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# Adaptation to Work Processes Embedded in IS Packages: An Organizational Routines Perspective

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## ABSTRACT

Although the adoption of information system (IS) packages offers many benefits over the development of custom-made IS, organizations often face severe difficulties in their adaptation to work processes embedded in the product and get unexpected and undesirable effects such as a decrease in IS post-adoption usage. By adopting organizational routines theory as its theoretical lens for interpreting results, this qualitative study's goal is to better understand this adaptation process and how it relates to IS post-adoption behavior. This proposed dissertation should contribute to IS theory and practice by providing insights on: the effects of possible misfits between IS packages designed for large business organizations yet applied within less conventional organizations, the organizations' internal dynamics as they adapt to work processes embedded in IS packages and their influence on IS package post-adoption behavior, and the role of technology's material properties in organizational change and organizational routines.

## Keywords

Information system post-adoption usage, information system packages, adaptation process, organizational routines, material aspects of technology.

## INTRODUCTION

Many times the successful implementation of technically-sound information systems (ISs) and their initial acceptance by end users did not provide the expected results. In order to be considered an organizational success, any IS needs to be continuously used in order for their expected benefits to materialize and create business value. As the new technology unfolds, IS usage may vary over time and even discontinue. In volitional behaviors such as website use in professional virtual communities, initial use (acceptance) is merely the first step toward realizing virtual community success as such success will further depend on members' continued use (or usage continuance) (Chen, 2007). While the use of newly implemented ISs within organizations is likely to be not voluntary but rather mandated, organizations may also face this phenomenon to some extent as end users can still exercise their agency by different means such as selectively using or misusing the information system's functions, and developing workarounds and shadow systems. Bhattacharjee and Premkumar (2004) suggest that user beliefs may change with time as users gain first-hand experience with the new IS. In their study of electronic data interchange (EDI) implementation, Morris et al. (2003) found that short-term usage of EDIs was unlikely to result in significant organizational change, but long-term usage was. This makes the factors influencing IS post-adoption behavior worth studying.

## IMPORTANCE OF THIS RESEARCH

This issue of IS post-adoption behavior has strong practical and theoretical implications. Regarding the business or practical implications, we can say that first, as IS post-adoption behavior may be seen as an undetermined result, top management's decision to implement a new IS can be seen as a risky project with unpredictable outcomes. Moreover, implementing an IS is an important project usually involving a lot of resources (time, human and financial resources). Getting the IS' expected benefits requires its continuous usage after its initial adoption by end users. Moreover, IS usage not only concerns internal users but also external users of the IS such as business partners and clients which can be costly to replace. Second, the fact

that IS post-adoption behavior may be seen as a highly contingent result complicates top management's decision to implement a new IS as the various tasks involved in the process of developing/purchasing, and implementing an IS require the organization's management to look carefully at several interrelated elements. Third, as a large range of IS post-adoption issues can arise during the discovery process of the new technology by its users, management needs to identify and manage those issues in an appropriate manner.

Regarding the theoretical or scientific implications, it is worth noting that even the successful implementation and initial acceptance of technically-sound ISs does not seem to guarantee the production of expected results and IS post-adoption usage long after its implementation. Various IS post-adoption issues can arise during the process in which IS users discover the new technology. First, the adoption of an IS is likely to create issues and changes within an organization as chances are good, even in the case of custom-made ISs, that some organizational needs will not be met and that some processes embedded in the IS will be different than the existing organization's work processes. Second, the functions offered by the IS may not fully meet users' work-related needs and the design of the interfaces may not be as intuitive and user-friendly as they wanted. As a result, new technical bugs, drawbacks, constraints or issues may appear, users may discover numerous misfits that perhaps require them to adapt their work processes to the new IS, etc. Given all these potential events, unexpected and undesirable results may happen. On the positive side, IS users can discover over time new functionalities, new ways of using the technology and new benefits thus leading to an increase in users' satisfaction. Users are also likely to become more at ease with the technology as they learn how to use it.

All these factors, positives and negatives, are likely to have an impact on IS usage well after its initial adoption thus contributing to variations in IS usage over time, and even usage discontinuance, as the new technology unfolds. Moreover, even when newly implemented ISs do generate their expected benefits, opposite viewpoints on the success of the overall project can develop within the same organization. Indeed, the implementation and adoption of a new IS in an organization may be seen as a success by top management while end users of the same IS may see it more as a failure. Who is right and who is wrong? How a successfully implemented and adopted IS may later transform into a failure?

