A phase in the SDLC (systems development life cycle) in which a new system is designed with particular focus on how the hardware, software, networking, activities, and so on will be implemented.

Planning phase

The phase in the systems development life cycle where an organization reviews the existing technological and system capabilities and develops a general plan for adapting, upgrading, or changing these systems.

Platform as a service

A software service that provides users a platform upon which they can design, test, and implement software applications.

Position analysis questionnaire (PAQ)

A research validated, structured/standardized job analysis tool consisting of 194 items that represent work behaviors, work conditions, and job characteristics.

Positive feedback

Remarks made by a manager to a direct report concerning observed performance and designed to reinforce efforts leading to high performance.

Postimplementation evaluation

An important part of the final Project Management phase is project closeout, which involves the implementation, evaluation, documentation, and maintenance of the HRIS.

Power tests

A type of test in which there is no designated time limit to create time pressure or in which the time limit is set such that most candidates will complete the test without working hastily.

Power user

The most demanding user of HRIS who will use a large amount of the system functionality.

Predeparture training

Training program for expatriates prior to taking an international position.

Predictive analysis

A form of data analysis where current and historical data are analyzed to make predictions about the future.

Preventative maintenance

Type of system maintenance that focuses on maintaining the system to reduce the risk of a system failure or to extend the systems life.

Primary key

An attribute of an entity that is used to uniquely identify a specific instance of that entity. For example, each employee has a unique employee ID and each dependent has a unique Social Security number.

Problem statement

A well-defined and succinct description of the known symptoms and cause of problems with current HR operations, and how the proposed system will address these problems.

Process

A business function or activity through which data are created, manipulated, or transformed. A process is represented on a DFD (data flow diagram) by a square with rounded edges.

Process mapping

The systematic documentation of organizational processes that directly relate to the ongoing project.

Process model

A model that represents the key business processes or activities conducted by the organization.

Process perspective

A perspective for analyzing an HRIS that focuses on the business processes and activities in which the organization engages and on how data flow through the HRIS.

Project champion

An individual or group who have the authority and status to ensure appropriate resources are applied to a project

Project charter

A planning document that defines the scope of, and provides a basic "rule book" to facilitate completion of, a software implementation project.

Project manager

The person chosen by an organization to be responsible for the planning, execution, and evaluation of an HRIS implementation project.

Project scope

The portions of the information system that need to be completely operational to satisfy the needs of the various customers, employees, and senior management.

Psychological contract

Employees' beliefs about the reciprocal obligations and promises between them and their organizations.

Psychological safety

A feeling that refers to mitigating the anxiety that people feel whenever they are asked to do something different or new. People are concerned about losing their identities, looking dumb, and losing their effectiveness or self-esteem. This anxiety can be a significant restraining force to organizational change.

Pull systems

Procedures of making information available to managers so that they can access any of it at a point in time when it will be most useful for their decision making.

Push systems

Push communications channels, such as e-mail, actively push information and analyses to the attention of managers. These channels are used for information that is time critical or of which the manager is unaware. These are excellent for getting information to decision makers.

Questionnaire

A paper or electronic set of questions produced to collect data from a large number of people.

Rapid e-learning (REL)

The delivery of tailor-made e-learning content swiftly and inexpensively to a large number of learners, and the tracking of learning progress in order to stay abreast of rapidly changing knowledge and information

needs.

Realistic culture preview
A preview of what it is like to work for an organization that highlights cultural aspects of the company such as its philosophy, value systems, history, diversity, salary structure, and benefits.

Realistic job preview
A preview of what it is like to work for an organization that shows applicants both the positive and negative attributes of a job.

Recognition award
Any reward (whether cash or noncash) with the primary purpose of celebrating the specific performance achievements of individuals or groups by publicly rewarding them.

Recruiting- and screening-oriented website
A recruitment website which has the dual purpose of both encouraging a potential applicant to apply as well as engaging in initial candidate screening.

Recruitment
An HR process whereby the organization attempts to identify and attract the most qualified and best people.

Reengineering
See business process reengineering.

Refreezing
The final phase in Lewin's change model where the new behaviors and processes are reinforced, institutionalized, and stabilized.

Relational database
A type of database that stores data in series of related tables, with each table representing one entity. Tables are related to each other through a common attribute or key.

