TRANSFORMING HR THROUGH TECHNOLOGY

THE USE OF E-HR AND HRIS IN ORGANIZATIONS

By Richard D. Johnson and Hal G. Gueutal

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Dear Colleague:

Human resource management is evolving into a more technology-based profession. In many organizations, employees now see the face of HR as a portal rather than a person. This transformation of HR service delivery is known as “e-HR,” and implementing e-HR requires a fundamental change in the way HR professionals view their roles.

This new report, *Transforming HR Through Technology: The Use of E-HR and HRIS in Organizations*, will help you to explore both the opportunities and the potential pitfalls of HR technology. According to recent studies, organizations that successfully adopt sophisticated HR technology tools outperform those that do not. This report will help you to better leverage e-HR to transform your HR practices and market your HR brand.

In 2004, the SHRM Foundation created this Effective Practice Guidelines series for busy HR professionals like you. We understand that it’s a challenge for practitioners with limited time to keep up with the latest research results. By integrating research findings on what works with expert opinion on how to conduct effective HR practice, we make theory and practice more accessible to you.

Recent reports in this series include *Onboarding New Employees, The Search for Executive Talent, Employment Downsizing and Its Alternatives*, and *Human Resource Strategy*. This report is the 13th in the series. Subject matter experts write the reports, which are then reviewed by both academics and practitioners to ensure that the material is research-based, comprehensive and practical. Each report also includes a “Suggested Readings” section as a convenient reference tool. All reports are available online for free download at [www.shrm.org/foundation](http://www.shrm.org/foundation).

The Effective Practice Guidelines series is just one way the SHRM Foundation supports lifelong learning for HR professionals. In addition to creating educational resources, the SHRM Foundation awards more than $150,000 annually in education and certification scholarships, and is a major funder of original, rigorous HR research that expands the HR knowledge base. I encourage you to learn more. Please visit [www.shrm.org/foundation](http://www.shrm.org/foundation) to find out how you can get involved with the SHRM Foundation.

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The term “e-HR” describes the transformation of HR service delivery using web-based technology. Now HR professionals must not only master traditional HR skills and knowledge, but also have the ability to apply that knowledge via technology.
TRANSFORMING HR THROUGH TECHNOLOGY

THE USE OF E-HR AND HRIS IN ORGANIZATIONS

Today the face of HR is often a portal, rather than a person. Almost all firms now provide universal access to HR services through technology and web-based applications, dramatically changing the practice of human resource management. These changes often result from the need to cut costs and expand or improve services. Recent research shows organizations that successfully adopt sophisticated HR technology tools outperform those that do not. But because most organizations already have automated basic HR administration, the simple automation of HR processes can no longer assure a competitive advantage. Instead, organizations must determine how to use technology to transform their HR practices and market their HR brand.

HR is evolving into a more technology-based profession because organizations need to:

• Streamline HR processes and reduce administrative burdens.
• Reduce HR administration and compliance costs.
• Compete more effectively for global talent.
• Improve service and access to data for employees and managers.
• Provide real-time metrics to allow decision-makers to spot trends and manage the workforce more effectively.
• Enable HR to transform so it can play a more strategic role in the business.

The term “e-HR” describes the transformation of HR service delivery using web-based technology. Implementing e-HR requires a fundamental change in the way HR professionals view their roles. Now HR professionals must not only master traditional HR skills and knowledge, but also have the ability to apply that knowledge via technology.

This report focuses on human resource information systems (HRIS), or the integration of hardware, software and business processes used to implement an e-HR approach. HR departments often provide broader and more effective services when they operate via a web portal. For employees and
applicants, this means relying on HRIS for most HR services. One potential downside to this approach is that personal relationships between the organization’s employees and HR staff may disappear.

An HRIS can be as simple as a small employee database, developed internally by a company with a few employees, or as complex as fully integrated, multimillion-dollar Enterprise Resource Planning (ERP) software that offers economies of scale to large firms. There also are many variations in between.

This report explores current research about HRIS, including:

- Implementation strategies available to HR executives moving toward e-HR.
- The use of HR technology to support recruiting, selection, training, performance management, compensation and benefits administration.
- The effectiveness of e-HR and its acceptance by employees.
- Issues influencing the strategic use of e-HR technology.
- Avoiding common pitfalls in a technology-based HR delivery model.

This report focuses on broad impacts on core HR functions likely to affect the majority of organizations. When adopting an e-HR approach or implementing an HRIS, keep in mind this is not an exhaustive set of issues to consider. Some functions are not discussed here in detail because of a lack of independent research. Additional strategic issues, such as vendor selection, managing vendor relationships, data integrity and cross-border data sharing are important, but simply beyond the scope of this report.

Implementation of HRIS: What Are the Options?

Once your firm has decided to implement technology as part of an overall HR strategy, there are many options. Although it is possible to develop technology in-house, using external vendors is generally more cost effective and often will provide a more complete HR solution. The wide selection of vendors and variety of products can be daunting. The first order of business is to decide whether to use a single platform, or integrated solution, to support multiple HR functions or to use multiple smaller systems, sometimes known as “best of breed” solutions, each supporting a different HR function.

AN INTEGRATED SOLUTION

If your firm chooses this strategy, you will work with a single vendor to develop one platform that incorporates multiple HR functions. Often these platforms are part of an enterprise-wide information system architecture that includes a variety of business functions such as a general ledger, customer relationship management and logistics.

A ‘BEST OF BREED’ SOLUTION

If your firm decides to pursue a best of breed, or BoB, strategy, you will consider multiple vendors and then pick the best applications for each functional area of HR. In this approach, an organization may work with one or more vendors to supply HRIS functionality. The firm might use a recruiting solution from one vendor, a time and attendance solution from a second, and a payroll solution from yet a third provider. This can be an attractive approach for smaller businesses without the resources to purchase a single comprehensive solution, or for those that want to use technology selectively, as part of the overall HR strategy. The advantages and disadvantages of each approach are discussed in a figure on the next page.
## Comparing Integrated and Best of Breed Solutions

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<th>Advantages</th>
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| **Integrated Solutions** | • Feature a common interface “look and feel” across applications, making learning and transitions for users easier.  
• Use integrated data and technological infrastructure, reducing the need to manage multiple technological architectures.  
• Provide greater ease of integrating data from multiple HR functions.  
• Reduce the complexity of vendor management, because there is only one vendor.  
• Can be less expensive per application to implement than BoB. |
| **Best of Breed Solutions** | • Can develop a “best fit” solution for each functional area.  
• Provide quicker implementation, because the system is simpler and affects fewer employees.  
• Do not lock into a single vendor for all needs.  
• Allow vendors to be more responsive to user needs.  
• Make it possible to purchase only the functionality needed. |

<table>
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<tr>
<th>Disadvantages</th>
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| **Integrated Solutions** | • Offer minimal customization options. Because of the large scale and integrated nature of such solutions, they can be prohibitively expensive to customize, or maintain customizations, as new versions of the underlying package are released.  
• Do not necessarily offer the best solutions in each functional area.  
• Are challenging to upgrade, because a change to one function may have dramatic impacts on others.  
• Slow down the introduction of new features and upgrades due to complexity. |
| **Best of Breed Solutions** | • Pose difficulties in integrating data across applications.  
• Present increased learning curves for each application because of the lack of consistent interface.  
• Require careful management of relationships with multiple vendors, which can be challenging.  
• Demand interoperability among different applications, which may not be easy. |
When deciding whether to pursue an integrated or best-of-breed solution, it also is important to decide how to deliver the technology. Three approaches are popular:

1. **On-premise, or purchase and install.** With the on-premise approach, the organization will purchase and install hardware and software on internal machines supported by internal IT staff. This can be relatively time-consuming, but traditionally was the only approach available.

2. **Hosted, or application service provider.** In the hosted approach, applications are purchased and installed for the organization, but they are located at the vendor’s site and supported by external IT staff.

3. **Software as a service (SaaS).** With SaaS, the firm does not purchase or install any software. Instead, the organization subscribes to software that is developed and deployed remotely and accessed via a web browser. Vendors offer many organizations access to the same package (known as multi-tenancy) and will maintain the software for each organization. SaaS is less attractive to organizations that already have invested heavily in HR technology, because the previous investments may be wasted. SaaS also is less attractive for firms that want customized software, because vendors offering multiple organizations the same software on a common platform will not be able to customize the software to each organization’s needs.

Both hosted and SaaS approaches can be effective for organizations without the resources or the technical expertise to implement a large, integrated system. And many vendors are beginning to market SaaS applications to small and mid-size businesses that want to provide employees with HR services similar to those at larger competitors.

**ACCESS TO HR DATA**

One of the most significant changes in the practice of HRM has been the “democratization” of HR data—the rapid expansion of access to such data by groups inside and outside the organization. As recently as a few years ago, only HR staff members worked with personnel data. Today, employees, managers, health insurers, workers’ compensation carriers, senior executives, job applicants and even regulatory agencies have access. But with all these different types of users come different needs. For example, executives use summary data from the system to aid in strategic decision-making, and applicants draw initial impressions of the organization from the corporate recruiting website. Other examples appear in the chart on the following page.