Interestingly, despite the importance of IS post-adoption issues mentioned earlier, most of prior research has been on the implementation, and the initial acceptance and adoption of ISs, leading, for example, to the development of the well-known Technology Acceptance Model (TAM) by Davis (1989) and the application of Diffusion of Innovations (DOI) Theory by Rogers (1995) to the IS field. As stated by Parthasarathy and Bhattacharjee (1998), and more recently by Zhu and Kraemer (2005), IS post-adoption behavior is largely an unexplored area in IS research. Indeed, while innovation diffusion represents a complex process, much of the existing research has focused on the adoption decision and on measures such as "intent to adopt" and "adoption versus non-adoption" (Zhu and Kraemer, 2005). They argue that although this is helpful for understanding adoption decisions, we also need a better understanding of the post-adoption variations in usage and value. As such, they propose to view IT diffusion as a multistage process that starts at adoption and extends to usage and value creation. In summary, IS post-adoption issues, such as those mentioned earlier, are real and important. However, there is an apparent lack of research in this area. Therefore, researchers and practitioners need to better understand the dynamics of IS post-adoption behavior within organizations if they want to predict, maintain or increase IS usage over time.

## RESEARCH OBJECTIVE AND QUESTIONS

The research objective of this proposed dissertation is to contribute to knowledge and theory about IS post-adoption behavior, thus helping to fill a knowledge gap in this research area. My dissertation will focus on IS package post-adoption behavior. I expect this focus on IS packages to be particularly interesting as, compared to custom-made ISs, IS packages offer differences in terms of design, functionality, and work processes and can be seen as more rigid and less adaptable, thus potentially making them more constraining for adopting organizations. Indeed, a key characteristic of IS packages is that they generally embed work processes that are often cited as « best practices » of a specific industry. The adoption by organizations of IS packages and their embedded "best practices" favors standardization and uniformity, which in turn favor interoperability and compatibility between ISs, both within and between organizations. However, the adaptation process by organizations to the IS package that is often necessary may likely put organizational needs, processes, and even key competencies at risk as "...adhering to an industry template may mean that the company loses a better, perhaps even more competitive, way of performing a key business process" (O'Leary, 2000, 153). Moreover, this proposed research will specifically look at the material aspects of IS packages (material properties and technical capabilities or functionality) and how organizations adapt to and interact with them. Since material aspects of a technology are likely to have an impact on the adaptation process by organizations to this technology, it is important for both practitioners and researchers to understand the specific characteristics and material aspects of IS packages. By doing so, my research will respond to the call made by Wagner et al. (2006) and Yeow and Sia (2008) for research on the adoption and use of IS packages and their embedded work

processes sometimes called “best practices”. Overall, I plan to complement their work by getting insights on the complex internal dynamics involved in the process by which organizations adapt to work processes embedded in IS packages and on the factors contributing to IS package post-adoption behavior. More specifically, this proposed dissertation is aimed at answering these two research questions:

- 1) “How do organizations which implemented an IS package adapt to work processes embedded in the product?”
- 2) “How does this adaptation process by organizations to work processes embedded in IS packages relate to IS post-adoption behavior?”

## **PRIOR WORK ON THE ADOPTION AND USE OF IS PACKAGES**

Overall, most prior studies on the implementation, adoption and use of software packages by organizations have focused on the adoption of enterprise resource planning (ERP) system packages, are tilted toward human agency and social aspects, and thus neglect the influence of material aspects of technology. Some of the problems identified in the literature were: cultural issues (Soh et al., 2000; Rajapakse and Seddon, 2005), integration issues (Soh et al, 2003; Rajapakse and Seddon, 2005), the level of economic development of various countries (Rajapakse and Seddon, 2005), unexpected consequences (Boudreau and Robey, 2005; Kallinikos, 2004) and the misalignment between software package features and organizational requirements (Soh et al, 2000; Wang et al., 2006; Scott and Wagner, 2003). It is interesting to note that even after two decades of ERP experience, organizations are still facing problems with ERP systems (Rajapakse and Seddon, 2005). While enterprise system implementation has received much attention in the literature, their use is often neglected (Devadoss and Pan, 2007). In a noteworthy exception to this claim, Wagner et al. (2006) state that as best practices are transferred through processes/templates and are then embedded into software through the configuration of the software, it is valuable to study the dynamics involved in their local appropriation and took a critical position on the value of these embedded best practices. As such, they clearly call for future research on the adoption of best practices by organizations. Surprisingly, the literature reveals few accounts of the process by which these technology-based “best practices” are contested and changed. In-depth understanding of how to make these packages work and the related social dynamics remains obscure (Wagner and Newell, 2007; Wagner et al., 2006). Yeow and Sia (2008) argue that such a deeper understanding is crucial, not only to minimize the negative consequences of implementation failures, but also to ensure that the system, once put in place, will be used. They claim that this is particularly pertinent when embracing “best practice” packages because such an approach requires organizations to change radically in terms of their work processes and practices.

