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ABSTRACT

When management mandates the use of a particular technology, that decision may be met with resistance. Potential resistance may be mitigated by both understanding the process of change (e.g., Cotter, 1996; Lewin, 1951) as well as better managing changes through tactics such as enlisting support from top management, gaining greater stakeholder involvement, and establishing stern consequences for non-compliance. Despite these efforts, wholehearted acceptance of a mandated technology by management may never be realized. The objective of this research-in-progress is to examine whether mandates evolve over time and posit the factors that influence mandates as a way to identify additional means to address potential resistance. Evidence of possible influences is identified through interview results from Thailand and plans for future research are discussed.

Keywords

Technology acceptance, mandatory technology use, open source technology

INTRODUCTION

Organizations mandate the behavior of their employees for a variety of reasons. In light of the recent economic downturn in combination with a much stronger enforcement of software copyright violations, many Thai organizations from both the public and private sector have mandated the use of open source software. One public Thai organization that has mandated the use of open source software since 2007 has been held up as an exemplar for other firms to follow. This organization employed several tactics to facilitate the change towards this mandate, such as holding multiple training sessions and establishing both incentives and consequences for employees, to reach a usage rate of 100%. Despite this apparent success, full compliance of this mandate by employees has not been reached. This non-compliance is even more striking since Thais generally demonstrate deference towards power relationships and accept power inequalities as part of their cultural heritage (Hofstede 2004).

Much is still unknown about whether or to what extent mandates are negotiable (Chae and Poole, 2005). Previous studies in information technology acceptance research have developed several theories explaining an individual's intention and behavior to use a particular technology. Venkatesh et al. (2003) integrated previous concepts and findings to formulate the Unified Theory of Acceptance and Use of Technology (UTAUT) to better explain volitional information technology use. This and many other information technology acceptance research (e.g., Hartwick and Barki, 1994; Karahanna et al., 1999; Moore and Benbasat, 1991) examine mandatory use on a continuum, which has the effect of treating it as a binary construct (Wu and Lederer, 2009).

The objective of this research-in-progress is to examine the complex nature of mandates, posit their likely influences, and present a case for how they may change over time. This research will provide the framework for a large-scale study of the mandated use of technology. A literature review is provided which further describes the research that has examined mandatory technology usage and also identifies the technology of interest to be examined, open source software. The methodology employed to examine the mandate of open source software is discussed as well as the tentative results. The future directions for this research are discussed, followed by some concluding remarks.

LITERATURE REVIEW

Technology Mandates

Information technology acceptance research (e.g., Hartwick and Barki, 1994; Karahanna et al., 1999; Moore and Benbasat, 1991; Venkatesh, 2003) often examines mandatory use on a continuum, which has the effect of treating it as a binary construct (Wu and Lederer, 2009). This is consistent with research that defines mandates by their consequences, which most often involve the choice of either following the mandate or leave the organization (Leonard-Barton, 1988). For employees that do value their jobs, the options that they have available to them are to not fully utilize the mandate, work to delay or obstruct its implementation, or even sabotage the effort (Markus, 1983; Kimberly, 1987; Leonard-Barton, 1988). As this type of research implies, mandates are much more complex and cannot be adequately captured as a binary construct. Further, the dependent variable of interest may not be the typical construct from the technology acceptance research that examines an individual's intention to use the technology, but may be best captured instead an individual's overall job satisfaction.

Brown et al. (2002) suggest that mandates and driven not only by managerial imperative, but from the organization's very structure and culture. Interpretation is strongly tied to an organization's norms, resources, and power structures (Giddens, 1984). Consequently, the interpretation of mandates is political by nature and its effectiveness depends on how the mandate impacts resource allocations and fits with existing organizational norms and behaviors (Chae and Poole, 2005). The implementation of a mandate may be rife with potential disagreements over how the mandate is carried out. Therefore, a problem solving process may result leading to consensus over the interpretation of the mandate or possibly disagreements in which different parts of an organization may interpret and act on the mandate differently (Chae and Poole, 2005). The resulting process that takes place once the mandate has been issued, both the formal and informal processes, is what this research examines.

Mandatory Technology Usage Influences

There are many factors that influence the decision to follow a mandate. The nature of the mandated technology itself will likely impact how an organization may interpret and act on the mandate. For example, some technology dimensions include how necessary the technology is to complete one's job as well as the interdependence of technology use, that is, whether non-use of organizational spanning systems (i.e., ERP) negatively impacts the technologies effectiveness for other users (Brown et al., 2002). Ciganek and Wills (2008) suggested additional dimensions of technology, such as the degree of newness and the degree of change, to be considered as individual employees are likely to interpret the technology differently.