In addition to meeting the needs of diverse users, an HRIS also should be designed to accommodate several different methods of access.

**HR portals** provide a single, targeted and often customized access point for each employee (and increasingly, each job applicant). The HR portal allows an individual to access the resources and data relevant to his or her own personal situation and job. Each employee can design an interface to view the most
relevant data. Most HR portals are also web-enabled, allowing employees to access HR services anywhere and anytime, using devices ranging from laptop computers to smart phones and tablets. The use of an HR portal also can help HR better brand itself to employees by showcasing the products and services the HR department offers. Today, the inclusion of an HR portal should be considered an important strategic opportunity in any system upgrade.

Employee self-service (ESS) is an approach in which employees access and maintain their personal HR data. Nearly 90 percent of recently surveyed organizations indicated they had or were planning to implement self-service applications. ESS websites, often enabled through the HR portal, allow many HR questions and transactions to be handled directly by employees. A well-designed ESS allows employees to make informed choices and to become self-reliant for many HR services. For employees, this means increased convenience; for organizations, this means significant cost savings. Research suggests when organizations implement an ESS, HR headcount often is reduced by as much as 25 percent.

Manager self-service (MSS) applications also are tools that can be accessed via a portal. These tools allow supervisors to handle many HR transactions online and receive HR reports in real time. For example, a manager might use MSS to prepare for and complete performance appraisal documentation for subordinates, to authorize leaves or to create a report summarizing information about his or her staff. Organizations can choose the amount and complexity of HR tasks to be delegated to managers via the MSS, including:

- Allowing managers to view information and create reports on the employees working for them without having to rely on HR.
- Allowing managers to complete transactions previously handled by HR, such as authorizing pay raises, promoting, approving leave requests or changing an employee’s classification.
- Allowing managers to manage HR functions such as performance management, succession planning and onboarding.

As with ESS, when managers handle transactions, HR budgets will see savings. For example, GreenbergFarrow, a small construction firm with two HR employees, was able to save 10 to 15 hours per week of HR staff time when MSS went live, and double that number during open enrollment.

### Examples of HR Data Accessed by Various Stakeholders

<table>
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<tr>
<th>Position</th>
<th>Types of Data Accesssed</th>
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<tbody>
<tr>
<td>Employees</td>
<td>Benefits enrollment. Personal data. Dependent data. Retirement planning scenarios.</td>
</tr>
<tr>
<td>Executives</td>
<td>Data for HR forecasting and costing. Succession plans.</td>
</tr>
<tr>
<td>External Groups</td>
<td>Time and attendance data. Dependent health insurance status. Payroll information. COBRA status.</td>
</tr>
</tbody>
</table>
There are several factors affecting the extent to which an HRIS is used. First, employees need to be convinced of the value the HRIS brings to their jobs. This often means providing accurate, timely information, increasing convenience and saving employees’ time. If the HRIS is seen as making jobs easier, users will embrace the change. We all have been “trained” to go to the Internet for all sorts of information and services, and employees expect to be able to access their HR information and complete HR tasks via the Internet. If employees can save themselves time—say, by submitting attendance information online or by comparing health plan options electronically—system use becomes less of an issue.

The challenge for most organizations using an e-HR strategy is not whether employees will use HRIS, but rather how to encourage employees to fully use the system and be self-reliant for their data needs. How can value and cost savings be maximized through more effective use of the system? Organizational support, such as the quality of online help resources, is the key to success when implementing new software.6

Work culture also can affect the acceptance of these systems. A system designed for use in Europe or the United States may not work in other parts of the world. Beliefs about the organization’s obligations to employees, data security and privacy, and the role of HR can differ dramatically from country to country and region to region. An effective design in one location may be met with resistance in another.

MSS and Compensation Planning at Motorola

Motorola had a problem. As a global corporation with more than 10,000 employees in 65 countries, the firm had a myriad of compensation practices that varied not only among countries, but also among divisions within the same country. Motorola’s goal was to develop a compensation plan to standardize pay practices and involve all levels of management in pay decisions, including first-level supervisors. Although it moved to a shared-services approach for delivering HR in 1998, Motorola had yet to fully integrate standardized pay practices across the globe.

Using MSS, Motorola imported data from an external performance management system and integrated this into a data warehouse. Managers were empowered to make pay decisions regarding how to reward employees with stock, short-term incentives and salary. Business rules ensured that reward distributions within and between divisions were equitable. Managers were able to complete this task within four weeks. Two additional weeks were taken to review the data. The MSS handled more than 10,000 individual sessions within a 24-hour period without crashing. Thus, using MSS, Motorola was able to implement a standardized compensation plan for 10,000 employees in 65 countries within a six-week timeframe. The goal for the following year: reduce the timeframe to four weeks.

SHRM Case Study: Manager Self-Service
www.shrm.org/hrdisciplines/technology/Articles/Pages/CMS_006604.aspx

WILL EMPLOYEES HAVE ACCESS?

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SHRM Case Study: Manager Self-Service
www.shrm.org/hrdisciplines/technology/Articles/Pages/CMS_006604.aspx
When implementing an HRIS across national boundaries, issues associated with data privacy and data movement across these boundaries must be kept in mind. Different countries and regions have enacted laws and policies that can significantly affect the design and implementation of the HRIS. Global corporations must strike a balance between global consistency and local flexibility when implementing new technology.

Similarly, when an organization adopts an HRIS, that solution may have built-in processes and procedures that are not compatible with existing practices and corporate culture. For example, an out-of-the-box application might require employees to seek managerial approval for time off, but the company’s policy and culture may have no such requirement. Failing to modify the system could cause employees to feel that the company no longer trusts them, and these feelings could lead to lower morale and turnover. A new HRIS will change the organization’s HR practices and processes, so it is critical to evaluate the fit between the policies embedded in the new HRIS and the organization’s current ways of managing HR issues.

**ACCESS FOR DECISION MAKERS**

One of the main purposes of an HRIS is to create reports and to support managerial decision-making. As compliance reporting requirements increase, and more data and analysis are required, an HRIS becomes even more valuable. For example, proposed changes in health care included in the Patient Protection and Affordable Care Act will require more reporting to the federal government, and the ability to generate those reports will depend on the sophistication of a firm’s HRIS technology.

**Data warehouses** and **data mining tools** now also are used to support strategic decision-making. Analyses previously impossible because of a lack of data or because they were not cost-effective can now be completed and complex questions answered. Data warehouses provide a centralized repository of selected HR data that is managed separately from live data. Data mining tools with advanced statistical data analysis techniques can then be employed to discover relationships among policies, procedures, practices and organizational outcomes that may not be readily apparent. Common uses of data mining techniques include questions related to manpower planning, predicting turnover, validating tests and monitoring HR practices for disparate impact.

An **HR dashboard** provides high-level, real-time data related to the most critical measures of HR success. This is done in a visual fashion, similar to the dashboard on a car. Dashboards allow managers to examine information in greater levels of specificity, which can help to quickly identify and focus on potential problem areas. By linking the data on the dashboard to the key organizational metrics, managers can more effectively see the ties between HR outcomes and corporate goals.

Certainly, the use of technology to support HR analytics will continue to evolve, and organizations should pay attention to the advances in these techniques and the ways in which they can enhance HR effectiveness.
Transforming HR Through Technology

USING HR TECHNOLOGY

E-RECRUITING

The web-based technology used by e-recruiting helps organizations attract a stronger and more diverse applicant pool. The choice to move to an e-recruiting model is driven by several business objectives, including the need to:

- **Improve recruiting efficiency and reduce costs.** Online recruiting can cut cycle times by 25 percent, and can reduce recruitment costs by more than $8,000 per hire—a 95-percent reduction.7

- **Increase quality and quantity of applicants.** E-recruiting allows organizations to conveniently reach applicants across the country or around the globe.

- **Establish, communicate and expand brand identity.** In an informal study by the authors of this report, approximately 100 job-seeking college students were asked to evaluate two unfamiliar firms based on their web presence. The students saw the firm with a less technologically advanced and dynamic recruiting website as a less attractive employer, and as failing to be a leader in its industry (even though it was). The students said that the website communicated a lack of innovation and quality within the firm.

- **Increase the objectiveness of, and standardize, recruiting practices.**

- **Increase applicant convenience.** Potential applicants who take advantage of web-based support for the recruitment cycle find out about the company, its culture and opportunities online. By making this process more convenient, organizations reach out to those who may not be actively looking for other opportunities, but who may discover a position and choose to apply because of the ease of submitting an application.