As one can see, the adoption of an IS package will likely require the adopting organization to go through an adaptation process, as some organizational needs will not be met and some work processes embedded in the IS package will not be aligned with the organization’s work processes. Most importantly, these adaptation issues may become more frequent over time, as more organizations are likely to find attractive the strategy of purchasing and implementing commercial off-the-shelf (COTS) IS packages offering ready-to-be-implemented “best practices”. This is why IS researchers need to better understand how organizations adapt to work processes embedded in IS packages and how this adaptation process relates to IS post-adoption usage.

## **THEORETICAL BASIS**

For this proposed dissertation, I have chosen organizational routines theory, as developed most completely by Brian Pentland and Martha Feldman, as my conceptual lens. In almost every organization, work is organized and accomplished via organizational rules and work processes. Organizational routines can be defined as repetitive, recognizable patterns of interdependent actions carried out by multiple actors and consist of two different but related aspects: the ostensive (abstract idea) and the performative (performances) aspects (Feldman and Pentland, 2003). Because they involve multiple actors, organizational routines need to be distinguished from individual routines which only involve one person in isolation. Differences in intentions, orientations, and interpretive power may exist between participants in organizational routines. Moreover, the interdependence between actions and actors, an essential characteristic of organizational routines, constrains individual agency. However, organizational routines are not conceived merely as repetition of highly constrained activities but rather, as Pentland and Feldman argue, as generative systems producing a different performance each time that can contribute to either organizational stability or change. This argument focuses on human agency and denies the ability of technologies to determine human actions. Cohen (2007) further distinguishes two types of organizational routines: dead and live organizational routines. Dead routines only involve artifacts while, in contrast, any organizational routine that involves people who are capable of learning from experience is at least partially a “live” routine. Using terms from actor-network theory, the term actants can be thus preferred to the term actors to point out the fact that both humans (people) and non-humans (artifacts) can be participants in organizational routines. Organizational routines theory considers both the structure (ostensive aspect) and human agency (performative aspect) on an equal basis without favoring one or the other. It also

considers the duality of structure (ostensive aspect) as it can both constrain and enable patterns of action (performative aspect). Finally, organizational routines theory provides mechanisms to help explain how the ongoing collective accomplishment of organizational routines can contribute sometimes to organizational stability and sometimes to organizational change.

## RESEARCH DESIGN AND METHODS

For this proposed research, I plan to do a qualitative field study involving a multiple-case study design. I will use organizational routines theory as my theoretical lens for interpreting results and focus on organizational routines as the unit of analysis. By choosing three mid-size labor unions in Canada as my research sites and their accounting information system (AIS) package as my choice of IS packages, I expect to get novel and relevant insights about my research questions. First, work processes in labor unions are likely to demonstrate a high contrast with those used in more traditional large business organizations for which most AIS packages were developed for. Often forced to adopt such AIS packages, this high contrast between work processes should significantly influence their adaptation process to work processes embedded in the IS package. Second, as accounting work involves several departments and revolves around many organizational routines constrained by accounting principles, norms, and rules, the ongoing collective accomplishment of mundane accounting routines is expected to show little variation and thus to contribute to organizational stability. However, focusing on organizational routines as the unit of analysis may reveal unexpected variations in the performances of accounting routines. Using three research sites, two of them using a different version of Sage Accpac and one using Microsoft Dynamics GP as their AIS package, should allow the possibility to compare and contrast these three organizations' adaptation process, IS package' material aspects and usage, and provide insights on the relationships between all these elements.

Based on a philosophical perspective of hermeneutics, I will adopt an interpretive perspective which seeks human articulations of the socially constructed reality as individuals attempt to make sense of their surroundings and persuade others of their perspective (Wagner et al., 2006). Bansler and Havn (2004) state that interpretive field research is particularly appropriate for understanding human thought and action in natural organizational settings.

## DATA COLLECTION

The predominant method of data collection will be through semi-structured individual interviews with, in each of the three organizations, a broad range of people concerned and/or interacting with the AIS package and having various organizational roles. I expect these informants to be representative sources of relevant information about the implementation, adoption and use of the AIS package in their organization (Miles and Huberman, 1994). The general manager of each research site will help identify key informants and schedule the interviews that should last between one and two hours. A first draft of an interview guide will be developed and pre-tested for face and content validity with two researchers and two labor unions' general manager. This procedure will likely result in some modifications of the interview guide. Based on the informants' consent, interviews will be audio-recorded and/or notes will be taken during them and soon after to capture relevant data about the context and the relationships between the interviews. Summaries of interviews will later be shown to the corresponding informants in order to corroborate the evidence collected and to enhance the confirmability and credibility of the findings (Miles and Huberman, 1994).

