

Association for Information Systems AIS Electronic Library (AISeL)

SAIS 2012 Proceedings

Southern (SAIS)

2012

Moving Beyond Automation: A Framework and Research Agenda Studying the Role of Information Systems in e-HR

Richard D. Johnson

University at Albany, SUNY, rjohnson@albany.edu

James Burleson

Clemson University, jburles@clemson.edu

Jason Bennett Thatcher

Clemson University, jthatch@clemson.edu

Follow this and additional works at: <http://aisel.aisnet.org/sais2012>

Recommended Citation

Johnson, Richard D.; Burleson, James; and Thatcher, Jason Bennett, "Moving Beyond Automation: A Framework and Research Agenda Studying the Role of Information Systems in e-HR" (2012). *SAIS 2012 Proceedings*. 21.
<http://aisel.aisnet.org/sais2012/21>

This material is brought to you by the Southern (SAIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in SAIS 2012 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

MOVING BEYOND AUTOMATION: A FRAMEWORK AND RESEARCH AGENDA STUDYING THE ROLE OF INFORMATION SYSTEMS IN E-HR

Richard D. Johnson
University at Albany, SUNY
rjohnson@albany.edu

James Burleson
Clemson University
jburles@clemson.edu

Jason Bennett Thatcher
Clemson University
jthatch@clemson.edu

ABSTRACT

Building on Zuboff's (1985) concepts of the "automating" and "informating" effects of information technology, this study develops a framework that identifies the major areas in which information technology (IT) has the potential to transform the practice and delivery of human resource (HR) management. The framework briefly outlines how a human resource information system (HRIS) assists in the automation of HR processes and supports better information gathering and decision making by managers and HR professionals. Then, using the recruiting function of human resources, the manuscript illustrates how this framework can be used to inform HRIS research and identify gaps in the HRIS literature. This study concludes with a discussion of research questions, which, if examined, will help inform researchers as they study the use of IT to support the firms' HR function.

Keywords

Human resource information systems, recruiting, e-HR, automate, informate

INTRODUCTION

Human Resources (HR) focuses on the acquisition, training, appraising, compensating of employees, and managing the various functions associated with the people issues in the organization (Dessler, 2012). Although HR functions such as payroll were some of the earliest organization functions to be automated, few researchers in the broad domain of information systems (IS) have focused on how IT has affected the HR function (DeSanctis 1986, George, 1996). Recently, a growing consensus has emerged among HR researchers that human resource information systems (HRIS) have the ability to not only automate HR processes, but to transform the HR function (Gueutal and Stone, 2005). HR processes are increasingly integrating IT and are rapidly reflecting an electronic human resources (e-HR) approach to HR service delivery. E-HR "uses information technology, particularly the Web, as the central component of delivering efficient and effective HR services" (Kavanagh, Thite, and Johnson, 2011, p. 18). Given this growth in the centrality of IT and e-HR within human resources, it is important to outline and focus on the broader issues associated with these changes.

Although there has been an increase in the focus on e-HR and HRIS by researchers, much of this research has been focused on specific issues within human resources such as recruiting website design (Dineen and Noe, 2009), online performance appraisals (Payne, Horner, Boswell, Schroeder and Stine-Cheyne, 2009), and computerization of selection tests (Schmitt, Gilliland, Landis, and Devine, 1993) and much of this research has been conducted by researchers outside of the IS field. In addition, although these studies have investigated HRIS design and use issues, their HR-specific focus and lack of clear linkage to IS research risks a lack of overall integration of research and themes across studies and the fields of IS and HR. This lack of cohesion suggests that the two fields would benefit from the development of a broader framework on the impacts of IT on the HR function. Further, much of the research is more broadly focused on human resources issues, with the IT playing a secondary role. Therefore, it is important for IS researchers to begin investigating the impacts of IT on HR. Therefore, this study introduces a framework for studying the use of HRIS in organizations. Due to the restrictions of a conference submission, this paper will only focus on the Recruiting and Selection functions of HR. A broader study is being conducted which will incorporate additional functions.

