Chapter 2
HR Technology

Chapter Learning Objectives

Questions this chapter will help managers answer are as follows:

1. How is technology changing work and organizations?
2. How does HR technology affect the management of people?
3. How can managers leverage HR technology to maximize efficiency and effectiveness?
4. What key considerations should guide the selection of a vendor for an organization's human resource information system?
5. What challenges will managers confront when implementing HR technology?

Key Terms

Ubiquitous computing
Decision-support systems (DDS)
Technology
Assistive technology
Gamification
Biometrics
Electronic (e-) learning
Micro-learning apps
Collaborative media platforms
Applicant-tracking systems
Self-service portals
E-verify
HR risk
Multifactor authentication
Relational databases
On-premise systems
Software-as-a-service (SAAS) systems
Best of breed
HR dashboard
Descriptive analytics
Predictive analytics
Prescriptive analytics
Usability

How Technology Is Changing Work and Organizations

- People live in a global world where technology, especially information and communication technology, is changing the manner in which businesses create and capture value, how and where they work, and how they interact and communicate.
- Consider five technologies that are transforming the very foundations of global business and the organizations that drive it:
    - Cloud and mobile computing
    - Big data and machine learning
    - Sensors and intelligent manufacturing
    - Advanced robotics and drones
    - Clean-energy technologies
- These technologies are not just helping people to do things better and faster, but they are enabling profound changes in the ways that work is done in organizations.
- The last great wave of technological innovation was all about social interaction.
- The next one may well feature the emerging general technology paradigm known as **ubiquitous computing.**
    - This concept is not about one technology.
    - Rather, it reflects information and communication environments in which computer sensors (such as radio frequency identification tags, wearable technology, smart watches) and other equipment (tablets, mobile devices) are unified with various objects, people, information, and computers as well as the physical environment.
        - The combination of these developments is giving us a new kind of world, "one that is hyperconnected and data saturated, a world where an Internet of everyone is linked to an Internet of everything" (Wooldridge 2015, p. 29).
- These new technologies, disruptive as they are, did not just appear overnight.
    - Rather, many other developments in technology preceded them, and their effects on work and organizations over the past several decades have been profound.
- Consider just a few, brief examples to illustrate how applications of ubiquitous computing may disrupt work and work systems in organizations:
    - As employees wear clothing and other wearables embedded with computer chips and sensors, they no longer need to carry a computer separately to meetings.
        - They are armed with up-to-date information, their decisions are guided by analysis of the information provided by cloud computing, and they can resolve operational issues in creative ways that were not possible before.
    - Computer networks allow employees to work from the office, their home, or anywhere.
        - Employees are routinely collaborating with people they have never met, in places they have never visited, and are staying connected with the office

anywhere and anytime.
        - This has enabled the emergence of ubiquitous working environments supporting different types of working styles and conditions.
    - Computer programs, intelligent robots, and other devices are used to perform an increasing variety of tasks with a high level of technical skills, and with benefits that include lower costs, higher quality, improved safety, and environmental protection.
        - People, however, participate in defining, creating, and maintaining these automated programs, machines, and other devices.
    - Employees can integrate their use of Facebook, Twitter, Google, and other social media into their daily routines, and companies can integrate social media into their intranets, so that they can share internal information and knowledge with employees, and even with suppliers and customers if desired.
    - Through the use of smartphones, GPS, earphones, and microphones, employees can access online education and training materials anytime from their own companies, but also from universities in or outside their home countries.
- To some, ubiquitous computing is a threat because of its impact on jobs.
    - It is by no means the first technology to have such effects.
- From steam engines to robotic welders and ATMs, technology has long displaced humans—often creating new and higher-skill jobs in its wake.
    - The invention of the automobile threw blacksmiths out of work but created far more jobs building and selling cars.
- Over the past 30 years, the digital revolution has displaced many of the middle-skill jobs that underpinned 20th-century middle-class life.
    - The number of typists, travel agencies, bank tellers, and production-line jobs has fallen dramatically, but there are ever more computer programmers and Web designers.

Challenge Questions

1. How can managers maximize the positive effects of technology at work?

   Students' answers will vary. People live in a global world where technology, especially information and communication technology, is changing the manner in which businesses create and capture value, how and where they work, and how they interact and communicate. Five technologies that are transforming the very foundations of global business and the organizations that drive it are as follows:
   - Cloud and mobile computing
   - Big data and machine learning
   - Sensors and intelligent manufacturing
   - Advanced robotics and drones

- Clean-energy technologies

These technologies are not just helping people to do things better and faster, but they are enabling profound changes in the ways that work is done in organizations. However, if technology is to enable people at work, it should foster self-motivation and well-being, key elements of self-determination theory; enhance productivity; and promote job satisfaction, organizational commitment, and citizenship behaviors among workers.

2. What advice would you offer a young person about the effects of technology on his or her career?

Students' answers will vary. Even if today's information and communication technologies are holding down employment, history suggests it is a temporary, although painful, shock. As workers adjust their skills and entrepreneurs create opportunities based on the new technologies, the number of jobs will rebound. At the same time, people believe that human ingenuity will create new jobs, industries, and ways to make a living, just as it has been doing since the Industrial Revolution.

3. How has ubiquitous computing changed the way you live and work?

Students' answers will vary. Ubiquitous computing reflects information and communication environments in which computer sensors (such as radio frequency identification tags, wearable technology, and smart watches) and other equipment (tablets, mobile devices) are unified with various objects, people, information, and computers as well as the physical environment. Consider just a few, brief examples to illustrate how applications of ubiquitous computing may disrupt work and work systems in organizations:

- As employees wear clothing and other wearables embedded with computer chips and sensors, they no longer need to carry a computer separately to meetings. They are armed with information that is up to date, their decisions are guided by analysis of the information provided by cloud computing, and they can resolve operational issues in creative ways that were not possible before.
- Computer networks allow employees to work from the office, their home, or anywhere. Employees are routinely collaborating with people they have never met, in places they have never visited, and are staying connected with the office anywhere and anytime. This has enabled the emergence of ubiquitous working environments supporting different types of working styles and conditions.
- Computer programs, intelligent robots, and other devices are used to perform an increasing variety of tasks with a high level of technical skills, and with benefits that include lower costs, higher quality, improved safety, and environmental protection. People, however, participate in defining, creating, and maintaining these automated

programs, machines, and other devices.

- Employees can integrate their use of Facebook, Twitter, Google, and other social media into their daily routines, and companies can integrate social media into their intranets, so that they can share internal information and knowledge with employees, and even with suppliers and customers if needed.
- Through the use of smartphones, Global Positioning System (GPS), earphones, and microphones, employees can access online education and training materials anytime either from their company location or from universities in or outside their home countries.