Relationships

These are created by having the same attribute in two separate tables within the database. The relationships are created by matching the value of the attribute in each table. Most often, this is done by taking the primary key of one table and including it in the related table.

Repatriation

The process that occurs as the expatriate and family return to their homeland. It is critically important that repatriation programs be established since there is a readjustment (reverse culture shock) when individuals return to their home cultures.

Reporting metrics

A set of decisions made about what metrics to report, how to report them, and to whom they should be reported.

Reports

Formatted presentations of data that help employees and managers make business decisions. Data are drawn from a table, multiple tables, or queries.

Request for proposal (RFP)

A document that solicits potential consultants or vendors to submit proposals and bids for proposed work.

Requirements definition

A document that lists and prioritizes each requirement that the new system must meet.

Resistance to change

A common response of employees to any major change initiative; individuals reject all or part of the change and strive to maintain the status quo.

Resource-based view

A theory about organizations that suggests that the value of the firm is based upon its physical, organizational, and human capital.

Return on investment (ROI)

A capital budgeting metric in which the flow of benefits that result from an investment is compared with the cost of the investment, usually in the form of a ratio, using the cost of the investment as the denominator. ROI is generally expressed as a percentage of the *total benefits less total costs over the total costs, and it is usually determined by the following formula: $$\frac{Total\ Benefits - Total\ Costs}{Total\ Costs} * 100$$

Rootkit

A type of virus that hides in the operating system and causes viruses to appear as necessary files.

Sarbanes-Oxley Act (SOX)

A 2002 U.S. law that increased accounting and finance independence and reporting standards to better protect investors from fraudulent accounting activities.

Scientific management

A management theory that focuses on the application of engineering and science principles to improve workflows and efficiency in production.

Scope creep

Enlargement of original project scope.

Security breaches

Illegal access to private data, services, networks, or devices by getting around security protections.

Select query

This query allows you to retrieve data stored in one or more tables in a database.

Selection procedures

The tools used to help an organization choose among candidates or employees in a hiring or promotion decision.

Selection ratio

The number of candidates who, based on the assessment, are chosen for the job divided by the number of candidates who are assessed.

Self-selection
The choice of a potential applicant to apply or not to apply for a position.

Self-service portal
See employee self-service.

Semantic level
When considering the interoperability of systems, it is the level at which data share meanings across different applications.

Service-oriented architecture (SOA)
A structure for organizing and utilizing distributed computing capabilities that may be under the control of different ownership domains.

Shared-service center (SSC)
A technology-enabled centralized group designed to provide excellent service to internal customers at reduced costs.

Short-term tactical strategy
A time-limited talent management strategy where the firm quickly adapts to a rapid change in market conditions.

Shoulder surfing
With respect to social media it is a request made by a manager or supervisor for an employee or applicant to provide the organization access to their social media accounts by entering their password.

Simplified employee pensions (SEPs)
A defined contribution pension plan that allows a small business or self-employed individual to contribute a percentage of salary, tax free, to a retirement account.

Social media

A form of electronic communication through which users create online communities to share information, ideas, personal messages, and other content such as videos.

Social media playbooks

The organization's plan to align social media initiatives (e.g., the *when, where,* and *how* of social media use) with the organization's strategy.

Social media websites

Group of Web pages, usually containing hyperlinks to each other, made available by an individual or organization for the purpose of delivering information.

Social networking profiles

Description of an individual's social characteristics (e.g., interests, expertise, professional and personal affiliations, geographic location, communication patterns and networks) that identify her or him on social media sites such as LinkedIn and Facebook.

Social networking sites

Websites that allow people to create and manage content and connect with others. Some examples include Facebook, LinkedIn, Twitter, Instagram, and Pinterest.

Social recruiting

The act of recruiting candidates using social media platforms.

Society for Human Resource Management (SHRM)

The largest worldwide professional organization for HR practitioners and academics.

Software as a service (SaaS)

An approach to the delivery and use of HR software where the software is hosted remotely and accessed via a private or public (e.g., the Internet) network, and is often accessed using a Web browser. Instead of owning the hardware and software, it is rented by the organization. See also **cloud computing**.

Software testing

The process of validating the accuracy and correctness of software code before it is implemented.

