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Introduction to Special Issue

The Importance of the Interface between Humans and Computers on the Effectiveness of eHRM

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Abstract:

Technology has had a dramatic impact on the practice of human resources, and its impact is rapidly increasing. Even so, little research has examined how to apply information systems and human-computer interaction principles to designing human resource information systems. In this paper, we focus more closely on the role that the interface between the computer and human play in the success of electronic human resource management. Specifically, we a) briefly review the individual requirements of several eHRM functions (e.g., e-recruiting, e-selection, e-learning, e-compensation/benefits), b) consider how an understanding of human computer interaction can facilitate the success of these systems, c) reviews research on technical issues associated with eHRM, and d) highlight how applying HCI principles can increase their effectiveness. In addition, we introduce the remaining seven papers in the special issue.

Keywords: Human Resources, Information Systems, Human Resource Information Systems, Human-computer Interaction, Electronic Human Resource Management.

1 Introduction

The success of electronic human resource management (eHRM) depends largely on effective interactions between people and computers primarily because eHRM requires that applicants, employees, and managers use computers for HR-related tasks such as applying for jobs, completing employment tests, attending online training, or modifying their benefits (Gueutal & Stone, 2005). The nature of a user interface and the user interactions with the interface has the potential to impact human resources (HR) and organizational outcomes. Therefore, the eHRM field can benefit greatly from understanding human computer interaction design principles.

In our first introduction to the special issue on human resource information systems (HRIS) and human computer interaction (HCI), we briefly summarized the history of the HRIS field, the key issues researchers have investigated, and HCI's in the study of eHRM. In addition, we introduced the first two papers in this special issue. In this paper, we focus more specifically on the importance of the interface between humans and computers to the success of eHRM. To do so, we review the individual requirements of several eHRM functions (e.g., e-recruiting, e-selection, e-learning, e-compensation/benefits) and consider how understanding human computer interaction can facilitate the implementation and success of these systems. In addition, we briefly review research on technical issues associated with eHRM and highlight how applying HCI principles can increase their effectiveness. Finally, we introduce the remaining seven papers in this special issue.

2 Integrating HCI Principles with eHRM

Because most medium-sized and large organizations have adopted a HRIS, the last two decades have seen a dramatic shift in how central technology is to HR practices (e.g., Kavanagh, Thite, & Johnson, 2015; Strohmeier, 2007; Stone, Deadrick, Lukaszewski, & Johnson, 2015). With eHRM, delivering HR services and functionality "connects employees, applicants, managers, and the decisions they make" through information technology (Johnson, Lukaszewski, & Stone, 2016a, p. 536). In other words, technology, specifically a HRIS, is central to how organizations deploy and deliver HR functionality and how they manage people. As we noted in our first introduction, much of the research on HRIS/eHRM has appeared in the management, human resources, and industrial/organizational psychology literature (Johnson, Lukaszewski, & Stone, 2016b) and often not focused on how technology design and HCI issues may affect HR outcomes. Therefore, this special issue, we bring together scholars interested in HCI and eHRM and who conduct research that spans the domains of HCI, information systems, and HRIS. In the following sections, we briefly review eHRM research in the areas of recruitment, selection, training, and employee benefits. We pay particular attention to where theories from information systems and HCI can inform eHRM research.

2.1 E-recruitment

Researchers have defined e-recruiting as using websites, Web portals, or kiosks to attract applicants and enable them to apply for jobs online (Braddy, Meade, & Kroustalis, 2006; Dineen & Noe, 2009). E-recruiting requires that applicants be able to use a computer or mobile device (e.g., tablet, smartphone) to locate and navigate websites to learn about job and organizational opportunities and to upload a resume or complete an online job application once on the website. Research has found that e-recruiting can dramatically reduce recruiting cycles and costs (Cober, Brown, Blumenthal, Doverspike, & Levy, 2000). However, beyond improving efficiency, e-recruiting can also help improve recruiting outcomes such as applicants' perception of the firm and their intention to apply for a position with the firm (Allen, Mahto, & Otondo, 2007).

Organizations face important interface design considerations when implementing e-recruiting. For example, research has found that the design of the recruitment interface (e.g., aesthetic appeal, navigability, ease of use, customizable experience) can improve applicant perceptions of firms and their intention to apply for a position with them (Chapman, Uggerslev, Carroll, Piasentin, & Jones, 2005; Cober, Brown, Levy, Cober & Keeping, 2003; Zusman & Landis, 2002). Beyond these initial findings, we believe that a richer understanding of HCI and interface design can further improve e-recruiting outcomes. For example, as we move to more mobile recruiting, researchers should more fully investigate how applicant's perceptions of ease of use, navigability, and aesthetics change depending on the device used and the relative importance of each for recruitment outcomes such as how well they attract applications or enhance their intention to apply.