Other data collection methods will be field observations and the analysis of relevant internal and external documents such as notes from meetings, training sessions, and the documentation related to projects, softwares, and hardware. Field notes documenting the observations will be taken at the same time as the observation or, if not possible, they will be taken as soon as possible after the observations in order to capture as much contextual data as possible. The data collection and data analysis processes will be done in an iterative manner to guide future interviews and help elicit relevant conceptual themes.

## DATA ANALYSIS

Similar to work done by Robey and Sahay (1996), I plan to analyze interview data by using an iterative analysis process, called the hermeneutic cycle by Klein and Myers (1999), that will be performed in four steps: 1) coding the transcribed texts according to a master list of preliminary categories (Miles and Huberman, 1994) based on theory (org. routines theory) and literature, which corresponds to a Straussian version of grounded theory in which prior theory, literature, and personal and professional experiences serve as a guide; 2) analyzing the uncoded segments of texts to modify established categories and form new categories if applicable; 3) integrating the different codes into more general conceptual themes, and 4) comparing and contrasting the different themes between the three sites to find similarities and differences and relating them to previous insights in order to generate a more general understanding of the phenomenon. Overall, this iterative process is aimed at ensuring consistency in the method by which texts are coded, which is comparable to the notion of interrater reliability as

required in positivist research (Robey and Sahay, 1996). I will use the qualitative research software package NVivo 8 from QSR International Pty Ltd to help make the coding process more efficient.

## EXPECTED CONTRIBUTIONS

This proposed study, helped by the adoption of organizational routines theory as my theoretical lens for interpreting results, should be of high relevance and importance to both practitioners and researchers. First, I expect to get novel insights on the effects of possible misfits between IS packages that were designed for large business organizations yet applied within less conventional organizations. Second, novel insights should be obtained about the dynamics involved within organizations as they adapt to work processes embedded in IS packages. Looking at similarities and differences between the three research sites will add to the findings. More specifically, I expect to better understand the impact on the adaptation process of the technology, its different aspects (ostensive, performative, and material), the organizational routines and their external environment, and the differences in intentions, orientations, and interpretive power between participants in organizational routines. Moreover, this proposed research should contribute to IS practice by providing practical solutions to practitioners regarding technology-mediated organizational changes in order to help them manage the adaptation process and cope with its related difficulties while trying to avoid undesirable outcomes such as IS post-adoption usage discontinuance. Third, I should get novel insights on the influence of this adaptation process on IS package post-adoption behavior. Over time, participants may introduce little variations in the performance of organizational routines that may have a durable impact on IS post-adoption usage.

Last but not least, I expect to get novel insights about several controversies and intellectual puzzles in the IS field related to the exact role of information technology (IT) artifacts and their material aspects in organizational change, their relationships to organizational routines and their theoretical treatment as outside or inside organizational routines. While often neglected in prior research, material aspects of technology enable, thus permitting the expression of agency, and constrain human actions, thus acting as a structure, without determining them. These material aspects may be difficult to see for IT artifacts since most of them are softwares rather than solid physical objects. However, they can be represented by software's features that also provide opportunities for or constraints on human actions. This research provides a valuable opportunity to better understand how the material aspects of IS affect the design and performance of organizational routines and work processes.

On one hand, Pentland and Feldman argue that IT artifacts, just as any artifact in general, do not meet the definition of organizational routines and thus explicitly locate them outside of organizational routines. Considering IT artifacts outside organizational routines means that they are part of organizational routines' external environment, which somewhat limits their role. According to this perspective, ignoring IT artifacts may then reduce or even eliminate any influence they may receive from or have otherwise on organizational routines. However, Pentland and Feldman also state that artifacts may both influence and be influenced by the ostensive and performative aspects of routines.

On the other hand, Volkoff et al. (2007) explicitly argue that IT artifacts are different from other artifacts as routines, data and roles may be embedded in IT artifacts thus giving them a material aspect. According to them, organizational change arises from the interactions between the ostensive, performative and material aspects within the organizational element itself or between different organizational elements. This perspective is coherent with actor-network theory in which non-human "actants", such as IT artifacts, have an active role in that they can influence and be influenced by interactions within a network (such as an organizational routine) and thus are considered on an equal basis with human actants. By providing novel insights on such important theoretical issues, I should make a solid contribution to IS theory while engaging directly with the IS artifact.

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