Organizations are rapidly adopting e-recruiting tools. A recent survey found that nearly 75 percent of organizations are using technology to support recruitment, and this number is expected to grow to nearly 85 percent within the next year.8

Approaches to implementing e-recruiting vary, but include the use of a corporate recruiting website; general online job boards, such as Monster, HotJobs and CareerBuilder;

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**Data Mining Helps HR Answer Key Staffing Questions**

Hiring and retaining the best talent is critical to any firm. Given the cost of recruiting and developing highly skilled technical talent, knowing on whom to focus retention effort can present a significant competitive advantage. Organizations such as IBM, Oracle, Capital One and SAS are increasingly turning to data mining to help identify and retain top talent. For example, by mining data on the relationships among factors such as university attended, previous work experience and previous employers, Microsoft was able to develop a plan to target certain universities and companies for future hiring.

Firms also use data mining to reduce turnover. Using turnover data from the past several years, along with statistical models, companies are able to predict which highly skilled employees have the greatest risk of leaving. Those individuals can then be targeted for retention programs and incentives.
industry-specific job boards, such as dice.com, marketingjobs.com; and regional job boards, such as CapitalAreaHelpWanted.com to enhance recruiting efforts. A recent study by SHRM found that although employee referrals are still the source of the highest quality applicants, four out of the top five sources of applicants are web-based.

In addition, 37 percent of surveyed organizations identified web-based recruiting initiatives as generating the highest return on recruiting investments.

Beyond seeking active candidates, more than 50 percent of surveyed organizations noted that they are leveraging the web to find passive job candidates. The use of technological tools to target top candidates who are not necessarily “looking” to change employers is an emerging use of e-recruiting technology. Clearly, e-recruiting has become a central aspect of successful recruiting strategies.

**E-Recruiting and Website Design: Design Plus Content**

Many researchers have focused on how companies can more effectively manage the e-recruiting process and have found organization and navigability of the recruitment website to be critically important. Applicants look for efficiency and ease in navigation, and their experiences influence perceptions about the firm’s image and attractiveness.

Applicant expectations have been shaped by at least a decade’s worth of experience using the web. They expect highly sophisticated and interactive social and consumer websites, subsequently raising the bar for all sites. Organizations that create interactive and aesthetically pleasing, user-friendly websites will be much more likely to convert passive lookers into active applicants. And applicants will be more likely to recommend the firm to others. The impact of website design is magnified for recent college graduates and others who have less work experience. The bottom line is that your firm should not underestimate how much the design of the recruitment website can affect brand image and attractiveness for potential employees.

But it is not only about the aesthetics of your site. The quality of the information provided to applicants also is critically important. Recruitment websites should include information regarding corporate culture, organizational support for professional development, job descriptions and work expectations. Each of these factors has been linked to the organization’s level of attractiveness to job candidates, which, in turn, was related to their intentions to apply for a job. A recent survey by Towers Watson found that the five most important factors applicants consider when making a decision to join a firm are base pay, the challenge of the work, the convenience of the work location, opportunities for career advancement, and vacations and paid time off. The website should highlight these key employment factors so applicants can quickly access the information.

**Web-Based Recruiting: Who Is Considered an ‘Applicant’?**

Given the ease of applying for positions and the need for organizations to keep good records of their recruiting efforts, a concrete definition of the term “job applicant” is valuable. The Office of Federal Contract Compliance Programs (OFCCP) ruled that government contractors must consider a person an applicant if the following four criteria are met:

1. The individual expresses interest in an advertised position through the Internet or related technologies.
2. The contractor considers the individual for employment in a specific position.
3. The individual expressing interest specifies that he or she meets the basic qualifications for the position.
4. At no point in the selection process before receiving an offer does the individual remove his or her name from consideration or indicate that the position is no longer of interest.

Data only need be captured and reported on individuals who meet all four criteria. These guidelines can assist organizations in reducing the burden of record keeping on a potentially large number of resumes from unqualified individuals or those who send in resumes unrelated to any specific position.
In addition, applicants are less likely to be attracted to organizations that take more of a selection-oriented versus a recruitment-oriented approach to designing the website.12

In other words, although the recruiting website can be used for selection, its primary purpose should be to expand and enhance the pool of qualified applicants, rather than to make selection decisions.

One of the major challenges in managing an online recruiting effort is the large volume of applications. In addition to receiving more quality applications, e-recruiting often leads to more unqualified applicants. A well-designed website can reduce the number of applicants who are a poor fit for the company culture or job. For example, an organization that focuses on individual merit and contribution as corporate values can showcase these, effectively persuading potential applicants more comfortable in a team-based work environment to self-select out of the process.

**Potential Pitfalls in E-Recruiting**

Clearly, e-recruiting has dramatically improved efficiency, reduced costs and transformed the management of recruiting in organizations. What about some of the pitfalls?

**Increase in application quantity, but not application quality.** As noted above, organizations that implement e-recruiting initiatives find the volume of applicants increases substantially, so they must be prepared. For example, Sutter Health found that when the company implemented online recruiting, it received 300,000 resumes.13 The company was unprepared for the volume and was unable to process this large number of applicants in a timely way. Preparations for high volume should include updating job analyses, revising workflows, eliminating unnecessary or redundant reviews, and considering the use of screening software to identify more attractive applicants. Remember that although e-recruiting expands the reach of recruiting initiatives, the overall quality and fit of applicants may be lower than is found in traditional recruiting methods, due to the ease of submission. It may well be that a slightly more complex application process will yield more committed and more highly qualified applicants.

**Loss of personal relationships with applicants.** Recruiting can be perceived as more impersonal when it is conducted via the web. Technology can be a barrier to communication and relationship building. Online systems are sometimes viewed by applicants as rigid and impersonal, and such reactions can reduce overall satisfaction with the recruiting process. One of the most important factors in the recruiting process is developing a relationship with the candidate and ensuring that communication sends appropriate signals about the culture of the organization. Social networking initiatives, online webcasts and other targeted communications can help minimize this loss of “high touch” in the recruiting process. Starting with the design of the recruiting website and throughout the recruiting process, companies should incorporate specific steps to establish a personal relationship with potential candidates. It would be a mistake to rely solely on the website to give top applicants a positive feeling about the firm. Instead, it is important to take steps such as personal calls, “snail mail” communications, invitations to webinars and online recruiting events, and other techniques to build a bond with well-qualified applicants.

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**What Do You Do with 43,000 Applications? How about 1 million?**

In 2008 Kia motors began the staffing process for a new manufacturing plant in Georgia. Initially 500 new jobs were planned for 2008, building to 1700 positions by 2009. When the first job posting went live on the web, Kia received more than 43,000 applications in 30 days. Of these applications, 95 percent came from areas near the plant. This outcome demonstrates the power of e-recruiting to attract a pool of applicants for non-managerial positions, even in non-metropolitan areas.

On a broader scale, the Indian government recently sought applications for 15,000 public service positions. It received in excess of 1 million applications through its online recruiting site.
Diversity issues and risk of adverse impact. The implementation of e-recruiting brings with it the need to assess the diversity of the applicant pool and the risk for adverse impact. There is a risk that those from lower socio-economic backgrounds and minorities will be underrepresented in applicant pools generated via web-based applications, as compared with traditional recruiting methods. A major reason for this potential underrepresentation is that these groups may lack access to the Internet. In addition, because the marginal cost for submitting online applications is so low, multiple applications from a small group of unqualified individuals—either a majority or minority group—can mask or create the mistaken appearance of adverse impact.

E-recruiting applications also can blur the definition of the relevant labor market for specific positions and make government reporting more complex. Organizations should closely compare the pre-e-recruiting compliance numbers with those calculated after the implementation of online systems. Be sure to actively monitor talent acquisition processes, to assess the potential of disparate impact and to encourage applications from a diverse group of applicants.

E-SELECTION

E-selection uses technology to help organizations more efficiently manage the process of identifying the best job candidates—those who have the right knowledge, skills and abilities for each job and who may best fit the organization. Faced with pressures to continually improve on the accuracy of selection methods and to meet legal requirements, organizations view technology as a way to manage the selection process more actively and to provide more evidence of the effectiveness of the chosen selection method. The business drivers behind the adoption of e-selection technology include:

- Reducing the time and resources required to manage the selection process. For example, by utilizing e-selection, AirTran Airways was able to reduce the time it took to get new hires up to corporate performance standards by one-third.

- Increasing flexibility in selection test administration. Previously, job candidates would need to visit an in-house or third-party testing center to complete the selection test in a proctored environment. Applicants can now take web-based versions of tests in either proctored or unproctored environments. For example, many retail organizations, such as Lowes, Home Depot and Target, use kiosks near the customer service area to administer selection tests to applicants.

- Improving the utility of selection tests. Although organizations already have the ability to study the validity of a selection test for new hires, an HRIS also can help the organization use longitudinal performance data to assess the effectiveness of the selection test for predicting long-term performance and tenure with the organization.

