

December 2006

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Ortíz de Guinea, Ana, "Different Conceptualizations of IS Post-Adoptive Behavior" (2006). *AMCIS 2006 Proceedings*. 101.
<http://aisel.aisnet.org/amcis2006/101>

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Different Conceptualizations of IS Post-Adoptive Behavior

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ABSTRACT

This paper proposes the examination of IS post-adoptive behavior from four different perspectives: 1) the traditional perspective grounded in TAM and research on habit, 2) the ecological perspective which emphasizes the interaction of users with IT without the necessity of cognition, 3) the affect-object perspective which highlights the role of emotion in determining behavior, and 4) the sensemaking perspective which states that cognition occurs after users are confronted with unexpected outcomes while using IT. In order to explore these different conceptualizations of IS post-adoptive behavior, a methodology based on case-studies and experiments is proposed. Thus, the proposed research goes beyond TAM to consider other theoretical perspectives in IS post-adoptive behaviors from disparate disciplines that will provide an enriching understanding of the phenomena under study.

Keywords

IS, usage, use, post-adoptive behavior.

INTRODUCTION

The majority of research on individual IT use has focused on the conscious cognitive processing associated with individuals' pre-adoption activities, adoption decisions and initial use behavior (Davis, 1989; Venkatesh, Morris and Davis, 2003). However, the post-adoptive behavior with respect to IT remains underinvestigated and researchers are calling for studies in this area (Jasperson, Carter and Zmud, 2005; Kim and Malhotra, 2005). IT post-adoptive behavior encompasses feature adoption and extension use behaviors made by a user after an IT application has been applied by the user in accomplishing his/her work activities (Jasperson et al., 2005). Further, the notion of IT use is itself problematic since its conceptualization lacks an accepted theoretical foundation (Burton-Jones and Straub, 2004; Trice and Treacy, 1988). Finally, most research on IS usage (Davis, 1989; Davis, Bagozzi and Warshaw, 1989; Venkatesh et al., 2003) treats the IT artifact in terms of users' perceived features of it, thus, overlooking any potential theorizing about it without the mediation of users' cognitions. Therefore, it is important to look at post-adoptive IS use because it is the everyday interaction between users and IT which partly determines users' performance within their work environments. Thus, the purpose of this dissertation is to address the following research questions at the individual level of analysis:

- How do different theoretical perspectives help in the understanding IS post-adoptive behavior?
- How do individuals cope with interventions (i.e., errors) when using IS?

LITERATURE REVIEW AND THEORETICAL DEVELOPMENT

This thesis reviews a variety of literatures, including acceptance models, depth and breadth of IS use, IS post-adoptive behaviors, sensemaking, and alternative theories of human behavior (i.e., ecological psychology and the affect-object paradigm). Based on this review, it is concluded that usage needs to be conceptualized taking into consideration its three elements: the user, the system, and the task (Burton-Jones and Straub, 2004). That is, individual-level system usage is "an individual user's employment of one or more features of a system to perform a task" and its operationalization is likely to vary across contexts (Burton-Jones and Straub, 2004, p. 6). Behavioral research needs to be specific to a particular target – in this case, the system – in order to have any predictability potential (Petty and Cacioppo, 1996) and leading scholars are calling for conceptualizations of the IT artifact (Benbasat and Zmud, 2003; Orlikowski and Iacono, 2001).

Because IS post-adoptive behaviors occur over time and are dynamic, process models are appropriate to represent such phenomena (Langley, 1999). IS post-adoptive behaviors will be represented by four process models¹ from alternative perspectives to human behavior: the traditional perspective on IS post-adoptive behavior, the ecological perspective, the affect-object perspective, and the sensemaking perspective. Each perspective has different assumptions, influences the way the problem is approached and what is picked up as relevant data, and thus, may provide different answers to the same question (Allison, 1971). The preference for using alternative perspectives instead of developing a general theory is that alternative perspectives enrich understanding, whereas the imperative of a general theory may hinder it (Allison, 1971). This is especially the case when the phenomenon under study has not been given much research attention (Allison, 1971). These four perspectives were chosen over other alternatives (i.e., structuration theory) for various reasons. They can be analyzed at the individual level, provide sufficient contrasting conceptualizations of human behavior for looking for differences among them in various situations, and emphasize different motives as drivers of behavioral acts.