Chapter 2 Outline

I. Technology and Its Impact on HR Management

- By any standard, technology is changing the ways people live and work.
  - According to the Oxford English Dictionary, the term *technology* refers to the application of scientific knowledge for practical purposes, especially in industry—for example, "advances in computer technology."
- Technology affects nine key areas of HR management:
  - Business leadership
  - Compensation and benefits
  - Diversity
  - Employee relations
  - Labor relations
  - Organization and employee development
  - Safety and security
  - Recruitment and staffing
  - HR risk management

A. Business Leadership

- Technology is an ever-present focus for leaders because it is constantly evolving, and because it affects the ability of their organizations to be competitive, to stay ahead of the curve.
  - Indeed, some organizations use technology to disrupt the status quo of their industries.
- Some technology requirements involve basic business functions, such as word processing, planning, accounting, budgeting, legal compliance, research, and communications.
  - Yet a vast and ever-increasing array of software, Web-based, and mobile

applications has also affected higher-level functions and helps organizations achieve their strategic objectives.

- Predictive talent analytics help organizations move from simply describing what is to predicting important outcomes, such as the number of employees expected to quit at various levels in the coming year or over the longer term.

B. Compensation and Benefits

- Many employers use technology in benefits administration.
- **Decision-support systems (DSS)** help employees make the best choices from among an array of benefits, given their individual situations (e.g., married, single, with dependents, no dependents).
- Self-service Web sites enable employees to go online to make changes to their benefits or to record change-in-life events, such as marital status or the birth of a child.
    - When employees opt in, automated systems facilitate retirement contributions by making regular deductions from a worker's pay and directing each person's contributions according to his or her wishes.
- HR technology is widely used in administering pay systems.
    - State-of-the-art systems link time and attendance records to payroll systems, and those systems operate with little to no human intervention.
    - To eliminate paper checks entirely, many payroll systems pay workers electronically.
- In addition, HR technology allows organizations to operate multiple incentive systems across business units, and it facilitates seamless pay-for-performance programs by integrating compensation plans with performance management tools.

C. Diversity

- People with physical disabilities play important roles in increasing diversity in organizations, and advances in **assistive technology** have dramatically increased job opportunities for them.
    - Organizations benefit because they are able to recruit from a broader pool of applicants.
- Importantly, the costs of many assistive tools have dropped dramatically over the past decade, making them affordable for companies of all sizes.
- Here are just a few examples of such tools for visually or hearing-impaired individuals:
    - For those with visual impairments, screen readers like JAWS or Window-Eyes read the content of computer screens to users and provide speech and Braille output for many popular computer applications.
        - Screen-magnification programs like ZoomText or Magic enlarge text or

images for easier viewing.
        - Another new tool is OrCam, a small camera mounted on glasses that converts visual information—such as that from newspapers, computer screens, restaurant menus, or street signs—into the spoken word, relaying information to users through built-in mini speakers.
    - For those who are deaf or who have hearing impairments, programs like Ava can be used on smartphones or tablets.
        - Ava transcribes what is being spoken in one-to-one or group conversations.
        - Microphones on mobile devices pick up voices, and the Ava software converts words into text, presented on the user's phone or tablet display.
        - To respond, a deaf or hearing-impaired person uses a keyboard supplied with Ava to type what he or she wants to say, and it is then projected through speakers on the phone.

D. Employee Relations

- The move to a technology-driven, mobile workforce where employees are accessible at all times via mobile phone and e-mail is a double-edged sword.
    - On the one hand, it allows employees to work flexible hours or remotely.
    - On the other hand, it can promote overwork and burnout.
    - The challenge for managers is to promote a culture that balances on that fine line.
- Social media present a special challenge for HR.
    - Although business-related social-networking sites are great sources for talent sourcing, networking, and advertising, there is also a need for organizations to devise social-media policies that will protect their brands from slander or libel from employees or competitors.
- HR technology is extremely helpful in conducting employee surveys via a company's intranet or the Internet, and integrated talent management systems can tie performance management to compensation as well as to learning and development.
    - The result is a holistic system with the capability to train, track, and reward performance.
- In the area of learning and development, technology-delivered instruction—the presentation of text, graphics, video, audio, or animation in digitized form—is catching on fast.
    - One example of this is **gamification.**
        - Gaming technology is being used to engage employees and direct behavior through interactive games and competitions.
    - A final application of technology in employee relations is **biometrics**—unique physical and behavioral features (such as fingerprints or eye pupils) that can be sensed by devices and interpreted by computers to bond digital data to personal

identities.

- Biometrics can increase efficiency, prevent fraud, and ensure the safety of workers.
- At the same time, however, organizations using them must balance employee privacy and security.

E. Labor Relations

- In the context of collective bargaining, software has long been used to address "what if?" questions and to cost out various proposals, such as those involving wage increases, along with contributions to benefit options such as paid leave, health and other types of insurance, pensions, and various retirement-savings vehicles.
- At the same time, technology in the form of e-mail, social media, and various Web sites, has changed union strategies for organizing and communicating with members and nonmembers.
  - It is important to note, however, that employees may not use their employer's e-mail system for those purposes.
  - The National Labor Relations Board has held that employees have no legally protected right to use an employer's e-mail system for organizing or other legally protected, concerted activity.

F. Organization and Employee Development

- Three areas in particular have benefited from HR technology:
  - Workforce planning
  - E-learning
  - Tools to promote collaboration
- Talent analytics is playing an ever more significant role in workforce planning, for example, by identifying talent gaps in workforce forecasts, high-potential employee segments that are at risk of leaving, and the potential redeployment of surplus employees in existing talent segments.
- Technology-based **electronic (e-) learning** can often generate savings in time and cost over traditional, classroom-based learning.
  - The percentage of training resources devoted to e-learning is clearly increasing, with 64 percent of organizations now using virtual classrooms.
- One type of e-learning is short digital learning sessions that are available at employees' convenience and delivered through **micro-learning apps.**
- E-learning companies such as Grovo; Udemy, Inc.; and Lynda.com (now owned by LinkedIn) offer micro-learning formats for corporate-skills training (e.g., how to use a piece of accounting software, how to manage conflict). Duolingo offers them for

language skills.
    - Typically, they comprise a mix of video and interactive lessons that take fewer than five minutes to complete, and they include a quiz.
    - Users can access micro-learning apps either online or via their smartphones.
- Evidence indicates that e-learning does work, but its effectiveness depends on the delivery method as well as the skill or task being trained.
- With respect to collaborative tools, there are two broad groups:
    - Web-based tools
    - Collaborative media platforms
- Web-based tools include blogs, wikis, and social networking sites where people mine and exchange information.
    - These tools have been adapted for secure use by businesses, and vendors have infused many of these features into their software.
- **Collaborative media platforms** are specialized tools for various disciplines, from sales to supply-chain management.
    - They also support various HR processes—for example, recruitment and performance management (360-degree feedback that incorporates ratings from superiors, peers, and subordinates).
    - Other tools in this category include file-sharing sites and other spaces where teams can collaborate on projects to share information in a private, secure setting.