FRAMEWORK DEVELOPMENT

The framework is guided by several factors, such as the HR functions, the key tasks within these functions and the issues associated with the "informating" and "automating" HR functions with IT. According to Noe, Hollenbeck, Gerhart and Wright (2009) there are nine important functions that HR fulfills in organizations. Within each of these functions, there are

several tasks for which that function is responsible. For example, HR is responsible for the recruiting and selection of organizational employees. In addition, HR is responsible for helping managers ensure fair and equitable pay structures. Finally, unlike many other organization functions, information is needed to support the organization's compliance with local, state, and federal employment regulations so that HR can not only help the organization remain profitable, but also reduce legal exposure.

How then can an HRIS help organizations complete these tasks more efficiently and effectively? As Zuboff (1985) noted, there are many different reasons that organizations will utilize information technology. The first, and most simple, reason is to replace human effort or labor with technology. This continues to be of particular importance in human resources because the function has long been labor intensive, with as much as 70% of human resources time spent on conducting basic HR transactions (Wright and Dyer, 2000). The automation of these tasks has been shown to reduce costs by as much as 95% for some transactions (cf. Cober, Brown, Blumenthal, Doverspike and Levy, 2000). In addition, it has been argued that this automation is creating new opportunities for HR professionals to focus instead on other organizational tasks which are more strategic, complex, and value-added (Gueutal, Marler and Falbe, 2007).

Although cost savings from automation are substantial, the greatest potential value derived from an HRIS may lie in its ability to informate HR processes. Zuboff (1985) observed that when IT informates processes, it "increases the comprehensibility of the very processes that have been automated" (p. 8). Automation of HR functions creates opportunities for greater access to HR data and a greater understanding of how to more effectively deliver HR functionality. It is this "informating" potential of HRIS which brings the greatest opportunities for transforming HR.

However, for this transformation to succeed, researchers and developers need to develop an overall understanding of the roles and responsibilities of HR, how technology can support the automation of HR processes, and the ways in which HRIS can "informate" human resources. Understanding the automating and informating potential of an HRIS requires examining a series of research issues which include usability, implementation success factors, legal issues, changes to the HR practice, interface design, HR decision-making, and more. Table 1 summarizes the key tasks and functions of human resources, provides illustrative examples of how an HRIS can support the automating and informating of HR, and provides illustrative citations for each function discussed.

When reviewing this framework, it is important to keep in mind that the framework is meant to be a descriptive, organizing approach for studying HRIS rather than a parsimonious theory-driven model. The HR function is complex and focuses on a diverse set of issues associated with managing the firm's human capital. Because of this diversity in topics and outcomes, it is inappropriate to articulate a single overall theoretical model for studying HRIS. Instead, our framework serves as a guide for information systems researchers to help them better focus on the diverse areas in which the use of an HRIS may affect the practice of HR as well as to provide insight as to the theoretical bases upon which IS researchers can draw when studying HRIS.

ILLUSTRATING THE FRAMEWORK – RECRUITING

The main goal of recruiting is to attract the most qualified individuals and to motivate them to apply for open positions. Recruiting leverages IT in three ways: (1) using the Web as a means for reaching a broader pool of applicants, (2) as a tool for receiving and managing applications, and (3) as a channel for communicating the details of a vacant job position (Stone, Lukaszewski and Isenhour, 1995). Each of these uses of IT utilizes the automating and informating capabilities of IT. The remainder of this section will detail how the two objectives of the HR department operate within the framework of Zuboff's automate/informate structure.

Automate

In an effort to attract applicants, organizations have used IT to automate the recruitment process, including the collection and processing of applications. In addition, many organizations are using a corporate recruiting website as a major source of information for applicants. IT has increased the reach of organizations' recruitment programs and improved their ability to solicit applications from qualified job seekers throughout the globe. Whereas old communication channels such as newspaper listings and recruiting agency notifications reached a limited audience (e.g., geographic, subscribers, or clients), the use of the helps organizations reach a wider pool of job seekers (Cappelli, 2001). By increasing a job advertisement's reach, and by lowering barriers to applicants, organizations hope to reach a broader pool of qualified applicants. e-Recruiting and the "automation" of the recruitment process have allowed organizations to more effectively advertise positions while increasing their potential applicant pool (Cappelli, 2001; Cardy and Miller, 2003).

