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OPENING UP THE ADOPTION SHELL. “SHALLOW” AND “DEEP LEVEL” USAGE PATTERNS IN HEALTHCARE ORGANIZATIONS

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Abstract

This study builds on organizational theories and the Theory of Reasoned Action (TRA) to investigate individual responses to introduction of information systems in healthcare organizations. We argue that usage has been often times conceptualized too narrowly in IS research as adoption or rejection of IS. We aim to open up the concept of use and uncover different types of adoption responses when it comes to introduction of new information systems in organizations. We conceptualize use based on organizational theories (Kelman, 1957; Kostova, 1999; Kostova & Roth, 2002) as being comprised of two elements: implementation and internalization. Variations in the levels of these two components lead to different usage patterns that we call “shallow” use and “deep” level use. Implications for theory and practice are discussed.

Keywords: IT adoption and use, types of use, TRA, mandatory settings, shallow use, deep use.

Introduction

Recently there has been an increased interest and focus on the IT and healthcare as President Bush has identified health information technology as one of the most important technology areas for America's future. “America needs to move much faster to adopt information technology in our health care system. Electronic health information will provide a quantum leap in patient power, doctor power, and effective health care” said Tommy Thompson, Health & Human Services Secretary on July 21, 2004. He further mentioned that health information technology can improve quality of care and reduce medical errors, by cutting healthcare costs by 10%.

However, in order for IT to bring all the enhanced effectiveness in healthcare, healthcare professionals must use IT. Devaraj & Kohli (2003) in their study in a healthcare setting and found that technology usage was positively associated with measures of hospital revenue and quality such as mortality, revenue per admission and revenue per day. Thus, the final benefits from IT seem to be determined by its users. The prospect for a significant impact of IT is contingent on how physicians are prepared for the introduction of computers to their work routine and how they take to it (Morrissey, 2001).

Little is known about the adoption and use of healthcare IS among healthcare professionals. Some doctors may resist IT innovations as they are not familiar with IT or they may view IT as a clerical or nursing task. The objective of this study is to investigate individual responses to introduction of information systems in healthcare organizations and uncover whether there are different types of IS usage behavior. The importance of this research stems from the fact that usage has been conceptualized in IS research as dichotomous: adoption or rejection. As we will show in the next section, we propose a finer grained conceptualization of system usage. The following are the research questions guiding this study:

- RQ1: How do healthcare professionals react to the introduction of new systems?*
- RQ2: What types of adoption patterns can be observed in their behavior?*
- RQ3: What leads to faithful use?*

Theoretical Background

In this study, we are drawing from organizational theories (Kelman, 1957; Kostova, 1999; Kostova & Roth, 2002) and the Theory of Reasoned Action (Ajzen & Fishbein, 1980). We briefly review each theory in the next paragraphs.

Organizational Theories

Kostova (1999 p.311) theorized the adoption process of a quality management system as being comprised of two distinct elements: (1) the diffusion of a set of rules (that may come with a new technology being implemented) and (2) the transmission of an “infused with value” meaning of these rules among the individual recipients. In this view, “adoption does not end with the formal rules describing a particular practice but continues until these rules become internalized” by individuals affected by the introduction of a new practice (Kostova, 1999). Thus, in this view, successful adoption of a practice (or system) is seen as a two stage process: the *implementation* of a system and the *internalization* of the belief in the value of the adoption (Kostova & Roth, 2002).

Kostova (1999 p. 311) defines “implementation” as the degree to which a potential adopter follows the formal rules implied by a practice. Implementation is expressed in the external and objective behaviors and the actions required or implied by the practice (Kostova & Roth, 2002). “Internalization” is defined as the state in which the individual adopters attach symbolic meanings to a practice being introduced. Internalization reflects the positive attitudes and perceptions about the value of a practice (Kostova & Roth, 2002) that goes beyond its initial adoption towards the institutionalization of the practice in a work setting. To this extent, variation in the adoption response is reflected in different levels and configurations of these two components, implementation and internalization.

Saka (2002) and Wood & Caldas (2002) uncovered multiple paths to adoption of work practices and TQM systems respectively, thus pointing out that usage is not uniform across individuals and organizations. Different types of usage including “ceremonial usage” have been uncovered based on different levels of implementation and internalization.