In addition to these technology dimensions, organizational culture will also likely have a strong influence in how a mandated technology is received by an organization. Organizational culture is the set of shared assumptions, values, and behaviors that distinguishes one group, organization, or nation from another (Hofstede 2004). Depending on how well-suited an organizational culture is for a particular mandate, it will likely motivate an employee to pursue either formal or informal processes in reaction that mandate. Finally, organizational structure may also influence responses to technology mandates. Whether formal processes exist to manage organizational changes (e.g., clearly defined reporting structure, utilization of a formal change control system, etc.) and whether those processes are appropriately utilized will likely impact how employees follow those procedures or pursue informal processes to circumvent them in response to an organizational mandate. Each of these influences identified will help create a clearer picture of the complexity of technology mandates and the processes by which organizations interpret them. Organizations will likely strive for an appropriate balance among them through a process of negotiation in response to a technology mandate (see Figure 1).
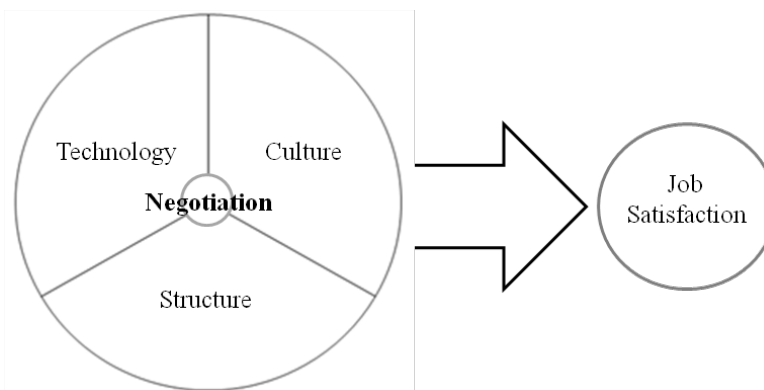

Figure 1: Balance Necessary to Achieve Job Satisfaction

Open Source Software

Open source software is computer software for which the source code and certain other rights that are normally reserved for copyright holders are provided under a software license that meets the Open Source Definition or that is in the public domain ("Open Source Software", 2010). The open source software that is examined in this research is Open Office, a popular desktop application software. Open Office 1.0 was first released in 2002 and its current release is version 3.1. There were at least 100 million individual downloads of Open Office version 3.0 and later by late 2009, which is an indication of its popularity and broad acceptance. The Open Office software consists of a variety of software applications that are comparable to the commercially available Microsoft Office. Microsoft Office applications are utilized by most organizations in nearly every country and are the industry standard desktop application. With respect to cross-technology compatibility between this software, users of Open Office can save work performed in Microsoft Office format. However, it is better save work in its own native Open Office format because users might lose some information if work is saved in a non-native format.

RESEARCH METHODOLOGY

In this study, we examined a public Thai organization that had implemented a mandate for its employees to utilize open source software over commercially available software. This organization was examined though observation and interviews over a two week period in 2009. Current and former employees were purposely selected to be interviewed because they were secretly using licensed software to perform their assigned work even after the mandatory use technology policy was in effect. Interviews were conducted in two separate sessions and lasted for an average of thirty minutes. The first session was a face-to-face interview while the second session was done using a telephone to clarify the information provided in the first session and to follow-up with further questions to receive additional information.

Organization Background

The Thai organization was established in 1986. The Thai organization consists of thirty-one functional departments that have responsibility to develop and research information technology before transferring that knowledge and experience to other public and private organizations. The majority of employees of this organization are very technical oriented and relatively young. In 2007, the Thai organization set out to be an exemplar corporation of its implementation of open source software, seeking to transfer its own experiences and knowledge of the process to other firms. The open source technology mandated use policy was utilized as a key factor to influence employee usage. In addition, several training sessions for all employees were carried out by the Thai organization. Other organizational resources, facilities, and tactics were utilized to support the usage of open source software, such as providing top management support and employing a knowledge management system.