- Enhancing an organization’s ability to provide adaptive testing of applicants. Adaptive testing can reduce applicant boredom by eliminating questions that are either too easy or too challenging. Research suggests that adaptive testing can reduce testing time by 25 percent to 75 percent, without reducing the reliability or validity of the test.
Job Candidate Responses to E-Selection

Organizations must ensure equivalency between paper-pencil tests and computer/web-based tests. The good news is that a decade’s worth of research on this topic has found computer-based, web-based and paper-pencil based testing to have comparable reliability and validity for many selection tests. In other words, your firm can anticipate that the same candidate taking the same test using different methods should score similarly on each. However, a firm should not assume that simply putting a selection test online will provide the same results as a paper-pencil version. Limited computer experience could cause lower scores on online tests. It is important to verify whether a lower score actually reflects lower ability rather than poor computer skills or poorly designed software. In addition, technological glitches and delays can affect how quickly employees are able to access and complete online tests. The layout and design of online tests may need to be different—and a variety of other factors should be considered when moving selection tests online.

Job candidates generally respond favorably to computer and web-based selection testing. Most of today’s applicants are web-savvy and expect technology to mediate many business transactions, including job search and selection. Computer-based selection methods will continue to grow in attractiveness to candidates and organizations. As with e-recruiting, firms should still consider candidate comfort and experience with technology as they implement e-selection, and provide alternatives for those for whom technology could create a barrier.

What about different types of media: face-to-face interviews, videoconference interviews and phone-based interviews? Research on the differences among these formats shows that those interviewed via videoconferencing tend to have an advantage over those who interview face-to-face, and those interviewed by phone tend to be at a disadvantage in the interview process. Interviewers tend to minimize candidates’ mistakes made in technology-enabled interviews, ascribing them to the challenge of interviewing via this new method. Conversely, interviewers tend not to minimize problems occurring via phone interviews, even though these interviews present the same, if not more, challenges for interviewees trying to communicate their qualifications for the job. To complicate matters, since candidates typically have no choice over the type of technology employed in an interview, and since certain types of candidates do better with one interviewing method than another, the organization’s choice of technology may place some candidates at a disadvantage.

Finally, what about computer based in-basket and situational judgment tests (SJT)? In general, job candidates view such tests positively. For example, in one study job candidates viewed the computerized test as easier and more predictive of their performance. The use of video to deliver the SJT is seen as having higher face validity.
and results in improved performance compared to paper and pencil methods.\textsuperscript{24} Video-based e-selection tools can increase the realism of SJTs, candidate engagement and the accuracy of the test.

**Potential Pitfalls in E-Selection**

Although e-selection has the potential to improve selection accuracy and efficiency dramatically, there are some potential pitfalls to consider before moving to an e-selection strategy.

**Security of content.** With the use of anytime/anyplace testing, there is a risk that materials can be copied, screenshots taken and content leaked. When selection procedures and items are known and can be studied in advance, the selection test will become less effective at differentiating among job candidates, and the utility of the test will be reduced. This is of special concern when unproctored online tests are used. Organizations need to balance the convenience of web-based selection with the need to control the security of information on the test.

**Cheating.** Even the most effective selection test can lose its effectiveness if the person taking the test isn’t the actual job candidate, has the answers to the test in advance or has an unfair advantage as a result of materials brought to the testing situation, such as a smart phone, calculator or web access. Although this may be of less concern for tests without objectively correct answers, the issue is especially relevant for ability and knowledge tests. Therefore, firms should manage the selection process carefully and make available online only those tests in which cheating will not be an issue, or in which it can be effectively controlled.

**Privacy and security of responses.** Another pitfall with online testing is that candidates may be concerned about the security and privacy of their responses. When respondents are concerned about how their data are stored, protected and used, they may be more guarded in their responses, which can reduce the accuracy of those responses. Organizations can address these concerns by making it clear that the information only will be used internally and, where possible, by allowing applicants to opt out of responding to noncritical questions.

**Legality of screening and selection tests.** As with traditional selection tests, it is essential to ensure that any web-based screening technique or selection test is legal. Many online vendors offer various selection tests, but these tests may not withstand legal scrutiny if they cannot be related to the jobs in a particular organization. For example, if a keyword scanning process for resumes causes a protected group to be underrepresented, the organization can be held liable for this outcome, even if the process was developed and managed by a third-party vendor.\textsuperscript{25} So be sure to work with vendors to ensure any screening process used is appropriate for the specific job and organization.

**Best Practices: E-Selection**

✔ Before implementing e-selection, ensure any performance differences on the online test are not related to the delivery method or lack of comfort or experience with technology, but are reflective of underlying knowledge, skills or abilities.

✔ Ensure any online selection test is not only reliable and valid in general, but also for your specific organization. While web-based testing can save time and money, these tools must meet the same standards as paper and pencil tests.

✔ Use unproctored web-based selection to deliver the initial selection tests only when security and cheating are not an issue.

✔ Link the data from selection to other functions, such as the performance management system, to better assess and improve your selection techniques.
When training materials, course interactions and course delivery are enabled by and mediated through technology, your firm is engaging in e-learning or e-teaching. Recent estimates suggest that organizations spend nearly $40 billion on e-learning initiatives, more than double the amount spent in 2004. Although technology is not yet as widely adopted in training as in other areas of HR, nearly 60 percent of recently surveyed organizations indicated they have implemented e-learning or are planning to do so within the next year. The business drivers behind e-learning include:

- **Reducing training costs.** Organizations implementing e-learning can realize dramatic savings, ranging from 40 to 50 percent within a couple of years. For example, IBM reported that it was able to save more than $400 million annually through e-learning.

- **Increasing employee flexibility and control over learning.** Employees value the flexibility e-learning provides, because it can reduce travel and time away from the office and family. In addition, employees are able to take control of their own learning and engage in training at a time and place of their choice, helping them manage their work/life balance.

- **Better tracking and management of employee training.** Specific training often is required by regulators, and documenting successful course completion can be a major burden for organizations. Employees may be required by law to complete OSHA training, sexual harassment courses or patient care procedures. An HRIS can help employees track which courses have been successfully completed and what upcoming training opportunities may fit their needs. Managers can track the training as well, reducing redundancy and training costs.

**Small businesses** can benefit from the use of outside e-learning providers. Many vendors offer online training modules on topics such as technical certifications, health and safety, and leadership skills. By using such resources, a small business can offer employees training and development opportunities comparable to those of larger competitors. This can assist in recruiting and retention of high-potential employees.

**Current and Future Options in E-Learning**

The technology of e-learning provides today’s organizations with a variety of options. In one option, a **Learning Management System (LMS)** can be used to manage the administration, tracking and reporting of training in the organization. By allowing the organization and employees to develop talent and skill profiles, sign up for courses, and register course attendance, an LMS can cut costs, streamline training and empower employees to manage their own skill development more effectively. A second option is the potential use of a **Learning Content System (LCS)**, which manages the delivery and content of courses for employees. Together, these systems help the organization control content, organizational learning processes, and delivery of online material. Ritz Camera used its LMS to develop training materials for retail associates pertaining to new products and services.

**Best Practices: E-Learning**

- **Design courses to promote contact and interaction with other employees.** This can promote the development of learning communities and knowledge networks, improving overall organizational learning.

- **Consider blended learning.** Blended learning can help employees overcome some inherent feelings of isolation by bringing learners together for portions of learning.

- **Course design and sound learning principles should underlie the design of any online course.** E-learning does not mean simply putting existing materials online.

- **Provide training to help employees learn to manage an online environment and to manage themselves in a learning environment that is less structured than a traditional classroom.**
Through the LMS, the firm was able to track completed modules and how well the content was learned.31

Two major shifts are occurring in e-learning strategies. The first is the growing popularity of social web-based tools such as blogs, wikis, Facebook and other “Web 2.0” technologies. At the same time, a new generation of employees who have grown up with technology infused into daily interactions is entering the workforce. The shift to the use of Web 2.0 technologies allows organizations to leverage informal learning through the creation of knowledge networks. If these are designed and implemented effectively, an employee with an important question or skill to learn will no longer need to wait for a scheduled training session. Instead, he or she can search the corporate knowledge wiki or other online knowledge repository to seek information. Tools such as these can help organizations supplement traditional “push” models of training with “pull” models of training, where employees seek and obtain knowledge as they need it. A variety of technologies and approaches are available to help organizations address this changing learning environment.32

**Tailoring E-Learning to the Learners and Making Connections**

It is important to avoid the simple assumption that good technology will produce effective learning. When e-learning initiatives are successful, it is not just the use of advanced technology that leads

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**Various Approaches to E-Learning**