G. Safety and Security

- The most common use of HR technology is a human resource information system (HRIS).
- HRIS allows organizations to sort information so that it can be used for record keeping, reporting, and business decision making.
- HRIS also facilitate the documentation and management of training activities, many of which are required in safety-sensitive or other positions.
- Beyond that, they facilitate electronic communications, digital access to key login information, data management from security cameras, and, by incorporating proper safeguards, employee protection from identity theft.

H. Recruitment and Staffing

- A vast and ever-increasing array of technology is available to assist organizations with recruitment and staffing management:
    - Applicant-tracking software
    - Web-based applications
    - Cloud computing

    - Mobile apps
    - Video products
- Organizations compete in talent markets, domestic and global, and technology often helps them attract and hire the best talent from those markets.
    - Indeed, organizations that do not have some type of online-application process are at a competitive disadvantage, because most job seekers now apply online.
- At a general level, HR technology is used widely to source talent, to track applicants through the various steps of the recruitment-selection process, and to facilitate background investigations, job analyses, and applicant screening.
- Social media like LinkedIn and Web-based search engines enable firms to identify candidates.
    - Savvy recruiters are constantly looking for ways to poach high performers, and HR technology makes it easier than ever to find them.
- In recruiting, the most robust **applicant-tracking systems** record and analyze data to meet EEO and government-contractor requirements.
    - They track where each applicant is in the recruitment process, and they generate reports that analyze the relative performance of alternative recruitment sources and strategies.
- To market their job openings more strategically, some employers are using real simple syndication (RSS) to reach job seekers via e-mail or text message as soon as a new job is posted.
- Finally, **self-service portals** allow applicants to manage multiple applications at once as their multimedia résumés display text, photos, videos, and sound.
    - Sites like Glassdoor.com and TheJobCrowd.com allow job seekers to research an employer's brand and decide if they even want to apply for a job there.
        - Those sites provide information about the cultures and values of an organization and its senior managers, interview questions, and salaries.
- When it comes to applicant screening, thousands of employers use **e-Verify**, a free Web-based tool from the Social Security Administration and the Department of Homeland Security to verify a match between employees' names, Social Security numbers, and immigration information.
    - Desktop job-search engines like Google allow employers to conduct background checks, supplemented by third-party background screeners using Internet-based tools and databases.
    - Private blogs and postings on social-networking sites like Facebook, LinkedIn, and Twitter provide additional information to consider.
    - Aptitude tests administered online, such as for computer programming, basic math, and verbal comprehension, make applicant screening more efficient.
    - Finally, electronic on-boarding systems handle tasks like assigning parking passes, computers, uniforms, e-mail addresses, and security badges.

- Some employers with globally distributed workforces, like IBM, use technology-delivered learning to teach new employees about corporate culture and business processes.
    - Avatars of new employees attend meetings, view presentations, and interact with other avatars in a virtual IBM community.

I. HR Risk Management

- **HR risk** refers to the uncertainty arising from changes in a wide range of workforce and people-management issues that affect a company's ability to meet its strategic and operating objectives.
- Such risks typically fall into four main categories:
    - Strategic risks
    - Compliance risks
    - Operational risks
    - Financial risks
- With respect to HR technology, the primary concern is operational risks that might impede a firm's ability to meet its operating and strategic objectives.
- Two key subareas include policies and procedures that define internal controls and vendor management and sourcing.
- In the digital age, a major area of internal controls is the responsibility to ensure that employees' personal information is protected.
    - Risks run the gamut from the release of sensitive data to the wrong manager to major security breaches or hacks that expose employees' personal information to external, unknown sources.
- Sensible policies and security protocols can minimize the risk of security breaches.
- Here are three examples:
    - **Multifactor authentication** (requiring not only a password and user name but also something that only a user has, such as a code sent to his or her smartphone in order to log in to a Web site)
    - Encrypting sensitive data
    - Restricting the type of data that can be shared in the cloud or on social media
- Finally, organizations should be vigilant with vendors that require personal data.
    - Some organizations require all vendors to meet or exceed specified levels of IT security protocols as a condition of doing business with them.
    - It's also important to understand what steps a vendor will take in the event of a breach.

II. Leveraging HR Technology—Human Resource Information Systems (HRIS)

- A key feature of all modern HRIS systems is the use of **relational databases** that store data in separate files that can be linked by common elements, such as name, Social Security number, hiring status (full- or part-time), training courses completed, job location, mailing address, or birthdate, among others.
    - A relational database lets a user sort the data by any of the fields.
- HRIS have come a long way.
- Early applications were built for computer-system specialists.
    - Managers, employees, and even HR professionals were far removed from the process.
    - High costs convinced small companies to stick with their filing cabinets, Rolodexes, or Excel spreadsheets.
- Today's more affordable systems allow managers to make informed decisions, often based on predictive analytics, about a wide range of issues in talent management.
    - HRIS can be as simple as a small, internally developed employee database or as complex as a fully integrated enterprise resource planning (ERP) system offering economies of scale to larger companies.
- Both large and small companies are eager to take advantage of the new technology.
    - Large employers want to upgrade their aging **on-premise systems** (platforms housed in privately controlled data centers) to cloud-based **software-as-a-service (SAAS) systems:** subscription-based software paid on a month-to-month basis.
    - Small employers want to upgrade after years of using spreadsheets.
- Buyers in both groups need to be savvy consumers in order to choose wisely from the wide array of HRIS platforms that are available.
- Items to consider when choosing an HRIS are as follows:
    - What do you want the system to do
    - Make the business case
    - Compare vendors
    - Match technology to organizational needs
    - Don't overlook finance or information technology (IT)
    - Assess end users' experiences
    - Implementation issues

A. What Do You Want the System to Do?

- An HRIS should last 5–7 years.
    - To do that, it's important to identify today's needs as well as tomorrow's.
- The first step is to develop a deep understanding of top management's long-term goals and objectives in order to create buying criteria for a long-term solution.
    - An organization poised for aggressive growth will have different needs than one that is shedding assets and reducing its operations.