TENTATIVE INTERVIEW RESULTS

During initial observations, the technology mandate appeared to be a success as employees were utilizing the open source software. The most popular applications used within the organization were email, web browser, document, and spreadsheet applications. Symptoms of problems began to emerge after the mandate was implemented. There was low user satisfaction in some departments and requests from departments to continue using commercial software. A relatively small department within the organization requested a budget to purchase a commercial software license because many of its employees frequently communicated with individuals external to the firm that were using that commercial software. In addition, many employees covertly utilized their personally-obtained commercial software to perform their daily work, choosing then to convert those files into the open source format before submitting them. The departments that were successful in their requests to continue using commercial software were unique from other departments within the organization. These successful departments were required to have employees that exchanged files with external organizations, while those departments that were not allowed to use commercial software mostly communicated within the organization (see Figure 2).
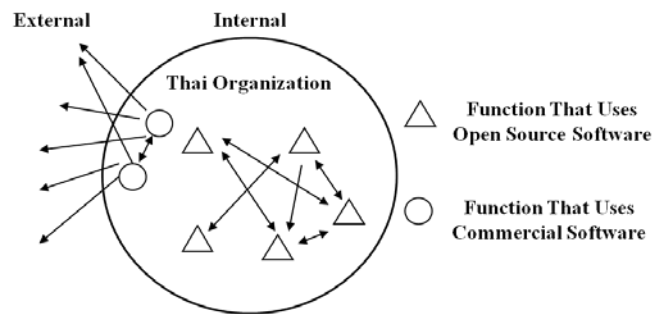

Figure 2: Graphical Depiction of Department Commercial Software Utilization

The Thai employees that were interviewed both complained about the inconvenience of exchanging the open source documents and spreadsheet files for their personal use, but were satisfied with the open source training they received and the support that was given from their managers. When an employee wanted to send a file for their own personal use, they often forgot to convert their file into the appropriate format. This resulted in an inconvenience for the employee and an inefficient use of time.

Although the Thai employees knew how to configure the open source applications to save their work in a particular format, they were not allowed because of the organizational mandate to exchange files using the open source format at work. From the interviews, it could not be determined whether departments that had the most connections with other internal departments would not have employees secretly using their own commercially licensed software. These interviews did reveal that the Thai employees would exchange more files for personal usage than exchange files to be submitted to their superiors. Further, there were employees in almost every department that at least once secretly used their own commercially licensed software to perform their assigned tasks. Through additional examination, we discovered that employees that secretly use the commercially licensed software often exchange file documents through social exchanges of files with friends external to the organization. These Thai employees complained that they were not very confident that the open source files would format perfectly with their counterparts that used the commercially licensed software. Thai employees often had to send multiple e-mails, having to re-format the file into the commercially licensed software because they had mistakenly sent e-mails with files in the open source format.

DISCUSSION

These interviews with Thai employees illustrate an instance where the mandated use of open source technology evolves and may continue to evolve through a series of internal negotiations. It is clear that in this situation, an organizational mandate is hardly a binary construct but an ongoing process involving politics, culture, and technology. This is similar to the findings of Chae and Poole (2005) which examined two separate mandates for enterprise system usage and found that as the development and implementation of these enterprise systems proceeded, adopters whose political or financial interests were threatened by the new systems began to search for 'cracks' in the mandate and began to try out strategies for resisting or redefining them. This negotiation process by the employees of the Thai organization in an attempt to redefine the open source mandate is somewhat surprising since Thais generally demonstrate deference towards power relationships and accept power inequalities as part of their cultural heritage (Hofstede 2004).

There are several avenues for future research to follow. First is to identify an appropriate research model to examine the potentially complex nature of technology mandates. Mandates may not be best categorized by a simple 'yes' or 'no' dichotomy but rather may be best observed over time examining the multiple influences on these organizational edicts. These influences that we intend to examine include both institutional features (i.e., organizational culture and structure) as well as facets of the mandated technology itself, such as how necessary the technology is to complete a task, its interdependence, and how radical the technology is. Future research must also participate in the ongoing debate of the appropriate dependent variable as satisfaction and motivation may be more suitable than behavioral intention to use open source technology. As indicated in the Thai interviews, a lack of satisfaction with open source technology was a key driver in the pursuit of negotiating the terms and the noncompliance with the organizational mandate. It appears to suggest that satisfaction and motivation with the mandated technology may far outweigh the behavioral intention to use that mandated technology (Brown et al., 2002; Chae and Poole, 2005). With respect to this research, however, the construct of job satisfaction might be more relevant to examine than the satisfaction with the technology itself. This is consistent with research that defines mandates by their consequences, which most often involve the choice of either following the mandate or leave the organization (Leonard-Barton, 1988).

CONCLUSION

When management mandates the use of a particular technology, that decision may be met with resistance. The majority of previous research that has examined the acceptance of mandated technologies has perhaps overlooked the complexity of an organizational mandate by capturing it as a binary construct. We believe that a mandate to use a technology will involve a process of negotiation over a period of time that has many influences. As a result, a mandate may either reinforce an organization's culture and formal structure or produce informal processes to address mismatches in the culture, structure, and technology. The objective of this research-in-progress is to examine whether mandates evolve over time and posit those factors that influence mandates as a way to identify additional means to address potential resistance. Evidence of possible influences was identified through interview results from Thailand and plans for future research were discussed.

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