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EMPLOYEE REACTIONS TO TECHNOLOGY IMPLEMENTATIONS: A BEFORE AND WITHIN IMPLEMENTATION COMPARISON

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ABSTRACT

The implementation of new technology is common in organizations and has long been of interest to researchers. Despite this interest, much of this research has focused on the success of the system being implemented. Equally important to firms is an understanding of how these implementations affect an employee's attitudes toward their work environment. Therefore, this research seeks to understand how these implementations affect employee attitudes and commitment to the organization. Using a survey methodology, data will be collected in a mid-size manufacturing firm currently implementing barcode scanning throughout their organization. Specifically this study will compare employees who have not yet implemented the technology with employees who are in the middle of the implementation on several factors including barcode scanner self-efficacy, job self-efficacy, employee attitudes, job stress, satisfaction, and organizational commitment.

Keywords

Technology Implementation, Employee Reactions, Organizational Commitment, Job Satisfaction

INTRODUCTION

The information systems (IS) field has long been interested in the process, tools, and techniques which lead to successful systems implementations in organizations (cf. DeLone & McLean, 1992; Hartwick & Barki, 1994). Although successful implementations are a laudable goal, the impacts of a system implementation can extend beyond the system itself. Implementation of technology into the workplace can fundamentally restructure an employee's job, often changing the nature of the job and the nature of the employee's role and interactions within the organization. In turn, these changes can negatively affect employee attitudes toward their work and their employer (Lord & Hartley, 1998). In addition, the impacts of these changes on employee attitudes and perceptions may be stronger during the implementation phase than in previous phases of the system development process, because in this phase the employees (e.g. the end users of these systems) will begin to have actual experiences using these systems and will begin to understand the extent to which the technology will change their work. Thus, perceptions of employees may be very different during implementation than before implementation.

Therefore the goal of this study is to investigate differences in employee attitudes and organizational commitment between employees currently engaged in the implementation of the technology and those who have yet to begin the implementation process. Specifically we investigate differences in beliefs about an employee's ability to do his or her job (technology self-efficacy, job self-efficacy), employee perceptions of the implementation process (e.g. user involvement); and employee attitudes (job stress, job satisfaction, and organizational commitment). A better understanding of the impacts of the implementation processes on employee attitudes is important for multiple reasons. First, when employees have negative attitudes and perceptions of the organization, they will be less likely to engage in organizational enhancing behaviors (Meyer et al. 2002) In addition, as employees have options, they may seek to leave the organization, resulting in increased turnover and increased human resource costs such as recruiting & training.

THEORETICAL DEVELOPMENT

One of the challenges when implementing technology is that the technology can substantially change the way in which work is conducted. Employees may need to adapt their current work processes to the new technology as technology becomes infused in their work processes. We believe that these changes should lead to different estimations of job self-efficacy and technology self-efficacy. As employees begin to see how the technology changes their work, they may begin to see themselves as being less capable of fulfilling their job. .

In addition, before using the new technology, employees will be unable to make an accurate assessment of their skills to use the new technology. When this occurs, individuals typically over estimate their capabilities (Bandura, 1997). Further, those implementing the technology may encourage this overestimation by promoting how easy the technology is to use. Thus, when employees begin working with the new technology, they will begin to better understand their capabilities and will adapt their efficacy estimations based upon these new experiences, which should lower efficacy estimations. Therefore the following hypotheses were investigated.

H1a: During the implementation of a new technology employees will have lower technology self-efficacy than before the implementation of a new technology.

H1b: During the implementation of new technology, employees will have lower job self-efficacy than before the implementation of new technology.

A second area where there may be differences may exist is user involvement. User involvement refers to a psychological state that reflects the personal relevance of the system to the employee (Hartwick & Barki, 1994). One of the major challenges in systems development is keeping employees involved in process when much of this process is invisible to employees until the implementation phase. Once the system begins to be implemented, this can change as employees will begin to use the new technology in their jobs. At this point, the system becomes more tangible and real to them and because they are actively engaged with the system for the first time, they should be more likely to feel involved in the systems development process to a greater extent than they had at any time previous to the implementation. Therefore the following hypothesis was investigated:

H2: During the implementation of a new technology, employees will have higher perceptions of user involvement than before the implementation of new technology.

In addition, an implementation of new technology can increase levels of job stress because it often results in a change in job design and because it can lead to work overload. Most new technological implementations are implemented in conjunction with changes to job design. Previous modes of work are redesigned to support the new technology. In turn, the changes to job design can lead to fear, anxiety, and resistance to the implemented change (Smith and Carayon,. 1995; Turnage et al. 1994). Secondly, the process of implementing new technology can directly increase levels of job stress through work overload (Carayon and Karsh, 2000) as employees can easily become overwhelmed with all that is required of them when using the new technology. Essentially, employees are expected to perform well in their newly redesigned jobs as well as having to learn how to do this in the context of a new technology. Previous research on the implementation of information technology has also found that the implementation of a new technology can increase job stress (Korkunka et al. 1997). Therefore, we investigated the following hypothesis.