Figure 1. Framework for Studying Human Resource Information Systems

Function	Illustrative Activities	Automate	Informat	Illustrative Studies
Analysis and Design of Work	Job Analysis, Job Design	Electronic support for the creation, storage, and retrieval of Job Descriptions and Job Specifications	Development of keywords and skills which can automatically be linked to assessment of the current HR skill set, needs forecasting, job selection	Whitman and Hyde, 1978
Recruitment and Selection	Attracting and Recruiting Employees Interviewing, testing and making hiring decisions	Online resume submission, corporate recruiting website, Online testing and automated test scoring	Keyword scanning to match applicant skills to job requirements, calculation of yield ratios to improve recruiting efficiency	Cober et al., 2000; Dineen and Noe, 2009
Training and Development	Employee Orientation, Skills Training, Career development programs	e-learning, automatic recording of training scores	Assessing current employee skills and facilitating a plan for employee development	Salas, DeRouin, and Littrel, 2005; Johnson, Gueutal, and Falbe, 2009
Performance Management	Develop performance standards, monitor performance and conduct performance appraisals	Automatic collection of performance data, current monitoring of performance	Supports planning and goal setting for employees during each performance cycle	George, 1996; Payne et al., 2009
Compensation and Benefits	Wage and salary administration; Incentive plans, Healthcare and retirement plan administration	Online benefits enrollment, auto-deposit of retirement funds	Scenario Planning and “what-if” analysis for employees as they manage their retirement	Payton, 2003; Huang, Yang, Jin and Chiu, 2004
Employee Relations	Employee Attitude surveys; labor relations, outplacement and relocation services	Web-based administration of employee surveys	Assessing employee attitudes and better predict performance and turnover intentions	
Personnel Policies	Policy creation and communication; record keeping	Online Employee Handbooks, auto generated emails communicating changes to corporate policy	Assessing the performance implications of new HR policies	DeSanctis, 1986
Compliance with Laws	Policies to ensure lawful behavior; reporting; posting information; safety inspections; accessibility accommodations	Submission of EEO-1 Reports	Assessing and evaluating the success of diversity initiatives	Hogler, Henle and Bemus, 1998
Support for Strategy	HR planning and forecasting; change management	Employee Self-Service systems	Using HR Metrics and Balanced Scorecard to Make better use of human resources	Marler, Liang and Dulebohn, 2006

In addition, IT can help automate information exchange in labor markets. Labor markets are often thought of as being composed of dyadic relationships between job seekers and organizations and are characterized by information asymmetries. Job seekers want to know as much information as possible regarding open positions and hiring organizations want to know as much information as possible regarding the applicant. In conventional labor markets, preliminary information exchange involves job seekers and organizations presenting a limited description of their attributes to a limited audience. The organization posts rudimentary responsibilities and requirements, while the applicant submits a standard list of proficiencies (e.g., a resume) to a small set of organizations.

Automating this information exchange process has introduced new efficiencies to labor markets. For example, corporate recruiting websites and general purpose job boards such as Monster.com provide job seekers with greater capabilities to more efficiently seek and search basic organizational information and to find job openings that match their skill sets. Conversely, organizations are able to automatically comb through résumés in online databases for keywords that most closely match their requirements (Buckley, Minette, Joy and Michaels 2004; Galanaki, 2002). Essentially, the challenge for HR managers is how to incorporate IT into recruiting processes that can facilitate efficient information exchange.