<table>
<thead>
<tr>
<th>Technique</th>
<th>Characteristics</th>
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</thead>
<tbody>
<tr>
<td>Computer-Based Training (CBT)</td>
<td>Individualized training delivered via a computer.</td>
</tr>
<tr>
<td></td>
<td>Often uses CDs or DVDs of text and/or video.</td>
</tr>
<tr>
<td></td>
<td>The most popular method of e-learning.</td>
</tr>
<tr>
<td>Web-Based Training (WBT)</td>
<td>Similar to CBT, but training delivered via the web.</td>
</tr>
<tr>
<td>Webcasts/Webinars</td>
<td>Live web-based delivery of instruction to trainees in remote locations.</td>
</tr>
<tr>
<td>Podcasts</td>
<td>Web-based delivery of pre-recorded audio and video files.</td>
</tr>
<tr>
<td>Mobile Learning</td>
<td>Delivery of training through handheld mobile devices such as smart phones or MP3 players.</td>
</tr>
<tr>
<td></td>
<td>Good for targeted, short training for employees who are away from the workplace.</td>
</tr>
<tr>
<td>Distributed or Distance Learning</td>
<td>Training remotely delivered, often via the web.</td>
</tr>
<tr>
<td></td>
<td>Instructor and trainee(s) are in different locations; training materials and delivery are mediated via technology.</td>
</tr>
<tr>
<td></td>
<td>Course communication is supported through tools such as chat, e-mail and online discussions.</td>
</tr>
<tr>
<td>Hybrid or Blended Learning</td>
<td>Training approach in which learning occurs both in a classroom and over the web.</td>
</tr>
<tr>
<td>Wikis</td>
<td>Websites that allow many users to create, edit and update content and share knowledge. Excellent for informal knowledge-sharing throughout the organization.</td>
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**The Hidden Cost of Flexibility in E-Learning**

Although learner control can provide flexibility for employees, it also can come with a cost. Specifically, if organizations do not have a way of assessing e-learning, employees may “attend” the training, but not learn much. Managers and employees identify a common complaint about organizational expectations regarding e-learning. Many firms have developed broad online offerings and require employees to complete a series of courses in a given period of time. However, few employers allocate regular work hours to accomplish these tasks. For example, in hospitals, employees must keep many certifications current, and a significant amount of training must be delivered on a regular basis. After moving the majority of training online, the director of training for one multi-state hospital noted that employee use of e-learning spiked each evening at around 10:15 p.m. Further investigation revealed this was most employees’ only quiet time for completing the courses.

From a learning standpoint, the effectiveness of information delivered at the end of a long day is questionable. With this in mind, organizations should consider allocating specific work time for training. Whether employees remain on-site or are sent off-site, they need time to focus on the learning process.
to better learning outcomes, but the application of sound training design and learning principles.\textsuperscript{33} If employees find the technology doesn’t fit their preferred way of learning, they will engage less, find less value in it and be less satisfied with it.\textsuperscript{34} Organizations must apply sound, scientifically supported training principles to e-learning, just as with traditional, classroom-based training.

One of the most common problems with e-learning is the large attrition rate, with estimates as high as 70 percent.\textsuperscript{35} Typical reasons employees fail to finish e-training include feelings of isolation and lack of connection with the material. This is often the case if organizations simply replicate the content, slides and written material from a classroom setting without redesigning it for the web. A common mistake in converting to an online training environment is to design courses with little contact among learners. In a classroom setting, interpersonal contact is both frequent and common. Indeed, one of the benefits of a classroom setting is the opportunity to talk with peers, to network and to assist one another in the learning process.

Recent research shows that the more trainees communicate and feel connected with others while learning, the more they learn and the more likely they are to choose e-learning again in the future.\textsuperscript{36} To support connections, firms can use learning games, multimedia projects requiring trainee interaction and smaller chunks of learning that can be quickly shared. This can be especially effective for younger employees who are used to receiving information in rapid, short bursts via the web or on their phones.

Organizations should consider developing blended learning options in which a portion of the training is completed online and a portion in a classroom. For example, trainees can learn the basic concepts—such as leadership skills or person-to-person sales techniques—over the web. They then can be brought back together to discuss the results of their online work and to practice these techniques. Such a blended approach is extremely effective.\textsuperscript{37}

One of the major advantages of e-learning is that it can put learning in the hands of employees. By allowing increased learner control, trainees are able to modify the pacing, sequencing and timing of learning. Delivering information at the pace and in amounts best suited to the individual is very important to the amount of learning and retention that occurs. For example, Capital One provided employees with iPods as part of its e-learning initiative. Employees appreciated the flexibility of listening to training at their convenience and the increased access to programs they would not have been able to attend in person. This increased their motivation to learn.\textsuperscript{38}

**Potential Pitfalls in E-Learning**

As with other types of technology, the use of e-learning is not without its disadvantages.

**Not everyone is ready for e-learning.** If employees are not confident and experienced in their use of technology, their performance in an e-learning environment will
suffer. E-learning emphasizes that the employee is responsible for his or her own learning. Not all employees will have the discipline necessary to complete online coursework. Before implementing e-learning, organizations need to prepare employees not only in terms of technology, but also in terms of the differences to expect between traditional classroom learning and e-learning. Organizations may wish to consider running dual training tracks until employees can be fully transitioned to an online learning environment.

**E-learning can be isolating.** Organizations should recognize that e-learning is inherently isolating. Subject matter experts suggest that one of the biggest concerns is the lack of interaction among peers. Nearly all employees prefer to learn with others and perform better when part of a group. For example, Accenture reported that the lack of opportunity to communicate with peers made e-learning less attractive to its employees.39

**E-learning can reduce career-enhancing networking.** When training is conducted in a classroom, employees are able to engage with each other in the classroom and outside of it. These informal conversations and interactions can help employees broaden their personal networks and reinforce corporate culture. Such opportunities can be lost when a classroom course goes online. Organizations should implement new information-sharing technologies, such as wikis, chat rooms and topic-specific social media sites to help buffer this loss.

**Not all training should be online.** Although e-learning can be effective for explicit and fact-based knowledge, there is some concern about its effectiveness in training employees in soft skills, such as teamwork, leadership and interpersonal skills, which require trainees to interpret facial expressions, body language and other visual cues. The lack of visual cues available in an online environment would reduce training effectiveness. In those situations, some form of blended learning, in which basic information is learned online but practice is conducted in person, would improve effectiveness.

**E-learning does not mean simply putting existing materials online.** Well-designed online courseware is critical for success in e-learning. Organizations should resist simply taking the material in existing courses and putting it on the web. Training materials designed for a classroom setting do not necessarily work in an online setting. For example, a course dealing with health and safety may anticipate that certain equipment is available for practice and direct the learner to take certain actions. In the online version, it is unlikely the learner will have access to that equipment. An online version of that course might require high-resolution photographs, video demonstrations of equipment showing safe and unsafe actions, and 3-D visual models of the equipment the learner can manipulate. In the design of all e-learning, firms should ensure they incorporate the cognitive and motivational processes underlying sound training.
E-Performance Management

E-performance management uses technology to automate the collection of performance data, monitor employee work and support the development and delivery of performance appraisals. Organizations have many motivations for implementing e-performance management, including:

- **Improving access to performance data.** One of the challenges in most performance appraisal systems is the lag between work activities and performance feedback. With the availability of real-time data, managers can provide more timely feedback and employees can see a closer link between their behavior and their performance appraisals (PA).

- **Providing data that can make PAs more objective and valuable.** Automatic system capture of performance data can reduce the propensity of managers to focus on behaviors or attitudes unrelated to the job. In addition, when performance data can be collected by the HRIS and performance averages calculated, then, using pre-determined metrics and measures, a basic template of performance feedback can be generated for the employee. Managerial time can be spent on the “value added” portions of performance management, such as mentoring and coaching employees, rather than on collecting information and completing forms.

- **Reducing biases in appraisals.** A manager’s evaluations often are unduly influenced by his or her most recent observations of the employee. This can be mitigated by having performance data for the full evaluation period readily available for managers.

- **Linking performance information to other HR data,** such as individual developmental plans, compensation and bonuses, job assignments, and training opportunities.

Self-Assessment, Monitoring and Work Ethic in E-Performance Management

Unfortunately, there is relatively little published research on e-performance management. As noted above, e-performance management can provide workers with detailed descriptions of competencies to be included in the evaluation system. Managers and employees can view data on their performance on a regular basis, instead of only at the time of a performance appraisal. Although employees view this electronically captured performance feedback as more objective than feedback from a supervisor, they are likely to perceive the supervisor’s feedback as fairer. Individuals are less likely to distort negative information, and apt to be more accurate in providing feedback when the information is electronically communicated. However, when employees are asked to assess their own performance over a computer, there may be a risk that they inflate their performance levels more than if they were to assess their performance.
in person. Organizations need to understand these complex relationships and attempt to balance the various benefits and costs of using different approaches as they impact performance, accuracy and employee reactions. Even the best technology can’t fix a bad performance management process.

The major focus of research on e-performance management, though, has been on computer-based performance monitoring. Organizations use video and computer-based monitoring of employee behavior, such as keystrokes made, e-mails sent, websites visited, time to complete a customer service call and service time. It seems employees will work faster when electronically monitored—not only on monitored tasks, but also on nonmonitored tasks—but organizations should not assume monitoring is appropriate for all situations. For example, although performance monitoring does increase speed, this increase in speed may not work for complex tasks. Some hospitals have experimented with “smart” badges on nurses to closely monitor their speed of service and the time spent with each patient or procedure. Although these systems may sound appealing to administrators looking to increase productivity by rewarding speed, few patients are very pleased with having the fastest nurses.