    - Perhaps the biggest regret among dissatisfied buyers is that they focus only on automating transactional activities, such as payroll processing or legal/regulatory and compliance activities, focusing on the short term.
- Begin by identifying immediate problems to solve as well as longer-term challenges.
    - Immediate problems might include reducing human error in data management, reducing cycle time in recruitment, or remaining compliant with regulatory or legal requirements.
    - Longer-term challenges might be to create a positive employer brand by enhancing each applicant's experience, gaining a first-mover advantage in recruiting, or improving new-hire on-boarding experiences.
- Know what features the HRIS needs to have, as well as those that might be nice to have, over short- and longer-term horizons.
- Beyond that, what kind of a budget do you have to work with?
    - Who will have access to the HRIS?
    - What security controls do you need?
    - Will the HRIS need to be compatible with other systems (e.g., accounting)?

B. Make the Business Case

- In addition to the needs of HR, the business case for an HRIS will be stronger if one can address the concerns of senior managers and show how the software will affect other departments.
    - In short, try to anticipate issues that will affect key players.
- A strong business case will closely align HR goals with an organization's business strategy (e.g., reducing the time it takes to hire and make a new employee fully productive) and will specify the anticipated impact of the new system on the organization's bottom line.
    - To do that, HR must quantify the current level of services as well as future and anticipated benefits in financial terms.
- Decision makers want to see financial returns over multiple time periods.
    - Emphasize how the new system will reduce administrative and processing costs, increase efficiencies, and generate value-added knowledge from data analytics, while supporting an organization's principal business needs.

C. Compare Vendors

- Consider three broad strategies for adopting HR technology:
    - An integrated system from a single vendor
    - **Best of breed** (select the best applications in each area from multiple vendors)
    - Outsource HR technology infrastructure to a third-party vendor

- There is no single best system, as organizations vary in their needs, resources, and priorities.
- When comparing vendor systems, start by identifying a small number of main uses of the HRIS—say, three or four—and ask each vendor to demonstrate how it addresses each one.
- How much support for each of these uses can you expect from each vendor?
    - Smaller organizations with limited internal staff and resources to draw on need strong implementation and customer support from the vendor of choice.
- Here are two other recommendations:
    - People demonstrating the software know how to hide usability issues.
        - Test each system yourself before you spend money and roll out the software companywide.
    - Beware of a vendor that is unwilling to say, "Our system doesn't do that."
        - If the answer to every question is yes, then something is probably wrong.

D. Match Technology to Organizational Needs

- There is enormous variation across vendors in terms of the capabilities their HRIS offer.
    - This is why it is absolutely essential to specify in advance what you want an HRIS to do.
- Knowing "need-to-have" HRIS features in advance helps protect an organization from paying for nonessential, but perhaps "nice-to-have," features.
    - Do you want an **HR dashboard,** for example, that displays a series of measures that indicate HR goals and objectives (e.g., for diversity or employee development) and the progress toward meeting them?
- At the high end, Heineken and Lufthansa, for example, chose SAP's Success Factors, an SAAS system, that offers capabilities such as 2,000 built-in metrics, analytics capabilities to correlate workforce data with financial and other non-HR data to generate actionable insights, and built-in "wizards" to reduce errors in employee self-service functions.
- More modestly priced HRIS, such as Halogen's, are targeted to midsized organizations.
    - Its pay programs manage variable pay; it offers an automated performance management system that incorporates appraisals, goal setting, and employee check-ins; and the overall platform allows managers to view comprehensive data about each employee.
- Small organizations, in contrast, might choose an HRIS from Bamboo that allows them to transition from spreadsheets to an affordable HRIS.
    - Employee information can be consolidated from multiple locations into a single view, and global settings support six languages and all popular currencies to track payroll.

    - In addition, HR data can be exported into standard or custom reports.
- These are examples of just three of dozens of vendors.
    - Can one appreciate why it is so important in advance to have a well-defined "shopping list" of features one is willing to pay for?

E. Don't Overlook Finance or Information Technology (IT)

- When choosing an HRIS, a big mistake for any organization, large or small, is to fail to include representatives from finance and IT in the vendor-selection process.
    - It is too late to bring them in *after* a system is purchased.
- Indeed, IT should provide critical information about the types of features and platforms it is able to support, including software setup and maintenance, as well as requirements for data security.
- Finance needs to endorse the business case for an HRIS, particularly the expected payoffs for the organization.
- Beyond that, a basic concern for finance is for an integrated payroll module or for an HRIS that will work smoothly with the payroll system that is already in place.

F. Assess End Users' Experiences

- When comparing alternative HRIS, it is critical to assess the experiences of end users.
    - This is one reason a demonstration-only from different vendors is not enough.
- Various types of users need to experience the HRIS features for themselves.
    - If employees or managers will use the system, there are high expectations for a user-friendly, consumer-grade technology experience.
- Managers may use the system to modify or approve time sheets or performance reviews.
    - Inputs from all three groups can provide valuable information when choosing an HRIS that best fits an organization's needs.

G. Implementation Issues

- Successful implementation is critical, and the first step is to be crystal clear about the underlying objectives for the new HRIS.
- To accomplish work in the digital age, the majority of new HRIS are in the cloud, and the top four reasons for replacing an HRIS are as follows:
    - To have a single system of record for HR data
    - To ensure reliable, consistent reporting for compliance and legal obligations
    - To standardize HR data across multiple geographies or business units
    - To move away from legacy systems that were not meeting organizational needs
- These become important criteria for assessing the effectiveness of the new HRIS.

- A detailed treatment of system integration is beyond the scope of this chapter, but a key issue for the integration team is to verify the accuracy and integrity of the data in the new system.
    - Are the data stored in the correct location?
    - Can users query the data?
    - Are data available to individuals with appropriate security clearances?
- Members of the software team and the functional HR team should test each module to ensure that it works as intended, and that it produces accurate data.
- Upgrading or purchasing a new HRIS is a multifaceted undertaking, and there are many potential roadblocks that can hinder success.
- Following the seven steps outlined above can help ensure that this HR technology will perform successfully for years to come.

III. Challenges Facing HR Technology

- Five emerging challenges in HR technology are as follows:
    - New skills and roles for HR staff
    - Increasing expectations and demand for data
    - More distant HR staff
    - Need to improve the quality of decisions
    - Increasing the comfort level of *all* employees with HR technology

A. New Skills and Roles for HR Staff

- In small organizations, HR generalists will be responsible for managing the HRIS as well as the growth in services that it supports.
    - They will need to have technical skills as well as interpersonal skills, for they will have to develop relationships with vendors.
- In larger organizations, HR staff will focus on policy decisions, complex or sensitive employee issues, and analysis of people-related business issues that have financial implications for the firm.
    - HR professionals may become HRIS content experts or generalists who focus on organizational effectiveness and one-on-one coaching experts with managers.
    - HRIS content experts or generalists who focus on organizational effectiveness and one-on-one coaching experts with managers.
- Both skill and educational levels will rise for HR professionals as their roles change in the digital age.