Informate

These advances in automating capabilities have also increased HRs ability to “informate” recruitment processes. For example, prior communication processes limited the capability of organizations to effectively target job openings to a specific population of applicants. For example, an old media communication channel, such as a newspaper or trade magazine, would share advertising with any potential job seeker within a limited geographic area, regardless of skills, background, or fit. For large organizations, this geographic limitation necessitated the use of multiple postings in multiple locations and sources. However, with the plethora of online information channels and tools available today, organizations can not only more efficiently reach a broader audience, but they can also better understand the yield of applicants from each of these different sources. They can then use this information to exert greater control over the audience to which they will target their postings and the types of information presented in these postings (Dineen, Ling, Ash and DelVecchio, 2007; Lievens and Harris, 2003). For example, based upon past successful hires, an organization may target a narrow segment of software developers via a specialized job board or LinkedIn group. This specialized focus provides two major benefits. First, communication costs can decrease as fewer job posting locations may be required. Second, it increases the likelihood that a strong fit candidate may see the job posting and consider applying. In essence, IT is enabling organizations to ask richer questions about their applicants and the choices they make in the recruitment process.

In addition to better targeting a focused applicant group, HR departments can also leverage IT to more effectively provide information to interested job seekers. Whereas advertisements would traditionally list only limited job information and even less organization information, websites now have the capacity to provide rich information about a firm’s strategy, values, recruitment processes, and expectations of employees. Embedded in this information are implicit signals about what skills, values, and abilities, and other characteristics are valued by the organization. By providing this deeper information, firms enable applicants to gain greater understanding of potential employing organizations, enabling them to make more informed decisions about fit before applying for the job (Allen, Mahto and Otondo, 2007; Braddy, Meade and Kroustalis, 2008; Lyons and Marler, 2011). In addition, the ability of applicants to customize their web experience on a recruiting website has been shown to increase the likelihood that poor fit applicants will self-select out of the recruitment process (Dineen, et al., 2007). For applicants this means that they are able to make more informed and, hopefully, more effective decisions about job and organization fit before they decide to apply for a position. For organizations, this may mean a decreased volume of applications received and an increased probability that actual applicants may be a better fit with their culture and more likely to remain with the organization over time.

FUTURE DIRECTIONS

Although substantial advances have been made in automating HR recruitment processes, important opportunities exist for extending our understanding of how to better informate recruiting processes. For example, new research in media characteristics and communication suggests that recruitment channels that provide multiple communication forms to prospective applicants (e.g. text, video, audio, etc.) will improve pre-hire outcomes such as organizational attraction and intention to pursue employment with the firm (cf. Allen, Van Scotter and Otondo, 2004). Where extant research on website design and recruitment often focus on layout usability and navigability, there remain additional opportunities for examining how the richness in communication and website design affect applicants’ decision-making during recruiting as well as pre-hire outcomes.

There also are opportunities to consider how established models of e-commerce purchase intentions may translate to predicting pre-hire outcomes. It is possible that many of the same mechanisms underlying purchase decisions, such as trust,

privacy, and ease of use may also underlie the decisions to submit an application for a position. For example, perceptions of a firm's ability to protect personal information may affect an applicant's willingness to apply for a position. By investigating the mechanisms through which a recruiting website's design and communication features affect applicants' willingness to apply for a job, theories from information systems can better inform HR on how technical considerations (e.g. website design) can influence the effectiveness of the recruitment process.

At a higher level, there is a dearth of research on the actual physical design of recruitment websites and their impact on different categories of job seekers. For example, there may be differences between older and younger workers, men or women, or between those with different ethnicities with respect to their reactions to the design of the website. For example, prior research has found that older and younger users respond differently based upon the information structure on websites (Pak and McLaughlin, 2010). To the best of our knowledge, research has yet to examine information structure and its relative effectiveness for reaching different classes of applicants, or whether the information structure causes different groups to self-select out of the recruiting process. If information structure is causing certain groups to self-select out of the recruitment processes it will reduce organization diversity and may leave the firm liable to a lawsuit.

To address this topic, there is a need for research that focuses on how information structure can affect recruitment outcomes. For example, research could examine whether employing a hierarchical versus tagging website structure leads applicants to more or less quickly identify desirable jobs (Pak, Price, and Thatcher, 2009). Alternately, research could examine whether the structure of an online application, and the information elicited in the application process affects the likelihood that different categories of job seekers will be attracted to the organization or will apply. Simply put, we do not fully understand the implications of website design for communicating with and attracting a diverse group of job seekers. Through this research, we can provide organizations with the knowledge necessary to better informate the recruitment process for both applicants and organizations.