In addition, recruitment websites can be an important way for applicants to determine their organizational fit. Person-organization fit is important because it can affect employee satisfaction, commitment, turnover, and performance (Kristof-Brown, Zimmerman, & Johnson, 2005). A more effectively designed website can help potential applicants better determine fit and can reduce the number of poor-fitting applicants that an organization needs to consider (Dineen & Noe, 2009). But, research in this area has yet to systematically apply HCI principles to improve their design and encourage better-fitting applicants to apply. For example, one can apply HCI principles to using games and virtual or augmented reality to help improve recruiting outcomes. In addition, findings on recommendation agents (Komiak & Benbasat, 2006) from consumer websites could also provide insights for better customization and personalization in e-recruiting website design.

2.2 E-selection

Selection represents a second area where technology has long played a role in eHRM. E-selection systems gather job applicants' knowledge, skills, and abilities (KSAs) using various forms of tests (e.g., application blanks, personality inventories, cognitive ability tests, and interviews), and they help organizations select the most qualified person for a job (Stone, Lukaszewski, Stone-Romero, & Johnson, 2013). With the increasing use of technology, applications need to be able to use the computer or Internet to complete cognitive ability tests, personality inventories, biodata form, and to participate in electronic interviews (Kehoe, Dickter, Russell, & Sacco, 2005; Stone et al., 2013). In addition, the technology should not lead to differential inferences about applicants based on technology skill or comfort that are unrelated to the selection task. Specifically, Anderson (2003) identifies two questions organizations should ask when considering using technology in selection that HCI research can inform. First, are paper-and-pencil (PP) tests equivalent to electronic tests? Second, are applicant reactions the same for PP and computer-based tests?

In regards to the first question, a large amount of research has concentrated on the degree to which computerized tests are equivalent to PP tests. The results suggest that that there are differences in the effectiveness of computerized and PP cognitive ability tests, personality inventories, and situational judgment tests (Stone et al, 2013). Stone et al. also argue that one reason for these differences is that applicants must contend with both the task of using the computer and the selection task simultaneously. As a result, it may not be clear if scores on employment tests are a function of applicants' cognitive abilities or their computer abilities or anxiety.

Research on e-selection has also examined the effectiveness of electronic employment interviews. Employment interviews allow one to collect information about such variables as the communication and interpersonal skills of applicants, but face-to-face interviews are time consuming and costly. As a result, organizations are now using videoconferencing and interactive voice-response systems to conduct interviews (Chapman & Rowe, 2002). Although there may be several advantages associated with using technology to interview applicants, research results show that the type of technology used may influence the evaluation of the candidate and their reaction to the interview (e.g., Chapman & Rowe, 2002; Chapman, Uggerslev, & Webster, 2003; Straus, Miles, & Levesque, 2001). Specifically, these studies have found that individuals interviewed over videoconferencing are rated lower than those interviewed in person. In addition, applicants have more negative reactions to videoconferencing interviews.

We believe that HCI design principles can help improve both the equivalence of these tests and applicants' reactions to them. For example, previous research has found that reading from hard copy text is faster than reading from a screen (Ziefle, 1998). In addition, the nature of mobile phones and tablets suggests that their interface capabilities and limitations may affect applicant completion speed and accuracy that is unrelated to an applicant's actual abilities. Therefore, HCI research can help one design interfaces that may reduce differences between PP and computer-based tests. Theories such as media synchronicity theory (Dennis, Fuller, & Valacich, 2008) and task-technology fit (Goodhue & Thompson, 1995) could also further our understanding of how social cues in technology-enabled interviews may affect an applicant's reaction to them and how decision makers evaluate that applicant. Finally, researchers can apply HCI techniques and theories to improve the fidelity and realism of assessment centers through games and virtual reality (Lievens & Thornton, 2005; Aguinis, Henle, & Beatty, 2001).

2.3 E-learning

Organizations now use a variety of technologies to deliver training to employees. These e-learning processes range from merely providing training materials online to using a variety of more advanced technologies to deliver course content and support trainees' involvement in the learning process (Johnson & Brown, 2017). Although early researchers suggested that e-learning may be inferior to face-to-face (FtF) learning, meta-analytic research has found that well designed Web-based training can be as effective as FtF training (Sitzman, Kraiger, Stewart, & Wisher, 2006). However, it is not as simple as replicating a classroom setting online. Instead, designers must consider students' characteristics, instructors' characteristics, communication, learner control, and technology design (Johnson & Brown, 2017).