B. Increasing Expectations and Demand for Data

- As consumers who use smartphones, smart televisions, or consumer electronics, people have come to expect intuitive, easy-to-use software.
- As employees, they want the same high-quality experiences when they use employee self-service features of an HRIS.
- When they can manage more personal data and use the HRIS to answer questions and make decisions, they will begin to ask new questions and seek broader information.

C. More Distant HR Staff

- As more HR content becomes available online, and as employee self-service becomes the norm rather than the exception, there is naturally less contact between employees and HR professionals.
- Particularly in organizations with newly adopted HRIS, employees may miss the personal contact they previously enjoyed with HR staff.
    - Working with a computer to complete tasks they used to accomplish collaboratively in person may seem a little awkward at first.
    - Communications and relationships with HR staff may become more distant.
    - To deal with this, HR staff should be highly visible and accessible in the workplace, so that they can interact with employees as needed.

D. Need to Improve the Quality of Decisions

- HR technology can dramatically improve the time and cost per transaction as HR staff, employees, and line managers gain access to increased data to support decisions.
- An unanticipated consequence, however, is that the logic behind the decision may become less transparent.
- As a result, the overall quality of a decision may not improve.
    - To avoid this situation, ensure that all employees and managers understand the processes and policies that are embedded in the self-service features of the HRIS.

E. Increasing the Comfort Level of *All* Employees with HR Technology

- Many of today's employees are "digital natives" who have grown up with technology as a central feature of their lives.
    - This not true for everyone, though, particularly those from lower socioeconomic backgrounds who may have less experience using computers and may have limited access to computers in their communities.
- To include as many applicants as possible in the recruitment process, for example, be sure to encourage applications from a variety of channels—mobile phones, online, in-person, or by mail.

- In on-boarding new hires, take the time to ensure that each individual is comfortable and competent when using the company's intranet and HRIS.
- Employees will appreciate the attention, and the payoff in improved productivity will be immediate.

IV. HR Technology Trends

- Five emerging trends in HR technology are as follows:
  - Expansion of social networking
  - Growth of compliance and reporting requirements
  - More renting, less buying of services
  - Growth in the use of data analytics and dashboards
  - More transparent HR policies, increasing concerns about data privacy

A. Expansion of Social Networking

- As the popularity of social-networking sites grows, more and more organizations are integrating information from them.
  - This is a trend that is too big for many organizations to ignore.
- As an example, consider LinkedIn.
- LinkedIn operates the world's largest professional network on the Internet, with more than 467 million members in more than 200 countries and territories.
- For a fee, organizations can sign up for a LinkedIn "Recruiter" account that allows access to the entire LinkedIn network.
  - Designed specifically to match an organization's staffing workflow, Recruiter's user interface includes more than 20 advanced search filters.
  - Alternatively, an organization can create a search based on its ideal candidate. It can contact potential candidates using "InMail" and incorporate collaboration and productivity features as well as administrative functions to manage accounts.
- On the supply side, potential applicants can receive e-mail alerts for new jobs posted on LinkedIn that match advanced search criteria that they specify, or postings that are recommended to them from a feature called "Jobs You May Be Interested In."

B. Growth of Compliance and Reporting Requirements

- In country after country, organizations continue to be affected by national and local compliance requirements, legal and regulatory, which require HR to collect and report additional information.
- Firms increasingly will need to adapt their HRIS in order to remain compliant.
- Pending changes in tax codes, financial regulations, equal employment opportunity

compliance, and health care, just to note a few areas, all suggest that compliance and reporting demands will increase.

C. More Renting, Less Buying of Services

- According to Mercer Consulting's 2016 Global Human Resources Information Services study, the majority of new HRIS implementations are in the cloud.
- In such a software-as-a-service (SaaS) approach, an organization rents services and software from a vendor.
    - Rather than store data on company servers, they are stored on the software's servers off-site and accessed via the Internet.
- Advantages include vendor responsibility for maintaining and updating the software, access from any device with a Web browser and any location with Internet service, cost based on employee headcount, and data managed on remote servers.
    - If disaster strikes an organization (e.g., a fire, a tornado, an earthquake) HRIS data are not lost.
- On the other hand, one of the disadvantages to using an SaaS approach is that the software is not customizable to the specific needs of an organization.
    - Firms either find a solution that best matches their needs or change their processes to fit a particular system.
    - For organizations with existing systems, full integration of old and new systems can be challenging.
    - Finally, access to the software can be disrupted due to a faulty Internet connection, vendor maintenance, or if a vendor goes out of business.
- Weigh the pros and cons carefully before making a final decision.

D. Growth in the Use of Data Analytics and Dashboards

- In a 2016 report, Deloitte stated: "The use of analytics in HR is growing, with organizations aggressively building people-analytics teams, buying analytics offerings, and developing analytics solutions.
    - HR now has the chance to demonstrate return-on-investment on its analytics efforts, helping to make the case for further investment."
- Despite that rosy picture, three key challenges remain:
    - Turning analytical insights into business actions
    - Aggregating multiple data sources
    - Lack of appropriate analytical skills
- HRIS are particularly well suited to address challenge #2, whereas the other two depend on acquiring and retaining the right talent.
- Organizations will move from using **descriptive analytics** to understand what happened

in the past and why to **predictive analytics** to model what will happen, and ultimately to **prescriptive analytics** to develop multiple scenarios about the future.
    - This will enable managers to use HR data to make better decisions about the workforce.
- At the same time, HR dashboards, which provide high-level, real-time, graphically formatted data to managers, will become integral features of talent management.

E. More Transparent HR Policies, Increasing Concerns about Data Privacy

- As noted by Johnson and Geutal, "HRIS can make more HR data—including policies and procedures—more accessible and transparent to employees."
    - Web-based capabilities will increase this transparency, as employees enjoy even greater access to their own data, as well as to HR data traditionally available only to HR staff.
- At the same time, concerns about privacy will increase.
    - Few organizations manage as much personal information as do employers.
- As employers make data easier to access, the risk of jeopardizing employees' privacy increases.
    - Managing this risk has become more complex as HR applications often link to systems outside the organization, such as benefits vendors, online job-search sites, and distance-learning providers."
- HR technology—most prominently in the form of HRIS—have changed the ways that HR services are delivered and managed.
- Self-service portals promise faster execution of employee and manager transactions, with more informed users.
- At the same time, however, there is an urgent need to protect the integrity and privacy of employees' data and to ensure that all users are comfortable with the system.
- HR functions that can achieve those objectives will add genuine value to their organizations.