LIMITATIONS

Due to the length limitations of a conference submission, we have not attempted to discuss all of the areas of HR, the types of systems supporting each area and the research issues associated with each. Instead, we have exclusively focused on the "Recruiting and Selection" portion of the framework outlined above, and within this category, we have chosen to focus on recruiting because of its stronger and richer research tradition. In the future we plan to examine these other areas of HR and how the informing and automating capabilities of HRIS may affect key outcomes in these areas.

CONCLUSION

As can be seen from the example above, HR is increasingly being transformed by the use of HRIS. Advancements in technology such as web-based recruiting have brought with it a deeper need for information (e.g. informing) as well as reduced transaction costs (e.g. automating). Because of these advances in technology, HR functionality is increasingly becoming e-HR enabled, allowing organizations to rethink how they deliver this functionality and even whether to keep HR in-house or outsourced. Corporate strategy continually evolves and recent advances in technology such as cloud computing will only increase the opportunities for HR to adjust the delivery of HR functionality. In addition, increasing data storage and more sophisticated decision-tools can provide ever increasing data to HR professionals and managers. This rapid evolution of HR and its relationship to technology have not come with a commensurate research focus. It becomes important for researchers from multiple fields such as information systems, human resources, and I/O psychology to work together to more deeply investigate the issues associated with the use of HRIS in organizations and the evolution of the delivery of HR functionality to an e-HR mechanism. We believe that the field of information systems is uniquely qualified to contribute to this literature and hope that the articulated framework will help the field begin to gain interest in this valuable and rich area of research.

REFERENCES

1. Allen, D. G., Mahto, R. V., and Otondo, R. F. (2007) Web-based recruitment: Effects of information, organizational brand, and attitudes toward a web site on applicant attraction, *Journal of Applied Psychology*, 92, 1696-1708.
2. Allen, D.G., Van Scotter, J.R., and Otondo, R.F. (2004) Recruitment communication media: Impact on prehire outcomes, *Journal of Applied Psychology*, 57, 143-171.
3. Braddy, P. W., Meade, A. W., and Kroustalis, C. M. (2008) Online recruiting: The effects of organizational familiarity, website usability, and website attractiveness on viewers' impressions of organizations, *Computers in Human Behavior*, 24, 2992-3001.
4. Buckley, P., Minette, K., Joy, D., and Michaels, J. (2004) The use of an automated employment recruiting and screening system temporary professional employees: A case study, *Human Resource Management*, 43(2&3), 231-241.