Sourcing partner organizations

An external firm that partners with a company to provide some of its HR functionality, for example, recruitment or benefits management. Sourcing partners require certain information to complete these tasks, such as information about vacant positions, including position description, job specifications, desired candidate competencies, potential salary range, and contact information. The information provided is limited to specific searches for open jobs and is updated as needed.

Speeded tests

A type of selection that forces candidates to complete the test within an allotted time.

Spyware

Software installed on a computer that gathers information about a user's activities on the Web and transmits it to third parties.

Stakeholders

Those who have a direct interest or involvement in the implementation of an HRIS, or those that are affected by its implementation.

State of information

The state in which data are currently residing. It can be in storage (data at rest, waiting to be accessed), in process (being actively examined or modified), or in transmission (data in motion).

Stigmatize

To regard an individual negatively or with disapproval.

Strategic choices

The choices a firm makes about how to organize itself, what markets to participate in, what opportunities to purse based upon its unique capabilities.

Strategic human resource management (strategic HRM)

The strategic alignment of the HR management function with organizational goals. It aims to harness the potential of people as a key competitive advantage through the use of their creativity and innovation.

Strategic realignment

The realignment of HR practices so that they are in alignment with overall corporate strategic goals.

Sustainable competitive advantage

A way a firm achieves long-term competitive advantage in their market by having a resource that is valuable, rare, difficult to imitate, and does not have an easy substitute.

Synchronous communication

“Real-time” or live communication using tools such as messenger services or videoconferencing.

Syntactical level

When considering the interoperability of systems, it is the level at which different systems share the ability to interact and work with each other with respect to their programming languages.

System conversion

The process of migrating from an old HRIS to a new HRIS.

Systems development life cycle (SDLC)

A formal process through which a system is analyzed, redesigned, and implemented. The SDLC will include phases such as analysis/evaluation, design/improvement, development, implementation, and maintenance of the system.

Talent management (TM)

A strategic approach to the recruitment, selection, training, development, and management of employees, including the management of their performance and promotion, to meet the strategic objectives of a firm and, thus, improve the organization’s competitiveness in the marketplace.

Talent management life cycle

An integrated approach to managing talent that focuses on five key tasks: recruitment, selection, training, performance management, and succession planning.

Talent management system (TMS)

An integrated software suite that comprises a range of HR activities such as applicant tracking, succession and career planning, performance management, compensation and benefits management, and learning management.

Technical feasibility

A system feasibility assessment tool that focuses on the technical capability of the organization and the availability of the technology necessary to implement a new system.

Test security

Protecting the security of selection tests so that the questions and answers do not become available to those taking the test.

"Think global, act local"

The most common advice regarding the management of a multinational enterprise (MNE). This advice applies to the total management process of an MNE—its strategy, operations, finance, marketing, and HR—and has been followed religiously for many years in international management. Beaman has argued that this approach is completely the inverse of how we should be developing and managing our global HRIS projects.

Third-country nationals (TCNs)

Employees of the multinational enterprise who are citizens of a country other than the parent or host country.

Three-tier architecture

A computing architecture that distributes processing power across a machine that requests service (e.g., client) and two machines that provide data services (e.g., the database server) and application services (e.g., the application server).

Top-management support

Extent to which the executive managers of a firm (e.g., the C-suite) are willing to support and provide resources and authority necessary for project success.

Total HRO

An outsourcing approach that involves having all, or nearly all, HR functions handled by one or more external vendors. All traditional HR administrative and functional activities would be managed through third-party vendors.

Traditional HR activities

Activities that involve HR programs such as planning, recruiting, selection, training, compensation, and performance management.

Training needs analysis (TNA)

The training activity that identifies any discrepancies between existing knowledge, skills, and abilities and those required in the future (e.g., the "gap").

Training transfer

The transfer of competencies learned in training to the job.

Transaction cost theory

The idea that organizations can choose to purchase the goods and services they need in the competitive marketplace or make those goods and services internally.

Transaction processing systems (TPS)

Software applications that process operational data and whose main functions are (1) data storage, processing, and flows at the daily operational level and (2) efficiency, accuracy, and speed.

Transactional HR activities

Routine, day-to-day activities of the HR department, such as record keeping, that are important but add little value to the competitive position of the organization.