It also is important to communicate the purpose of the monitoring and the fact that it will be used as a developmental tool rather than as a control mechanism. Employees will react more favorably and perceive the monitoring as fairer when its purpose is communicated and it is used developmentally. And, of course, employees who view the process as fair are more likely to demonstrate higher job performance, work satisfaction and commitment to the organization.

Finally, organizations should consider trying to identify candidates with a strong work ethic. Research has consistently found certain personality characteristics, such as conscientiousness, to be related to employee productivity and performance. Employees with a strong work ethic also are more likely to work effectively without substantial monitoring, so firms can avoid expensive monitoring systems, yet still have a productive workforce.

**Potential Pitfalls in E-Performance Management**

There certainly are some drawbacks to using e-performance management, and they should be given consideration.

**Production increases, but quality decreases.** Employees naturally tend to focus on behaviors that are rewarded. Although the intention of performance monitoring is to improve performance, a potential side effect is that other important, but unmeasured, work can suffer. For example, when employees are monitored on the speed of task completion, they likely will spend less time on non-performance-based criteria, such as customer service or quality.

**Best Practices: E-Performance Management**

✔ Design the system so that data can be captured and reviewed at multiple levels of detail, and so that employees can see relationships among measured behaviors, performance expectations and rewards.

✔ Work with employees to determine the types of data the system will capture. Capture data that help them be more effective in their jobs and update the data collected to support continued performance improvement.

✔ Remember that human beings are good at determining what is rewarded and what is not. When rewards are based on computer-captured metrics, behaviors that are not easily captured by the e-performance management system are apt to decrease.

✔ If data not captured by the e-performance management are important for performance appraisals, be careful that data collected by the system do not inadvertently become the sole source of the performance appraisal.

✔ The focus of a performance monitoring system should be on providing feedback to employees to enhance performance, not simply gathering information on them.

“Objectiveness” can outweigh importance. One of the tenets of e-performance management is that objectiveness of performance appraisals should increase with increased data capture. Unfortunately, while using such data, managers may miss, or fail to consider, non-objective measures, such as customer service. Once again, employees’ performance can become a reflection of the data the system collects. And employees are less likely to focus on more “subjective” behaviors if those are not being considered by managers.

Myopic focus. Often, a computer-based system encourages less effort by employees in decision-making, rather than taking advantage of computers for more effective decisions. Managers may rely on summary data, rather than fully participating in the appraisal process. In today’s time-pressed workplace, making sure computer-generated reports don’t replace managerial judgment and personal interaction is important.

Job complexity versus performance expectations. Computer-based performance management can help organizations benchmark performance expectations; can more accurately schedule employees for work-related activities such as service or repair calls; and can sometimes raise awareness about performance levels. But always remember that the time and expertise required for tasks varies greatly, and if the complexity of a task is not accounted for in the system, employees working on more complex tasks risk poor evaluations that do not accurately assess their skills and value.

E-COMPENSATION

One of the earliest areas of HR to be automated was compensation, and today, virtually all organizations use technology to automate payroll processes. Today’s e-compensation systems provide much more value than the simple automation of payroll processes. E-compensation uses web-enabled technology to help managers design, implement and administer compensation policies. An HRIS allows organizations to streamline and automate the compensation planning process, to model proposed changes in compensation plans, to track employee compensation history, to allocate incentive pay and bonuses, and to provide higher quality information to decision makers. A recent survey shows that 61 percent of organizations use e-compensation systems or plan to implement them in the next year.

Multiple business drivers support the growth of e-compensation technology:

- Pressure to contain labor costs. E-compensation systems can help increase access to both internal and external salary and compensation information. Data can then be incorporated into sophisticated compensation models and metrics, which can help managers better plan and model the costs associated with various incentive programs. Through better access to information and better compensation models, organizations are able to gain tighter control over compensation costs.

- Increasing employee knowledge of external market salary data. Perceptions of unfairness or inequity in pay will negatively
impact productivity and morale. Because employees now have easy access to web-based salary information, they are better informed as to how their salaries fit within the local marketplace. This knowledge may serve as a stimulus for the organization to keep its compensation structure up-to-date and internally equitable.

- **More rapid identification of inadequate pay structures.** Organizations can quickly take action to modify compensation packages, in order to attract high potential applicants and retain top performers.

Organizations are increasingly using technology to link their compensation systems with other components of their HRIS, such as performance management systems, training systems and succession planning. By tying information in the compensation plan to a range of HR practices and organizational data, the company can demonstrate the contribution of its compensation strategy to organizational success.

As noted above, one of the most important aspects of any pay or compensation system is the employees’ perception of the fairness of the system. Employees want to be fairly compensated for the value of the work they complete, as well as in relation to others in the organization (internal equity). They also want to be fairly compensated in relation to others in the marketplace (external equity). An HRIS can help organizations develop a compensation strategy that supports perceptions of fairness, both internally and externally. Some things to keep in mind related to fairness:

- **Internal equity.** The goal of internal equity is to ensure that pay for each job reflects the complexity and value of that job in the organization. Thus, e-compensation systems should link to job evaluations. Organizations want employee pay to reflect the value of the work to the firm, both from a managerial and a legal point of view. E-compensation applications can help compensation managers score or value work to enable them to set pay rates that are equitable within the organization’s compensation structure. A comprehensive e-compensation application can help managers collect and document the rationale for pay differences.

- **External equity.** What about the local labor market? For large cities, where the marginal cost of switching employees is somewhat small, this becomes important. Organizations unable to develop effective compensation plans will be at a disadvantage in the marketplace. An HRIS can help by summarizing data from external salary sources and using that data to inform the salary planning process. This can help ensure that top employees are being adequately compensated and thereby less apt to be lured away by competitors.

- **Individual equity.** Employees want to know they are being compensated fairly relative
to others in the same job in the organization. E-compensation systems give managers the tools to model different compensation structures and to assess the costs and the fit with employee performance data of various pay structures. For example, will a proposed bonus or raise place an individual out of the pay range for his or her position? Managers can use all this information to help them award raises and bonuses consistent with the desired pay structure of the firm. Managers can integrate performance data, internal salary data and external data to make compensation decisions more effectively and thus ensure salary increases will be based on performance.

Streamlining, Performance and Sharing Information in E-Compensation

The collected body of research on e-compensation reveals a few valuable conclusions:

- **E-compensation streamlines the salary planning process, reducing both time and costs.** Dell was able to reduce time spent on the salary planning process by nearly 65 percent (eight weeks to three weeks). Another company reported that its salary survey process was reduced from six months to six weeks. In addition, a major financial services company was able achieve more than $10 million in savings by implementing e-compensation.

- **Organizations with e-compensation systems outperform those without them.** A recent survey found that companies with e-compensation systems achieved an average of 10.1-percent sales growth, versus 8.8-percent growth for companies that did not have such systems.

- **Organizations should use the HRIS to share compensation information with their employees.** Companies sharing details about compensation with their employees are higher performing than those that do not. Companies often suffer from the illusion that pay information is secret, but in most cases, very little about pay decisions and levels remains truly confidential. Transparency in compensation plans and policies can lead to increased employee trust and confidence that the employer truly values and rewards performance. E-compensation applications can help organizations share this information with employees in an efficient and cost-effective manner.

- **The e-performance management system should be integrated with the e-compensation system.** Data regarding performance can seamlessly flow to the compensation system for use by managers as they make compensation decisions. Organizations linking these functions together effectively in an HRIS are able to achieve more than three times better sales growth than organizations simply focusing on the automation of HR transactions.

Potential Pitfalls in E-Compensation

E-compensation is only as good as the data stored in the system. One of the major challenges for organizations designing an e-compensation system is
accessing the most current information about employee salaries and current data on the external market. Externally, many salary surveys can be dated by as much as one to two years. Internally, it is often time-consuming to track and capture salary information for all individuals in the company. This reinforces the importance of ensuring that the e-compensation solution is able to access, collect and summarize the latest wage and benefits data for both internal and external labor markets.

**Substituting technology for judgment.** Compensation is as much art as science. HR technology can provide a useful tool for supporting compensation decisions, but the information provided should be considered advisory to managers. Systems can reduce the computational burden for managers and provide comparative data to aid decision-making, but managers still need to make the final judgment and often need to include factors not necessarily captured by the compensation system. A manager might be aware that an employee is at risk of leaving for a competitor and may use discretion to award a pay raise beyond that recommended by the system. Blind compliance with compensation software is an abdication of the role of the manager and ineffective for the firm in the long run.

**Letting the system or vendor determine your compensation strategy.** Any compensation system is based on assumptions about what is valued by the organization. These factors and the weight placed on them are vital HR strategy decisions. The mix and type of incentives must fit the organization’s business model.

When implementing a compensation system, make sure the vendor’s product supports your firm’s compensation strategy and is flexible enough to reflect the organization’s values and approach to incentive compensation.