Of particular interest to the special issue is how technology design may affect e-learning outcomes. For instance, when systems are complex and challenging to use, training performance can suffer (Alavi, Marakas, & Yoo, 2002). Conversely, when learners perceive that the technology supports their preferred learning style, they may have better learning outcomes (Hornik, Johnson, &Wu, 2007), which suggests that the type of technology used and its design can influence learning outcomes. As such, we believe that a deeper understanding of HCI design principles may enhance the effectiveness of e-learning.

Consider the use of mobile learning (m-learning), virtual and augmented reality, and gamification. M-learning delivers training or educational content through smaller, mobile devices such as tablets or mobile phones, which presents several challenges for learners. For example, MBA students found it more difficult to read and analyze complex data on a tablet than on a computer (Kaganer, Giordano, Brion, & Tortoriello, 2013). Thus, researchers could apply HCI principles to inform e-learning designers on more effective ways to design layouts for text and data on different devices. As an example, findings regarding how people navigate and make decisions with decision-support systems (e.g., Todd & Benbasat, 1991) could help designers understand how interface design issues may affect the learning processes.

Virtual and augmented reality have improved training outcomes in several settings (Larsen, Oestergaard, Ottesen & Soerensen, 2012; Bowman & McMahan, 2007), but we need more research to investigate how it affects the learning processes and how to deploy it on different types of devices. Finally, the use of games, or gamification, in e-learning has been argued to increase motivation and learning (Salas, DeRouin, Littrell, 2005). Although some research supports these arguments (Dominguez et al., 2013; McDaniel, Lindgren, & Friskics, 2012), other research suggests that it can also reduce satisfaction and engagement in some situations (Foster, Sheridan, Irish, & Frost, 2012). By applying HCI, game, and learning design principles together, research can inform designers on the best way to apply gaming techniques into e-learning and where they can be most effective.

2.4 E-benefits

One of the most widespread uses of eHRM has been in the area of e-benefits. Organizations now give employees, managers, and retirees the opportunity to access and change their benefits on the computer or Internet any time of the day or night. These systems are often called employee self-service (ESS) benefit systems because employees can directly access their personal data in a HRIS and can personally select or modify their benefits without relying on HR (e.g., retirement plans, health insurance, etc.) (Marler & Dulebohn, 2005). Research has found that ESS can reduce the costs of some benefits transactions by over 90 percent (Hunter Group, 1999). However, to realize these savings, individuals must be able to effectively use computers to locate their personal files and to make changes to their records or benefits. One of the challenges facing organizations in implementing these systems is that they are not part of employees' regular jobs, so individuals are often less motivated to learn and use the systems than those that relate directly to their jobs (Marler & Dulebohn, 2005).

HCI and IS research can deepen our understanding of the use of technology in benefits administration in several areas. For example, research on expert systems and decision support systems could help inform researchers how interface design and the presentation of benefits could affect employees' effort, their choices about what benefits to select, and their satisfaction with their chosen benefits (Looney, Akbulut, & Poston, 2008; Sturman, Hannon, & Milkovich, 1996; Todd & Benbasat, 1991). In addition, research on computer self-efficacy (Marakas, Yi, & Johnson, 1998) can inform researchers in regards to how computing confidence can affect benefits outcomes. For instance, research has found that computer self-efficacy was positively related to user expectations about the outcomes of online self-service investing (Looney, Valacich, Todd, & Morris, 2006). Research has also found that employees with high levels of

technology anxiety were less satisfied with ESS and less likely to use ESS than those with lower levels of technology anxiety (Meuter, Ostrom, Bitner & Roundtree, 2003).

3 Overview of Papers

As we illustrate above, HCI principles can play an important role in eHRM. Therefore, this special issue highlights studies that use HCI and IS theories and design principles and apply them to the design of HRIS. In the last issue, we briefly summarized the first two paper in the special issue. We now summarize the remaining papers, two of which this issue includes. The first paper, "Conceptual Modeling in Human Resource Management: A Design Research Approach" by Stefan Strohmeier and Friedrich Röhrs (Strohmeier & Röhrs, 2017), builds on the conceptual modeling and design science traditions from computer science and information systems to develop a modeling language specifically geared to the human resource context. The authors develop and outline this new modeling tool and apply it to a specific business context, the assignment and completion of employee tasks in a sales setting. This paper is unique in that it is the first to focus on and develop modeling tools for HRIS.