Transformational HR activities

Those activities that add value to the organization—for example, cultural or organizational change, structural realignment, strategic redirection, and increasing innovation.

Transition

The phase in Lewin's change model where the change happens; also called *changing.*

Transnational corporation

A type of multinational corporation that tailors business operations and HR management to the local culture.

Trojan

A type of malware that hides inside e-mail attachments or files and infects a user's computer when it is opened and/or executed. Trojans are named after the Trojan horse of Greek mythology in that they appear to be something positive, but are in reality doing something malicious.

Troubled Asset Relief Program (TARP)

A U.S. government program that purchased financial assets of troubled companies with the goal of stabilizing the U.S. economy.

Two-tier (client server) architecture

The software and hardware configuration that divides a business application into two tiers, typically with the user interface and some business logic on the user's computer, such as a PC (the client), and the database and mainstream parts of the application stored on a server.

Unauthorized access

To access employee (or other types) of data without permission or authority.

Unauthorized disclosure

The disclosure of employee information to third parties without the permission of the employee.

Unfreezing

The first step in Lewin's change model where the organization creates an awareness of the need for change and a desire to change in employees.

Unproctored testing

A form of selection testing where the job candidate is tested online at a location and time convenient to them and there is no proctoring of the exam by a test administrator.

U.S. Fair Labor Standards Act of 1938

A federal U.S. law that established the 40-hour work week, but it also required employers to maintain records of basic employee information.

Usability (of a website)

The extent to which users are able to use a website effectively. Web usability is often viewed as being comprised of a number of dimensions, including navigability, content and display of information, aesthetics, and ease of use.

User acceptance

The willingness of a user of a system to employ the new technology.

User documentation

A description of how to interact with the HRIS. It should cover a variety of tasks such as data entry, using the system, and basic troubleshooting.

User interface

The communication boundary between the hardware device (e.g., computer, PDA, kiosk) and the user of that hardware. It is the point at which the user interacts with the system, providing inputs and receiving information or feedback from the system.

Utility formula

The value that a selection test provides for an organization; assessed as a formula that takes into account factors such as the validity of the test, the selection rate, and any change in performance that can be attributed to the test.

Validity coefficient

A statistical correlation that indicates the correspondence between test scores and job performance or some other important work outcomes.

Variety

The different forms of data collected by the organization and stored in the data warehouse.

Velocity

The speed at which an organization captures data and stores it in the data warehouse.

Veracity

Quality of the data collected by the organization and included in a data warehouse.

Virtual workspace

A work environment where the employees of a company work away from company premises and communicate with their respective workplaces via telephone or computer devices.

Volume

In data warehousing, it refers to the amount of data that organizations collect and include in a data warehouse.

Web 1.0

The first generation of the Web, where static web-pages are connected via hyperlinks.

Web 2.0

The second generation of the Web that utilizes dynamic user-generated content, creativity, collaboration, and information sharing.

Web 3.0

An evolution of Web 2.0 that is based on a number of developments such as the semantic Web, open and mobile access, augmented reality, and intelligent applications.

Work breakdown structure

A definition of the order in which activities, tasks, and jobs are to be performed that also establishes specific check or monitoring points.

Work simulation

An in-basket exercise in which the examinee must examine a variety of types of information (correspondence, reports, and other information) and also interact with simulated coworkers, employees, or other business associates (whether computer simulated or role-played by actors over the telephone or in person). The examinee is evaluated on a variety of dimensions, from accuracy and the quality of decisions to work-related competencies, interpersonal skills, and other personal attributes.

Workforce analytics

Strategies for combining data elements into metrics and for examining relationships or changes in HR metrics.

Workforce modeling

A technique that attempts to understand how an organization's human capital needs would change as a function of some expected change in the organization's environment. This change may be a shift in the demand for the organization's product, entry into a new market, divestiture of one of the organization's businesses, or a pending acquisition of or merger with another organization.

Workforce Planning Systems (WPSs)

HR software that helps organizations manage workforce planning.

Worms

A stand-alone software program that is meant to disrupt computer and network operations that can replicate itself to spread. Unlike viruses that require the spreading of an infected file, worms can spread by themselves without attaching to files.

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