The Theory of Reasoned Action (TRA)

TRA (Ajzen & Fishbein, 1980) is a widely studied theoretical model from social psychology designed to explain virtually any human behavior. According to TRA a person’s performance of a specified behavior is determined by his or her behavioral intention to engage in the activity. Behavioral intention is jointly determined by the person’s attitude and subjective norm concerning the behavior in question. Attitudes capture an individual's positive or negative feelings about performing the target behavior. Subjective norms capture an individual’s assessment of the extent to which important referent others would desire the performance or nonperformance of a specific behavior.

TRA has received support across a variety of disciplines such as psychology, sociology, marketing and IS (Agarwal, 2000). In IS, TRA is the theoretical foundation for one of the most well known theories, the TAM (Davis et al., 1989). TRA has been empirically tested and has found support in the context of acceptance of IT in a variety of IS studies (Taylor & Todd, 1995; Karahanna et al, 1999) to name a few.

The Context of Information Systems Use

The context of IS use can be seen as a continuum ranging from mandatory use to voluntary use. However, most adoption contexts fall close to one extreme or another. A mandatory use environment is defined as one in which users are required to use a specific technology or system in order to keep and perform their jobs (Brown et al., 2002). In this case, there are limited alternatives to use of the system. A voluntary use environment is the one in which individual users perceive the adoption/use decision to be a willful choice (Brown et al., 2002).

When it comes to technology, many adoption environments are not volitional (Ram & Jung, 1991 as cited by Brown et al., 2002). Many decisions to implement new information systems are made by the upper management and individual users affected by these decisions have sometimes no control over these decisions. In a healthcare environment, it is usually the parent corporation that decides upon the introduction of a new system in all of the hospitals under its control.

Different Types of IS Usage Behavior

It is important to distinguish between different types of adoption responses when it comes to information systems. It is when the individuals engage in “deep usage” that enhanced performance is achieved rather than when individuals use a system

superficially. Our premise is that an IT may be fully understood and faithfully used by some users while some others may appear to use the IT without fully taking advantage of its capabilities.

In this context, we define “shallow use” or “instrumental use” as a minimal use of an IS as a response to coercive or mandated pressures from the part of management. “Deep usage” or “ceremonial usage” occurs when individuals use a system at its fullest by taking full advantage of its capabilities. As pictured below, shallow usage is only the top of the iceberg or a façade usage; users may only use a system because it is mandated but not take advantage of its capabilities. In this case, real change is not permitted, things are done the same way as before the introduction of the new technology. Deep level usage reflects the effective use of the technology in an instrumental manner that can potentially change the way work is carried out in the organization. Technology is fully understood and used in problem solving processes (Bush, 1987).

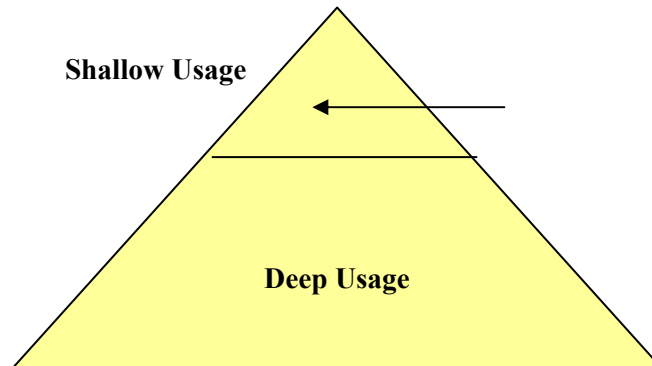


Figure 1: Shallow and Deep level usage patterns

A Model of Information Systems Use in a Mandatory environment

Our model integrates organizational theories and TRA to theorize about two distinct usage behaviors: “shallow” and “deep level” usage. Our focus is on a mandatory type of environment where an organization’s upper management decides to introduce a new IT system, which seems to be the case with many healthcare systems. Our model is presented in Figure 2 below.