5. Cappelli, P. (2001) Making the most of on-line recruiting, *Harvard Business Review*, 79, 139-146.
6. Cardy, R.L. and Miller, J.S. (2003) Technology: Implications for HRM. In D.L. Stone (Ed), *Advances in Human Performance and Cognitive Engineering Research* (p. 99-118), Greenwich, Ct: JAI Press.
7. Cober, R. T., Brown, D.J., Blumental, A.J., Doverspike, D., and Levy, P. (2000) The quest for the qualified job surfer: It's time the public sector catches the wave, *Public Personnel Management* 29, 479-496.
8. DeSanctis, G. (1986) Human resource information systems: A current assessment, *MIS Quarterly*, 10(2), 15-27.
9. Dessler, G. (2012) *Fundamentals of Human Resource Management*, 2nd Ed. Prentice Hall: Upper Saddle River, NJ.
10. Dineen, B.R., Ling, J., Ash, S.R., and DelVecchio, D. (2007) Aesthetic properties and message customization: Navigating the dark side of web recruitment, *Journal of Applied Psychology*, 92, 356-372.
11. Dineen, B.R. and Noe, R.A. (2009) Effects of customization on application decisions and applicant pool characteristics in a web-based recruitment context, *Journal of Applied Psychology*, 94, 224-234.
12. Galanki, E. (2002) The decision to recruit online: A descriptive study, *Career Development International*, 7(4), 243-251.
13. George, J. (1996) Computer-based monitoring: Common perceptions and empirical results, *MIS Quarterly*, 20, 459-480.
14. Gueutal, H.G., Marler, J.H., and Falbe, C.M. (2007) Skill sets for the e-HR world, *IHRIM Journal*, 11(2), 9-15.
15. Gueutal, H.G., and Stone, D. L. (Eds.) (2005) *The Brave New World of eHR: Human Resources Management in the Digital Age*. San Francisco, CA: Jossey-Bass.
16. Hogler, R. L., Henle, C. and Bemus, C. (1998) Internet recruiting and employment discrimination: A legal perspective, *Human Resource Management Review* 8(2), 149-164.
17. Huang, J. H., Yang, C., Jin, B.-H. and Chiu, H. (2004) Measuring satisfaction with business-to-employee systems, *Computers in Human Behavior*, 20, 17-35.
18. Johnson, R. D., Gueutal, H. and Falbe, C.M.. (2009) Technology, trainees, metacognitive activity and e-learning effectiveness, *Journal of Managerial Psychology*, 24, 545-566.
19. Kavanagh, M.J., Thite, M. and Johnson, R.D. (2011) *Human Resource Information Systems: Basics, Applications, and Future Directions*. Thousand Oaks, CA: SAGE Publications.
20. Lievens, F. and Harris, M.M. (2003) Research on internet recruiting and testing: Current status and future directions, In C.L. Cooper and I.T. Robertson (Eds). *International Review of Industrial and Organizational Psychology*, 18, West Sussex, UK: John Wiley and Sons
21. Lyons, B. D., and Marler, J. H. (2011) Got image? Examining organizational image in web recruitment, *Journal of Managerial Psychology* 26, 58-76.
22. Noe, R.A., Hollenbeck, J.R., Gerhart, B. and Wright, P.M. (2009) *Fundamentals of Human Resource Management*, 3rd Ed. New York: McGraw-Hill Irwin
23. Marler, J. H., Liang, X. and Dulebohn, J. H. (2006) Training and effective employee information technology use, *Journal of Management* 32, 721-743.
24. Pak, R. and McLaughlin, A.C. (2010) *Designing displays for older adults*. Boca Raton: CRC Press.
25. Pak, R., Price, M.M., and Thatcher, J.B. (2009) Age sensitive design of online health information, *Journal of Medical Internet Research*.
26. Payne, S.C., Horner, M.T., Boswell, W.R., Schroeder, A.N., and Stine-Cheyne, K.J. (2009) Comparison of online and traditional performance appraisal systems, *Journal of Managerial Psychology*, 24, 526-544.
27. Payton, F. C. (2003) E-health models leading to business-to-employee commerce in the human resources function, *Journal of Organizational Computing and Electronic Commerce*, 13, 147-161.
28. Salas, E., DeRouin, R. and Littrell, L. (2005) Research based guidelines for designing distance learning: What we know so far, In Gueutal, H.G. and Stone, D.L. (Eds). *The Brave New World of e-HR* (pp. 104-137). Jossey-Bass, San Francisco, 104-137.
29. Schmitt, N., Gilliland, S.W., Landis, R.S., and Devine, D. (1993) Computer-based testing applied to selection of secretarial applicants, *Personnel Psychology*, 46, 149-165.

30. Stone, D. L., Lukaszewski, K., and Isenhour, L. (2005) e-Recruiting: Online strategies for attracting talent. In H. G. Gueutal and D. L. Stone (Eds.) *The Brave New World of eHR: Human Resources Management in the Digital Age* (pp. 54-103). San Francisco
31. Zuboff, S. (1985) Automate/informate: The two faces of intelligent technology, *Organizational Dynamics*, 14(2), 5-18.
32. Whitman, T. S., and Hyde, A.C. (1978) HRIS: Systematically matching the right person to the right position, *Defense Management Journal* 14(2), 28-34.
33. Wright, P.M. and Dyer, L. (2000) People in e-business: New challenges, solutions, Ithaca NY: CAHRS Working Paper Series, Cornell University.