H3: During the implementation of a new technology, employees will have higher levels of job stress than before the implementation of new technology.

The implementation of a new technology can also lead to greater employee dissatisfaction with their jobs. Previous research has found that when new information technologies are implemented, employees experiencing an implementation of new technology will likely experience greater job dissatisfaction during the implementation process than before (Korkunka et al. 2003; Korkunka et al. 1997). The reason for this is that the implementation will introduce uncertainly and stress into the work environment and because of increased levels of planning, preparation, training and involvement required by the organization as part of implementations (Korkunka et al. 1997). In addition, previous research has found that increased levels of stress (as theorized in the previous section) are also associated with higher levels of job dissatisfaction (Zeytinoglu et al. 2007).

H4: During the implementation of new technology, employees will have lower levels of job satisfaction than before the implementation of a new technology.

Finally, we believe that organization commitment levels may differ between employees who are in the middle of implementing a new technology and those who have not yet begun implementing the technology. Specifically in this study, we focus on affective commitment or an employee's emotional attachment to the organization (e.g. they are committed to and identify strongly with the organizations) (Meyer & Allen, 1991). Any technology implementation will cause a change to an employees work environment, creating uncertainty to the employee, their job, and the organization. Because of this, previous research has argued that employees will be likely to resist this change (Marakas & Hornik, 1996). In turn, we argue that this can lead to a breakdown between the employee and their commitment to the organization, because the employee may feel less secure in the environment, may see a stronger divergence between the organizations goals and theirs, and in turn may be less likely to stay as emotionally attached to the company as they have been in the past. Previous research has found that organizational commitment is significantly related to an employee's commitment to organizational change (Lord & Hartley, 1998) with strongly committed employees less likely to desire organizational change. Together, this suggests that a technology implementation may disrupt employee commitment; leading to lower levels of employee commitment during the implementation than before it was implemented.

H5: During the implementation of a new technology, employees will have lower levels of organizational commitment than before the implementation of new technology.

METHOD

Data will be collected at a small manufacturing organization located in the northeast United States. This organization is implementing barcode scanning to manage inventory processes. The implementation is scheduled to occur over the next twenty four months, using a phased conversion plan. Currently two branches are engaged in physically implementing the technology with the other branches implementing the technology over the course of the next twenty four months. As part of an ongoing longitudinal study of employee reactions to technology implementations, data for this study will be collected using a survey methodology. Surveys will be distributed to all employees in the organization who will utilize the new barcode scanners at the same time. For the branches currently implementing the technology, the survey will be distributed approximately 2 months into the implementation process. For the comparative branches, the data will be collected approximately 6 months before beginning implementation.

The study will be a between subjects design, with t-tests used to analyze differences between employees at the branches currently implementing barcode scanners with those who have not yet begun implementing the technology. Data from approximately 40-60 employees will be utilized in the analysis.

Measures

Scales utilized in this study will come from a variety of sources. Where possible, we utilized existing scales. For barcode scanner self-efficacy (BCSE), no existing scale existed. Therefore, this scale was developed consistent with the recommended processes of Marakas, Johnson, and Clay (2007). The BCSE scale was developed to reflect how the barcode scanner technology is utilized within the organization. To ensure accuracy an interview was conducted with the head of research and development for the organization. A sample item included, "I believe I have the ability to enter new inventory using the barcode scanner." The job self-efficacy was developed broadly to reflect an employee's belief in their ability to do their job. The scale was developed to allow a broad base of employees to respond to it rather than developing a measure for each domain. Previous research utilizing self developed scales to measure specific types of self efficacy were used as a guideline (Riggs et al. 1994). A sample item included, "I believe that I have the knowledge and skills to perform my job." Table 1 contains a list of all scales and their sources.

Construct	Items	Source
Barcode Scanner Self-Efficacy	6	Self-Developed
Job Self-Efficacy	3	Self-Developed
User Involvement	8	Hartwick et al. (1994)
Job Stress	9	Parker and Decotiis (1983)
Organizational Commitment	6	Meyer and Allen (1991)
Job Satisfaction	36	Spector (1985)

Table 1. Scale Items

POTENTIAL RESEARCH CONTRIBUTIONS

Organizational implementations of new or upgraded technology are a reality in today's business environment. Although IS researchers have long been interested in how to most successfully implement these systems, much of this research has not sought to understand the affects of these implementations on employee attitudes toward the organization. We believe that this research should contribute to our understanding employee reactions to technology implementations in several ways. First, the research will begin to outline and develop a theory of how technology implementations can affect attitudes and commitment to the organization. Second, it will provide empirical evidence in support of these theoretical implications. Finally, the research should also contribute to our knowledge through its comparison of employees who are in the middle of a technology implementation with those who have yet to enter into the implementation of this technology. We hope that this research will stimulate further discussion of the relationship between employees, technology, and their relationship during technology implementation.

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