We theorize that in a mandatory adoption environment, coercive or mandated pressures to adopt a system will automatically lead to its implementation as individuals affected will not have a volitional choice whether to use the system or not. However, it is attitudes (internalization) that would determine the different types of usage. To the extent individuals form positive attitudes about a system, they will internalize its use, (see the system compatible with their value system) and they will form a behavioral intention to use it in a “deep” or “instrumental” manner. To the extent individuals do not form positive attitudes about a system, they will solely implement it because it was mandated but not fully use it (“shallow” usage).

In both cases, based on TRA, behavioral intention determines the actual behavior to use an IS either in a “shallow” or “deep” manner. It is important to emphasize that in a mandatory context, implementation may be a given, individuals usually do not have any choice other than using a system. However, usage may be only superficial, with users minimally using a particular system without actually believing the system has the potential of enhancing the way they do their work. It is internalization that finally determines the depth of usage behavior. Distinguishing between different types of IS usage is important as it is only when individuals use a system faithfully that IT can bring benefits such as enhanced productivity and organizational performance.

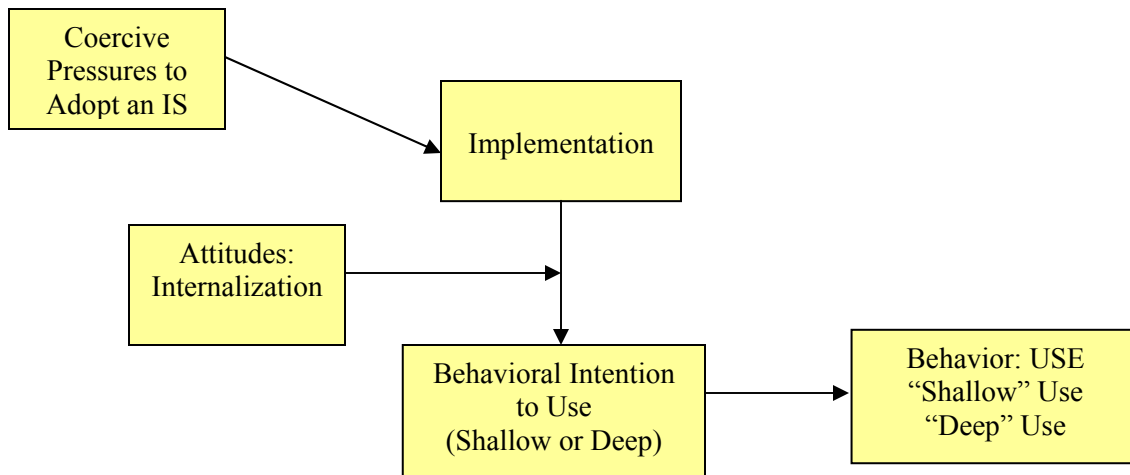


Figure 2: A model of IS use in a mandatory environment

The following propositions emerge from our model:

P1: The more coercive the pressure for adoption of an IT system, the more likely it is that the system will be implemented (in a mandatory setting).

P2: Formation of positive attitudes about an IT system being introduced and the internalization of such attitudes will lead to a behavioral intention towards adopting the system in a “deep” manner.

P3: Formation of negative attitudes about an IT system being introduced and the internalization of such attitudes will lead to a behavioral intention towards adopting the system in a “shallow” manner.

Implications

Our research has implications for the acceptance, use and implementation of new healthcare systems. As the healthcare environment is rapidly increasing investments in IT, it is important to conduct a study to understand technology acceptance and use in this environment. This would be beneficial not only for other academics (as a starting point to test this model) but also for managers and other healthcare professionals to better understand how individuals can react to introduction of new IT systems in such an environment.

This research uncovers the subtle levels of technology usage in the workplace. We argue that IS usage has been conceptualized too narrowly and we seek to expand usage by conceptualizing two different types of usage behavior. This is important as some individuals may appear to use IT in the workplace, but actually resisting it in subtle ways by minimally using the system. In fact, “shallow” use may be a form of user resistance.

Our research has also implications for the management of the change process in healthcare organizations. It is important to point out that a new IT will always bring about change, but sometimes this change can be encapsulated or controlled by individuals that are not ready for a change yet. It is only when individuals use a system in a “deep” manner that real change is achieved leading to improved job performance and organizational performance. Managers should be aware of these types of usage behaviors when introducing new IT systems.

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