**E-BENEFITS**

Benefits are a growing and expensive component of every employee’s total compensation. A recent government survey suggests benefits costs now average 43.6 percent of wages and salaries. Given the continued growth in the expense associated with health care and pension plans, the costs of employee benefits likely will continue to grow as well. In addition, with the coming implementation of the new Patient Protection and Affordable Care Act, reporting requirements also will grow. An e-benefits approach uses the web to communicate information on benefits to employees and allows them to elect and manage their benefits online. A recent survey suggests nearly all organizations are using technology to support benefits administration. Motivations for using e-benefits include:

- Reducing the costs for delivering benefits.
- Improving employee access to benefits information.
- Streamlining benefits administration.
- Empowering employees to manage their own benefits.

Although there are multiple ways that an organization can pursue an e-benefits approach, underlying each of these is the use of employee self-service (ESS). Most organizations now make benefits information
available via the HR portal, providing details ranging from health benefits to pension contributions and planning calculators, EAP program offerings, educational benefits, leave information, vacation scheduling, and many others.

**Outsourcing, Timeliness and Employee Management of E-Benefits**

Implementing e-benefits does not mean simply replicating paper-based forms online. Employees will only access the website when they need information, so the website should provide employees the information they need as quickly and clearly as possible. If employees are unable to find the information in a timely manner, they are likely to call the HR department. When this occurs, the goal of reducing the time and expense associated with benefits administration will not be achieved.

The most effective e-benefits websites are organized by life events such as marriage, birth and death, or by changes in work status, such as layoff and promotion.

Many organizations now link or outsource many of their benefits information support. For example, financial services organizations provide their clients’ employees with financial literacy information, allowing them to forecast the financial implications of their decisions, and encourage them to learn more about how to manage their 401(k). Many health care insurers provide online services to customers, allowing employees to learn about healthy eating, exercise and health management practices. Employees are empowered and encouraged to take more responsibility for their financial and physical well-being.

The importance of timely information increases dramatically when benefits go online. Indeed, if an employee makes a decision based on inaccurate information from the employer’s website, the employer may be held legally liable. If timely and accurate information is not available via the website, employees will be less likely to use it and will continue to call HR for assistance.

It is now a best practice to push the management of benefits to employees. By using employee self-service (ESS), organizations encourage employees to sign up for benefits online and manage their profiles and benefits online. Each vendor’s website should accurately reflect your firm’s policies, and organizations also should ensure their systems interface seamlessly with vendor systems to ensure information accuracy and user-friendliness.

HR professionals make intensive use of e-benefits systems for a variety of activities, such as controlling workers’ compensation costs or monitoring unemployment claims for ineligible former employees. Managers responsible for compliance with legal mandates (such as COBRA or the Family and Medical Leave Act) use systems to monitor employee status, payment and eligibility for health care benefits. Many mandated benefits programs carry significant financial penalties for noncompliance. E-benefits applications often can have a positive ROI in a relatively short time, not only by reducing transaction costs, but also by avoiding fines and penalties.
Potential Pitfalls in E-Benefits

Websites cannot replace skilled staff members. There is a temptation for HR policy makers to view the website as a way to reduce or eliminate HR personnel from all aspects of benefits administration. The HRIS can automate basic transactions, educate employees and create efficiencies in benefits administration. At the same time, the HRIS is not as effective in dealing with the inevitable exceptions to policy for which HR experts will need to be available. Consider the spouse who is inquiring about the benefits due him or her after a death, or about the company’s options for accommodating someone with a disability. Systems are not good at being empathetic, and a website can never completely replace a skilled HR professional.

An organization cannot depend exclusively on the website to communicate complex benefits information. The benefits website can be a rich source of information for employees, but it should not be the only source. Benefits are more complicated today than ever before, and pending changes in health care and pension benefits will only make the potential for confusion worse. Employees may not be able to make sense of choices and rules from the website and may need to speak with benefits experts to assist them in understanding the choices they will face.

THE FUTURE: FIVE-YEAR TRENDS IN HR TECHNOLOGY

Although the HRIS concept already has transformed the field of HR, technological changes on the horizon have the potential for even greater impact. Such trends include:

• Growth of social networking. One of the next challenges for HR executives is learning to integrate information from social networking sites. Potential benefits must be balanced with issues of privacy and data accuracy. Vital questions at this point include how to use social networking data to support recruiting, internal communications, employee knowledge sharing, collaboration and training. This area will evolve as legislation and applications develop. For example, German politicians already have proposed outlawing the use of social networking information in employment decision-making.

• Continued growth of compliance and reporting requirements. Organizations continue to be affected by state and federal compliance requirements, 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 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.

• Rent-versus-buy decisions. Although early adopters of HR technology often purchased hardware and software licenses from vendors, the growth of the Internet and web-based systems has enabled organizations to consider other approaches, such as cloud computing and software-as-a-service. The use of hosted approaches, in which organizations rent services and software from vendors, is growing. As cloud computing delivers more HR applications over the web, rent-versus-buy decisions will become more common. Such approaches can provide benefits, especially for smaller organizations that cannot afford to purchase a large system. Services such as cloud computing and software-as-a-service will grow in market share and will provide added flexibility to organizations’ HRIS strategies.

• Use of business intelligence (BI) and dashboards. How can firms measure HR’s contributions to profits? Although organizations already have invested in basic reporting capabilities and are establishing data warehouses, it has been a challenge to get these data into a form usable for managers. To address this problem, organizations will begin to use more sophisticated BI applications.
to make effective use of the large amount of data available through the HRIS. HR dashboards, which present high-level, real-time, graphically formatted data to managers, will become an integral part of the management of human resources. In addition, organizations will adopt more sophisticated web-based workforce analytic tools and will push data further out to managers. All this will help managers use their firms’ personnel policies and practices to make better decisions.

- **Changes in HR staff skills.** New types of HR professionals will be needed in the next few years. Some will continue to transition from transaction-based generalists to internal consultants who can help align HR practices with business goals. HR generalists also will need increased skills in change management and business process management. Another continually evolving role is that of the HR content expert. Legal requirements and other regulations make many benefits programs and HR policies much more complex to manage. As a result, organizations will need more staff who are experts in these new, complex regulations. Finally, HRIS skills will become more important for all HR professionals. Organizations will need HR staff members who can work effectively with external vendors and consultants to implement and upgrade software and evaluate implications of new software initiatives on the HR practices of the firm.

- **Increasing HR data transparency and increasing privacy concerns.** As noted above, an 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. Every few days, we see reports of data compromises and identity theft. 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.

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**May My Avatar Speak with Your Avatar?**

Second Life is a virtual world where avatars (digital representations of individuals) interact, learn and engage in many of the activities possible in the “real” world. For example, avatars can have conversations, start businesses and engage in hobbies. Corporations ranging from Accenture to IBM, HP and even the IRS have developed “islands,” or locations, in Second Life, for job seekers to visit and learn about career opportunities.

Much of what is contained on a traditional recruiting website can be designed into an organization’s Second Life recruiting environment. One major innovation with Second Life is that once on the island, the applicant’s avatar can interact with a recruiter’s avatar and receive answers to standard questions from a pre-determined list of responses. If the recruiter is online, the two can engage in an avatar-to-avatar conversation. Cutting-edge technologies such as Second Life are increasingly being used by organizations for recruiting, onboarding and sharing expertise among employees.
CONCLUSION

Human resource information systems have dramatically altered how HR services are delivered and managed by organizations. Used effectively, HRIS can make HR staff more efficient, better informed and better able to communicate how they add value to the business. As the research shows, organizations that combine effective HR management processes with effective HR technology are likely to be more productive and more profitable than those that do not. Of course, the challenge for HR executives is to manage this technology to maximize the benefits while minimizing the pitfalls along the way.

Best Practices:
Optimizing Your Results When Implementing HRIS in E-HR

✔ Redesign and streamline HR processes when implementing e-HR tools. Remember, e-HR is a powerful way to implement an HR strategy, but in and of itself, e-HR is not an HR strategy.

✔ Automate basic HR administrative tasks and use the HRIS to support managerial decision-making.

✔ Communicate with employees so they understand how and why e-HR data are being collected and used.

✔ Use data from the HRIS to ask more complex and strategic HR questions. Metrics matter, and the HRIS can offer powerful analytic tools to help managers make tough choices.

✔ Empower employees to control their own data via the HR website and delegate basic HR transactions to employees. Design the HR website to have timely information, make it easy to navigate and make it aesthetically pleasing. Make the HR web presence consistent with employees’ expectations. If employees can’t find what they need on the website, they will call HR.

✔ Balance technology with person-to-person contact. Don’t let technology manage the relationship with your employees. Losing a personal link with applicants and employees is a real risk with a strong e-HR strategy.

✔ Use non-technological solutions when appropriate. Though e-HR should be a central component of an organization’s HR strategy, it should not be the exclusive solution. Technology is not a replacement for sound HR strategy and strong employees.