How Technology Is Changing Work and Organizations

- Even if today's information and communication technologies are holding down employment, history suggests it is a temporary, although painful, shock.
    - As workers adjust their skills and entrepreneurs create opportunities based on the new technologies, the number of jobs will rebound.
    - At the same time, people believe that human ingenuity will create new jobs, industries, and ways to make a living, just as it has been doing since the Industrial Revolution.
- What about the demand for managers and executives?

  - Unlike effective managers, machines have not yet learned to tolerate high levels of ambiguity or to inspire people at every level in organizations.
  - Success depends on the ability of executives to tolerate ambiguity and to synthesize and integrate a variety of types and forms of information.
  - The big picture represents the glue that holds a company together.
- When it comes to engaging and inspiring people to move in the same direction, empathizing with customers, and developing talent, humans will continue to enjoy a strong comparative advantage over machines.
  - No computer will ever manage by walking around, but inspirational leadership will always be in demand.
- With respect to the adoption and implementation of technology, it can be used to enable or to oppress people at work.
- Self-determination theory is a particularly useful guide.
  - That theory holds that self-motivation and well-being will be enhanced when innate needs for autonomy, competence, and relatedness are satisfied, and they will be diminished when these needs are thwarted.
    - Autonomy is the need to control one's actions, to be a causal agent in one's life.
    - Competence is the need to experience mastery and to affect one's outcomes and surroundings.
    - Relatedness is the need to feel interpersonally connected with others.
- In practice, at least four considerations influence the adoption and implementation of workplace technologies.
  - First, are they natural and easy to use?
    - **Usability** concerns the interface between humans and technology, and it can be measured in terms of efficiency (time to complete a task), effectiveness (error rate), and user satisfaction.
  - A second consideration is self-efficacy.
    - People who feel competent to use, or to learn to use, new technology are likely to experience less anxiety when that new technology is introduced.
  - A third consideration is economic.
    - Does the new technology promise competitive advantage to an organization or to an individual in his or her personal life?
    - If so, the organization or individual is more likely to implement it.
  - Finally, it also is important to consider the role of social factors in the acceptance of technology.
- If technology is to enable people at work, it should foster self-motivation and well-being, key elements of self-determination theory; enhance productivity; and promote job satisfaction, organizational commitment, and citizenship behaviors among workers.
  - Feelings of oppression occur when technology leads to a lack of autonomy,

competence, and relatedness.
- In turn, these lead to stress, demotivation, and counterproductive work behaviors.

Summary

Technology is changing the manner in which businesses create and capture value, how and where we work, and how we interact and communicate. In this chapter, we examined the effects of technology in nine key areas of HR management: business leadership, compensation and benefits, diversity, employee relations, labor relations, organization and employee development, safety and security, recruitment and staffing, and HR risk management. The most central use of technology in HRM is an organization's human resource information system (HRIS). An HRIS provides a single, centralized view of the data needed to execute HR processes, such as recruiting, applicant tracking, payroll, time and attendance, training, performance management, benefits administration, and employee self-service. Many different HRIS platforms are available, but to choose the one that is best for any given organization it is necessary to address seven key issues:

- What do you want the system to do?
- Make the business case for an HRIS
- Compare vendors
- Match technology to organizational needs
- Don't overlook finance or information technology (IT)
- Assess end users' experiences
- Address implementation issues

HRIS also bring challenges, such as new skills and roles for HR staff members, more distant HR staff, the need to demonstrate improvements in the quality of decisions, and the need to increase the comfort levels of all employees with HR technology. The chapter closed by considering five emerging trends in HR technology: the expansion of social networking; the growth of compliance and reporting requirements; more renting, less buying of services; growth in the use of data analytics and dashboards; and more transparent HR policies, leading to increasing concerns about protecting the integrity and privacy of employees' data.

Answers to Discussion Questions

2-1. Describe how technology has changed the ways that you live and work.

Technology has affected the following nine key areas of HR management:

- Business leadership: Technology is an ever-present focus for leaders because it is constantly evolving, and because it affects the ability of their organizations to be competitive, to stay ahead of the curve.

- Compensation and benefits: Many employers use technology in benefits administration.
- Diversity: People with physical disabilities play important roles in increasing diversity in organizations, and advances in assistive technology have dramatically increased job opportunities for them.
- Employee relations: The move to a technology-driven, mobile workforce where employees are accessible at all times via mobile phone and e-mail is a double-edged sword. The challenge for managers is to promote a culture that balances on that fine line. Social media present a special challenge for HR. Although business-related social-networking sites are great sources for talent sourcing, networking, and advertising, there is also a need for organizations to devise social-media policies that will protect their brands from slander or libel from employees or competitors.
- Labor relations: The National Labor Relations Board has held that employees have no legally protected right to use an employer's e-mail system for organizing or other legally protected, concerted activity.
- Organization and employee development: Three areas in particular have benefited from HR technology: workforce planning, e-learning, and tools to promote collaboration. Talent analytics is playing an ever more significant role in workforce planning, for example, by identifying talent gaps in workforce forecasts, high-potential employee segments that are at risk of leaving, and the potential redeployment of surplus employees in existing talent segments. Technology-based electronic (e-) learning can often generate savings in time and cost over traditional, classroom-based learning. With respect to collaborative tools, there are two broad groups: Web-based and collaborative media platforms. Web-based tools include blogs, wikis, and social networking sites where people mine and exchange information. Collaborative media platforms are specialized tools for various disciplines, from sales to supply-chain management. They also support various HR processes—for example, recruitment and performance management (360-degree feedback that incorporates ratings from superiors, peers, and subordinates). Other tools in this category include file-sharing sites and other spaces where teams can collaborate on projects to share information in a private, secure setting.
- Safety and security: The most common use of HR technology is a human resource information system (HRIS). HRIS allow organizations to sort information so that it can be used for record keeping, reporting, and business decision making. HRIS also facilitate the documentation and management of training activities, many of which are required in safety-sensitive or other positions. Beyond that, they facilitate electronic communications, digital access to key login information, data management from security cameras, and, by incorporating proper safeguards, employee protection from identity theft.
- Recruitment and staffing: A vast and ever-increasing array of technology is available

to assist organizations with recruitment and staffing management: applicant-tracking software, Web-based applications, cloud computing, mobile apps, and video products. At a general level, HR technology is used widely to source talent, to track applicants through the various steps of the recruitment-selection process, and to facilitate background investigations, job analyses, and applicant screening. In recruiting, the most robust applicant-tracking systems record and analyze data to meet EEO and government-contractor requirements. To market their job openings more strategically, some employers are using real simple syndication (RSS) to reach job seekers via e-mail or text message as soon as a new job is posted. Finally, self-service portals allow applicants to manage multiple applications at once as their multimedia résumés display text, photos, videos, and sound. When it comes to applicant screening, thousands of employers use e-Verify, a free Web-based tool from the Social Security Administration and the Department of Homeland Security to verify a match between employees' names, Social Security numbers, and immigration information.