Humayun Zafar, Adriane Randolph, and Martin Neale (Zafar, Randolph, & Neale, 2017) write the second paper, "Toward a More Secure HRIS: The Role of HCI and Unconscious Behavior". Unsecure employee behaviors are a major contributor to the breach of employee data, and researchers have proposed several interventions, such as security training (Puhakainen & Siponen, 2010), to increase employees' secure behaviors. However, many employees continue to engage in unsecure security practices. Zafar et al. argue that, for one, they continue to do so because current recommendations do not effectively address employees' habitually formed unsecure behaviors. In their paper, the authors build on the Martin-Morich model of consumer behavior (Martin & Morich, 2011) to develop a series of propositions about how design practices, context cues, and feedback can help break poor security habits and replace them with more secure ones.

The June issue will feature two additional papers. Sandra Fisher, Garett Howardson, Michael Wasserman, and Karin Orvis (Fisher, Howardson, Wasserman, & Orvis, 2017) write the first paper, "How Do Learners Interact with E-learning? Examining Patterns of Learner Control Behaviors". In this paper, the authors focus on the timely and critical topic of learner control. Using data from an e-learning program at a Fortune 500 company, Fisher et al. found that trainees stated a preference for having control over information and pace/time of instruction. In contrast to their stated desires, the findings suggest that learners leveraged five types of control: control over media, over pace, over sequence, over feedback, and over content. This paper should stimulate greater discussion about trainee preferences and behavior with learner control and it provides an interesting base to for additional research on how learner control can improve e-learning outcomes.

In the second paper, "Individual Appropriation of Learning Management Systems: Antecedents and Consequences" by Andreas Janson, Matthias Söellner, and Jan Marco Leimeister (Janson, Söellner, Leimeister, 2017), the authors develop and empirically test a model of faithful appropriation of e-learning software. Their findings suggest that, when learners faithfully appropriate e-learning software and the software is designed consistent with learning objectives, that learners will be more satisfied with e-learning and will find the training to be more valuable.

Finally, the September issue will feature the final three papers of the special issue. Julio Canedo, George Graen, Miriam Grace, and Richard Johnson (Canedo, Graen, Grace, & Johnson, forthcoming) write the first paper, "Navigating the New Workplace: Technology, Millennials, and Accelerating HR Innovation". Millennials are quickly becoming the largest generation in the workplace, but research suggests that their career expectations often do not align with their experiences (Graen & Grace, 2015). Thus, organizations need to better align HR and organizational policies with the needs and desires of Millennials. Cabedi et al. review the research on generational differences in personality, work and leisure values, and technology and develop a series of hypotheses regarding how one can use technology to more effectively align HR practices with the needs and desires of Millennials. In addition, they discuss how technology can support more innovative and high-performance organizational practices.

Murad Moqbel and Fiona Fui-Hoon Nah (Moqbel & Nah, forthcoming) write the second paper, "Enterprise Social Media Use and Impact on Performance: The Role of Workplace Integration and Positive Emotions". One of the challenges that organizations face today is a lack of employee engagement, which research has estimated to cost organizations half a billion dollars annually (Sorenson & Garman, 2013). Using a

field study in a large information technology firm, Moqbel and Nah found that the use of enterprise social media improved employee integration (a form of employee engagement) and in-role performance.

Finally, Anthony Neely, John Cotton, and Andrea Neely (Neely, Cotton, & Neely, forthcoming) write the third paper, “Technology, Training, and Development: Where Does e-Mentoring Fit?”. They review the literature on e-mentoring and develop a framework that addresses the motivation to participate in e-mentoring and the technology challenges and opportunities in e-mentoring. This paper is particularly timely given the dramatic growth in e-mentoring and the dearth of research in this area.

4 Conclusion

As we note in our introduction, the success of eHRM depends heavily on the interface between the computer and the user (e.g., applicant, employee, manager, retiree). The design of the interfaces that support HR practices and help overcome the challenges of competing tasks and interacting with others online should lead to more successful eHRM outcomes. In this special issue, scholars from the fields of information systems and human resources have come together with the goal of investigating how one can apply IS and HCI theories to the HR context to develop more robust and effective HRIS. We continue to hope that this special issue will help increase cross-disciplinary research efforts that spur innovation in HRIS design through the application of HCI principles to technology-enabled HR practices.

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