✔ Remember that e-HR is not just for large organizations. Small and medium-sized businesses also can benefit from technological support of HR. As vendors continue to develop more solutions for such companies, opportunities will only grow.
Organizations that combine effective HR management processes with effective HR technology are likely to be more productive and more profitable than those that do not.
SOURCES AND SUGGESTED READINGS

BOOKS


This book was published as part of the Professional Practice Series by the Society for Industrial and Organizational Psychology. It is designed to assist practitioners in understanding how technology is changing the HR function. Topics include discussions of HR transformation, e-learning, e-selection, e-performance management, e-compensation, delivery trends, system acceptance and “long-term” technology trends as they impact the HR field.


This book is the latest version of the most widely used textbook on e-HR and is geared toward those with limited experience in HRIS. It covers topics such as determining software needs, managing the design and implementation process, use and acceptance of systems, and the impact of technology on the different functional areas of HR. This book is a good starting point in familiarizing HR staff members with the ways technology can enhance practice.


Volume 3 of this series focuses on the impacts of technology on organizations, especially the impact on human resources. Research essays cover topics such as the virtual workplace, the implementation of HRIS, e-compensation, the HR implications for virtual organizations and e-learning.
ARTICLES


The use of technology to support screening techniques can reduce the costs of implementing screening. This study focuses on fairness perceptions and organizational attractiveness across three screening technologies: face-to-face, telephone and interactive voice response (IVR). The results suggest there are no differences in applicant attraction and most perceptions of fairness, although those receiving IVR had lower perceptions of procedural justice.


Using the Internet to support recruiting is central to how organizations attract potential job candidates. In this article, Cappelli outlines four keys to effectively managing the e-recruiting process. These include using the web to attract candidates, using technology to sort applicants, issues of discrimination, and how to quickly identify and move to hire the top candidates.


In this study of 348 job seekers, the researchers examined the ability of applicants to customize the order of information viewed on a recruiting website. The results of this study provide evidence that the ability for applicants to customize information will lead to more accurate assessment of applicant fit with the organization and will reduce the number of poor fit applicants.


This paper discusses how technology changes in the field of HR are affecting the skills needed by HR employees. It focuses on how technology is reducing the need for the traditional HR generalist while increasing the need for specialists, including HRIS specialists and super content masters who can help employees navigate complex HR issues.


The use of more advanced technology can be viewed as a way for organizations to improve training outcomes. This article finds it may not be the technology itself that matters, but how the course design and technology fit with how the trainees like to learn. When the learners found a mismatch, they communicated less, were less engaged and performed slightly worse than when there was a fit.


This paper focuses on the relationship between applicant screening techniques and the use of performance monitoring. Specifically, the authors find that employers who screen applicants for factors such as conscientiousness, which can predict work ethic, are able to use less expensive forms of monitoring systems.


Communication is an important component of the creation of successful e-learning courses. This study found that individuals who communicated more performed better and were more satisfied with the course. In addition, research shows it is important for learners to feel they are in a shared learning environment. The more learners felt they were in a shared learning environment the more satisfied they were with the course and the greater their utility judgments (i.e., the more they saw the value in the course).


The use of computerized in-basket tasks can reduce administration costs, improve realism and allow for more timely feedback. In this study, a cloning procedure is used to design a computerized version of a paper-pencil in-basket test. The results of this study indicated that the computerized in-basket test scores were similar to the paper-pencil task, suggesting that
well designed in-basket tests can be converted to computer-based tests.

Marler, J. H., Liang, X., & Dulebohn, J. H. (2006). Training and effective employee information technology use. *Journal of Management, 32*, 721-743. The research described in this study focused on the importance of training and organizational support when transitioning to a new technology. Ninety-four administrative employees were surveyed, and both the amount and quality of training received predicted use intentions. In addition, employees were more likely to use the software when they felt they had access to additional resources.

Potosky, D., & Bobko, P. (2004). Selection testing via the Internet: Practical considerations and exploratory empirical findings. *Personnel Psychology, 57*, 1003-1034. This study reviews the research in the area of Internet-based selection testing. Specifically, it focuses on issues of measurement equivalence of online versus paper-pencil administration. Practical advice for measurement equivalence, applicant responses and technology design issues also is offered.

Sitzmann, T., Kraiger, K., Stewart, D., & Wisher, R. (2006). The comparative effectiveness of web-based and classroom instruction: A meta-analysis. *Personnel Psychology, 59*, 623-664. This is a meta-analysis of 96 studies on the relative effectiveness of web-based instruction (WBI) versus classroom instruction. Results show that web-based instruction can be as effective as classroom instruction. The results also indicate it is not the technology that makes the difference in learning; it is the use of sound course design principles.

Weichmann, D., & Ryan, A. M. (2003). Reactions to computerized testing in selection contexts. *International Journal of Selection and Assessment, 11*, 215-229. This paper focuses on employee attitudes and reactions and performance on computerized tests. The results show reactions to the test did not differ between paper-pencil and computerized tests. Computer anxiety and experience did affect performance scores, suggesting organizations should consider the role anxiety and experience may play when implementing computerized or online testing.

Williamson, I. O., Lepak, D. P., & King, J. (2003). The effect of company recruitment website orientation on individuals’ perceptions of organizational attractiveness. *Journal of Vocational Behavior, 63*, 242-263. In a study of 252 potential job applicants, perceptions of websites with a recruiting versus screening orientation were investigated. The results of this research found the websites that were recruiting-oriented were viewed as more useful and were more attractive to potential applicants. These results suggest the importance of focusing on recruiting rather than screening employees.

Stone, E. F., & Stone, D. L. (1990). Privacy in organizations: Theoretical issues, research findings, and protection strategies. In G. Ferris & K. Rowland (Eds.), *Research in personnel and human resources management, Vol. 8*, (pp. 549-411). Greenwich, CT: JAI Press. With the increasing collection of employee data made possible through HRIS, issues of employee privacy will only grow in importance. This article outlines the basic issues of privacy in organizations and how organizations can deal with them. It is an excellent primer on privacy issues.

**BOOK CHAPTERS**


Marler, J. H., & Dulebohn, J. H. (2005). A model of employee self-service technology acceptance. *Research in Personnel and Human Resource Management, 24*, 139-182. One of the key questions facing organizations as they implement employee self-service is how to get employees to use the system. This research essay reviews the work on technology acceptance and adoption,
integrating ideas from over 15 years of research and presenting a model of the factors that will increase the likelihood that employees will use the ESS.


This chapter reviews the research on the utilization of e-recruiting in organizations. It presents advice for the design of the corporate recruiting website, how to manage the recruiting process, and the potential issues that organizations face when implementing e-recruiting.


This chapter introduces a model of the functional and dysfunctional consequences organizations may face when implementing HR technology. It is one of the most thorough chapters on the topic and covers the potential positive and negative impacts on the different functional areas of HR as well as the impacts on the organization as a whole and the employees in the organization.

WEB AND OTHER RESOURCES

IHRIM (www.ihrim.org).

IRHIM is an organization dedicated to the advancement of the field of human resource information systems. It offers a variety of services to members, such as white papers, research on HRIS implementations, an online social network and a certification program. In addition, members of IHRIM receive the Workforce Solutions Review, which focuses on research findings about the use of technology to support HR.

SHRM (www.shrm.org).

The SHRM website has a rich collection of information about the use of HR technology in organizations. From white papers to case studies to industry research, the SHRM website can answer many questions regarding the use of technology to support different functions. In addition, SHRM’s member publication, HR Magazine, provides a monthly column on HR technology.

HR Executive (www.HREOnline.com)

HR Executive is a well-respected publication that focuses on current issues in HRM. The publication has an ongoing focus on articles dealing with technology in HRM and also sponsors an annual technology conference and a number of webinars dealing with HR technology issues. Recent articles have focused on social networking/media, mobile computing and implementing software as a service.

ANNUAL SURVEYS AND WHITE PAPERS

Consulting firms can be a good source of information and survey results for information regarding the use of e-HR. For more than 10 years, CedarCrestone (www.CedarCrestone.com) has published an annual HR systems survey. The CedarCrestone HR Systems Survey is valuable in that it contains longitudinal data on HR technology that allows trends to be examined. Likewise, Towers Watson (www.Towerswatson.com) publishes a wide variety of HR research, including specialized studies dealing with HR technology issues. The Towers Watson 2010 HR Service Delivery Survey Report provides excellent insight into the views of HR executives on key HR issues and the use of technology to address these challenges. Mercer (www.Mercer.com) also publishes a variety of technology-related reports dealing with HR issues. The foregoing is not meant to be an exhaustive list of sources, but instead represents a good place to start your HR technology research.

REFERENCES

1 CedarCrestone 2009-2010 HR Systems Survey, 12th Annual Edition
2 Although an HRIS may contain paper-based components, the focus of this manuscript will be on systems that are computerized.
3 Ibid.
5 Ibid.


19 For more information on these issues, the reader is encouraged to read Potosky, D., & Bobko, P. (2004). Selection testing via the Internet: Practical considerations and exploratory empirical findings. *Personnel Psychology*, 57, 1003-1034.


Transforming HR Through Technology


37 Ibid.


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