- HR risk management: With respect to HR technology, the primary concern is operational risks that might impede a firm's ability to meet its operating and strategic objectives. Two key subareas include policies and procedures that define internal controls and vendor management and sourcing. In the digital age, a major area of internal controls is the responsibility to ensure that employees' personal information is protected. Risks run the gamut from the release of sensitive data to the wrong manager to major security breaches or hacks that expose employees' personal information to external, unknown sources.

2-2. Always-on technology, such as e-mail and smartphones, has promises as well as perils. Discuss alternative strategies for avoiding overwork and burnout.

Students' answers will vary. The move to a technology-driven, mobile workforce where employees are accessible at all times via mobile phone and e-mail is a double-edged sword. On the one hand, it allows employees to work flexible hours or remotely. On the other hand, it can promote overwork and burnout. Some strategies for avoiding overwork and burnout are as follows:

- Organizations can implement a flextime policy that allows employees to work at their hours of peak productivity.
- Organizations can implement a policy that prohibits employees from working during the weekends and past their working hours unless the project demands for it.
- Organizations could also implement policies that promote employees to take vacation and breaks from their work.
- Organizations could also mandate employees' involvement in employee engagement programs to enable them to take a break from their work.

2-3. If an organization decides to use biometrics for security reasons, what can it do to protect personal privacy?

Students' answers will vary. An application of technology in employee relations is biometrics—unique physical and behavioral features (such as fingerprints or eye pupils) that can be sensed by devices and interpreted by computers to bond digital data to personal identities. Biometrics can increase efficiency, prevent fraud, and ensure the safety of workers. At the same time, however, organizations using them must balance employee privacy and security. In the digital age, a major area of internal controls is the responsibility to ensure that employees' personal information is protected. Risks run the gamut from the release of sensitive data to the wrong manager to major security breaches or hacks that expose employees' personal information to external, unknown sources. Sensible policies and security protocols can minimize the risk of security breaches. Some examples of such policies and protocols are as follows:

- Multifactor authentication (requiring not only a password and user name but also something that only a user has, such as a code sent to his or her smartphone in order to log in to a Web site)
- Encrypting sensitive data
- Restricting the type of data that can be shared in the cloud or on social media

Finally, organizations should be vigilant with vendors that require personal data. Some organizations require all vendors to meet or exceed specified levels of IT security protocols as a condition of doing business with them. It's also important to understand what steps a vendor will take in the event of a breach.

2-4. Technology alone is not sufficient to ensure a successful implementation of an HRIS. What else is necessary?

Successful implementation is critical, and the first step is to be crystal clear about the underlying objectives for the new HRIS. To accomplish work in the digital age, the majority of new HRIS are in the cloud, and the top four reasons for replacing an HRIS are as follows:

- To have a single system of record for HR data
- To ensure reliable, consistent reporting for compliance and legal obligations
- To standardize HR data across multiple geographies or business units
- To move away from legacy systems that were not meeting organizational needs

These become important criteria for assessing the effectiveness of the new HRIS. A detailed treatment of system integration is beyond the scope of this chapter, but a key issue

for the integration team is to verify the accuracy and integrity of the data in the new system. Members of the software team and the functional HR team should test each module to ensure that it works as intended, and that it produces accurate data. Upgrading or purchasing a new HRIS is a multifaceted undertaking, and there are many potential roadblocks that can hinder success.

2-5. Identify three types of security procedures that can help to minimize the risk of security breaches.

The three types of security procedures that can help to minimize the risk of security breaches are as follows:

- Multifactor authentication (requiring not only a password and user name but also something that only a user has, such as a code sent to his or her smartphone in order to log in to a Web site)
- Encrypting sensitive data
- Restricting the type of data that can be shared in the cloud or on social media

2-6. What are some examples of HR risks?

Students' answers will vary. HR risk refers to the uncertainty arising from changes in a wide range of workforce and people-management issues that affect a company's ability to meet its strategic and operating objectives. Such risks typically fall into four main categories:

- Strategic risks
- Compliance risks
- Operational risks
- Financial risks

Examples of strategic risks could include making poor decisions, executing such decisions, and failing to respond to changes in industry. Examples of compliance risk could include failure to comply with the workplace health and safety practices; illegal practices such as bribery, fraud, and insider trading; and business activities that violate the law. Examples of operational risks could include machinery repairs and breakdowns, process failures, and human error while performing business activities. Examples of financial risks could include taking a loan that the business cannot repay, investing in shell corporations, and unsuccessful mergers and acquisitions.

2-7. What are the advantages and disadvantages of on-premise versus SAAS HRIS?

Students' answers will vary. On-premise platforms are software platforms housed in

privately controlled data centers. An advantage of this technology is that the data is stored within the organization. A disadvantage of this technology is that it is too expensive and requires a lot of investment in technology.

Software-as-a-service (SAAS) systems are subscription-based software paid on a month-to-month basis. Advantages include vendor responsibility for maintaining and updating the software, access from any device with a Web browser and any location with Internet service, cost based on employee headcount, and data managed on remote servers. If disaster strikes an organization (e.g., a fire, a tornado, an earthquake) HRIS data are not lost.

On the other hand, one of the disadvantages to using an SaaS approach is that the software is not customizable to the specific needs of an organization. Firms either find a solution that best matches their needs or change their processes to fit a particular system. For organizations with existing systems, full integration of old and new systems can be challenging. Finally, access to the software can be disrupted due to a faulty Internet connection, vendor maintenance, or if a vendor goes out of business.

2-8. How might HRIS affect employees, managers, and HR team members?

When comparing alternative HRIS, it is critical to assess the experiences of end users. This is one reason a demonstration-only from different vendors is not enough. Various types of users need to experience the HRIS features for themselves. If employees or managers will use the system, there are high expectations for a user-friendly, consumer-grade technology experience. Managers may use the system to modify or approve time sheets or performance reviews. Inputs from all three groups can provide valuable information when choosing an HRIS that best fits an organization's needs.

2-9. You have been charged with choosing an HRIS. What key factors will you consider?

The factors to consider when choosing an HRIS are as follows:

- What do you want the system to do?: The first step is to develop a deep understanding of top management's long-term goals and objectives in order to create buying criteria for a long-term solution. An organization poised for aggressive growth will have different needs than one that is shedding assets and reducing its operations. Begin by identifying immediate problems to solve as well as longer-term challenges. Immediate problems might include reducing human error in data management, reducing cycle time in recruitment, or remaining compliant with regulatory or legal requirements. Longer-term challenges might be to create a positive employer brand by enhancing each applicant's experience, gaining a first-

mover advantage in recruiting, or improving new-hire on-boarding experiences.

- Make the business case: In addition to the needs of HR, the business case for an HRIS will be stronger if one can address the concerns of senior managers and show how the software will affect other departments. In short, try to anticipate issues that will affect key players.
- Compare vendors: Consider three broad strategies for adopting HR technology.
  - an integrated system from a single vendor
  - best of breed (select the best applications in each area from multiple vendors)
  - outsource HR technology infrastructure to a third-party vendor

  There is no single best system, as organizations vary in their needs, resources, and priorities. When comparing vendor systems, start by identifying a small number of main uses of the HRIS—say, three or four—and ask each vendor to demonstrate how it addresses each one. Smaller organizations with limited internal staff and resources to draw on need strong implementation and customer support from the vendor of choice.

  Here are two other recommendations: One, people demonstrating the software know how to hide usability issues. Test each system yourself before one spends money and rolls out the software companywide. Two, beware of a vendor that is unwilling to say, "Our system doesn't do that." If the answer to every question is yes, then something is probably wrong.

- Match technology to organizational needs: Knowing "need-to-have" HRIS features in advance helps protect an organization from paying for nonessential, but perhaps "nice-to-have," features.

- Don't overlook finance or IT: When choosing an HRIS, a big mistake for any organization, large or small, is to fail to include representatives from finance and IT in the vendor-selection process. IT should provide critical information about the types of features and platforms it is able to support, including software setup and maintenance, as well as requirements for data security. Finance needs to endorse the business case for an HRIS, particularly the expected payoffs for the organization. Beyond that, a basic concern for finance is for an integrated payroll module or for an HRIS that will work smoothly with the payroll system that is already in place.

- Assess end users' experiences: When comparing alternative HRIS, it is critical to assess the experiences of end users. This is one reason a demonstration-only from different vendors is not enough. Various types of users need to experience the HRIS features for themselves. If employees or managers will use the system, there are high expectations for a user-friendly, consumer-grade technology experience. Managers

may use the system to modify or approve time sheets or performance reviews. Inputs from all three groups can provide valuable information when choosing an HRIS that best fits an organization's needs.

- Implementation issues: Successful implementation is critical, and the first step is to be crystal clear about the underlying objectives for the new HRIS. To accomplish work in the digital age, the majority of new HRIS are in the cloud, and the top four reasons for replacing an HRIS are as follows:
  - To have a single system of record for HR data
  - To ensure reliable, consistent reporting for compliance and legal obligations
  - To standardize HR data across multiple geographies or business units
  - To move away from legacy systems that were not meeting organizational needs

  These become important criteria for assessing the effectiveness of the new HRIS. A detailed treatment of system integration is beyond the scope of this chapter, but a key issue for the integration team is to verify the accuracy and integrity of the data in the new system. Members of the software team and the functional HR team should test each module to ensure that it works as intended, and that it produces accurate data.

Upgrading or purchasing a new HRIS is a multifaceted undertaking, and there are many potential roadblocks that can hinder success. Following the seven steps outlined above, one can ensure that this HR technology will perform successfully for years to come.

2-10. Recommend three strategies for protecting employees' personal information.

Students' answers will vary. Some strategies for protecting employees' personal information are as follows:

- Implement multifactor authentication (requiring not only a password and user name but also something that only a user has, such as a code sent to his or her smartphone in order to log in to a Web site).
- Encrypt sensitive data.
- Restrict the type of data that can be shared in the cloud or on social media.
- Explain HR policies and specific steps your organization is taking to ensure that.
- Offer ongoing, companywide awareness and training programs around cybersecurity.

CASE 2-1: Automation Reshapes the Workplace

The robots are coming! The robots are coming! Well, not so fast. According to a 2017 study from the McKinsey Global Institute, only 5 percent of all occupations are at risk of being entirely automated by 2025. Even when the technical potential exists, the study's authors estimate it will

take years for automation's effect on current work activities to play out fully. The pace of automation, and thus its impact on workers, will vary across different activities, occupations, and wage and skill levels. Factors that will determine the pace and extent of automation include the ongoing development of technological capabilities; the cost of technology; competition with labor, including skills and supply and demand dynamics; performance benefits, including and beyond labor-cost savings; and social and regulatory acceptance. Still, the study concludes, automation could raise productivity growth globally by 0.8 to 1.4 percent annually.

Workers themselves are not down on automation. In an Accenture survey of more than 10,000 workers, 87 percent felt optimistic about how technology will change their jobs in the next 5 years. Nearly the same number said they feel ready for those changes. About half of the respondents were described as high skill, with the rest split evenly between low- and medium-skill levels. Ominously, however, a majority said their employers are not providing the kind of high-quality training they need to keep their skills fresh. The bottom line is that jobs will change dramatically, and that will force workers to adapt to the changes.

Case Questions

1. As a manager, what can you do to help employees adapt to changes brought by automation?

   Students' answers will vary. Some ways that organizations can help employees adapt to changes brought by automation are as follows:
   - Offer ongoing, companywide awareness and training programs on new technology.
   - Offer programs that motivate employees to be up to date with the latest technologies, such as the policy to reimburse the costs of a particular software course.
   - Implement a policy that mandates employees to spend some part of their work hours in learning new technology.

2. What responsibility, if any, do organizations bear for helping workers adapt to technological changes?

   Students' answers will vary. Organizations bear some responsibility in ensuring that their employees are up to date with the technology changes. After hiring employees, HR personnel must discuss the employees' career plan in the organization. The HR personnel can help employees who are uncertain about their career plan to identify their interests and possible career plan. They should help employees meet the requirements for them to transition to the next stages of their career plan.

3. How would you advise workers themselves to adapt to changes in their jobs due to

automation?

Students' answers will vary. Workers should be intrinsically motivated to adapt to changes in their jobs due to automation. They can take courses to learn about technology and read articles to be up to date with the new upcoming technologies.

4. Might organizations use their strategies for adaptation to technological change as a retention strategy? How?

   Students' answers will vary. Organizations can use their strategies for adaptation to technological change as a retention strategy. They can do that by providing companywide awareness and training programs about the technological change and its effect on employees' jobs. These programs can also address employees' concerns about their job security and their career growth in the organization.