Traditional Perspective on IS Post-Adoptive Behavior

Past literature on post-adoptive behavior has taken the Technology Acceptance Model (TAM) as the primary theoretical foundation for research, highlighting a conscious cognitive process by which individuals make decisions about their everyday IS use (Jasperson et al., 2005; Kim and Malhotra, 2005; Limayen, Hirt and Cheung, forthcoming). There are two basic conclusions that can be drawn from the literature. First, it is believed that as an individual engages more and more in the use of technology, there is a shift away from these cognitive factors (Jasperson et al., 2005; Limayen and Hirt, 2003), and past use of IS and habit become the main predictors for usage intentions (Cheung and Limayen, 2005; Kim and Malhotra, 2005). Second, behaviors that have become almost completely automatic without the necessity of use (i.e., IS use), may again come under the control of cognitive processes if the person once more becomes motivated to think about the behavior when an interruption occurs (i.e., error) (Jasperson et al., 2005; Louis and Sutton, 1991).

Ecological Perspective

Ecological psychology emphasizes that cognitively-driven behavior is more an exception rather than the norm in everyday situations (Heft, 2003). Individuals act upon the opportunities provided to them by the environment without having to engage in cognitive information processing (Shaw, 2001). The process of sensing information in the environment without the mediation of cognition is referred to as “direct perception” (Shaw, 2001, p. 89).

This perspective highlights the role of affordances and individuals’ effectivities (Chemero, 2003). In spite of current debates on the definition of affordances², affordances are generally described as “a relation between an human/animal and the environment, that is, an emergent quality or feature of the situation” (Chemero, 2003, p. 42). This definition highlights the functional properties of the environment in relation to the capacity of humans, and directly relates to the term effectivities. Effectivities are the abilities of particular individuals to act upon the opportunities provided to them by the environment (Chemero, 2003). That is, affordances although residing in the environment, can only be realized when they match an individuals’ effectivities. Accordingly, IS use is a dynamic process, a “perceiving-acting cycle” that encompasses the continually unfolding interactions between the person and environment (Young, Depalma and Garrett, 2002, p. 53). Finally, because of this perspective’s emphasis on affordances, it provides a fruitful starting point from which to begin to theorize about the IT artifact (Benbasat and Zmud, 2003; Orlikowski and Iacono, 2001).

Affect-Object Perspective

Another alternative view emphasizes the role of affect in human behavior (Mohr, 1996). Contrary to traditional psychologists’ assertion that emotion is posterior to cognition (Davidson 1984; Sun and Zhang 2006; Zajonac 1980; Zajonac et al. 1984), affect is proposed as the primary driver of behavior (Mohr, 1996). More specifically, humans hold representations of environmental objects (i.e., IT artifact) and events (i.e., interventions) in their brains that are attached to affective tags (affect associated with the object/event) as a result of either learning, experience, or a genetic code (Mohr, 1996). These affective tags are the primary drivers of behavior, since they motivate individuals’ behaviors with relation the events and objects they encounter in their environments (Mohr, 1996).

¹ Due to space constraints the process models are not included in this paper. However, the process models are available upon request from the author.

² See the recent special issue of Ecological Perspective – 2003, vol. 15, issue 2 – on affordances

This perspective stresses users' immediate responses to IT. That is, users are seen as giving immediate and timely responses based on the affect they associate with the IS states and feedback. It is the affect-object mechanism that drives behavior, not cognition nor conscious intention. Affect is ignited both by mental information (not cognition) and sensory impressions directly perceived from the environment at that moment. The affect-object mechanism operates via mean-ends procedure to select the affect-object pair that has the greatest valence or intensity for the individual at the very moment of behavior (Mohr, 1996).

Sensemaking Perspective

Another approach to human behavior that takes into consideration the environment is sensemaking. Sensemaking can be defined as "reciprocal exchanges between actors and their environments that are made meaningful and preserved" (Weick, Sutcliffe and Obstfeld, 2005, p. 414). As part of the environment, the IT artifact can both hinder and/or trigger sensemaking (Griffith, 1999; Weick, 1990). Furthermore, certain types of technological features are more likely than others (i.e., options related to the use of core features) to trigger technology sensemaking (Griffith, 1999).

The sensemaking process encompasses 1) the enactment of the environment (indirect perception of the environment since individuals reconstruct many aspects of it), 2) selection of information from the environment in order to reduce the equivocality, and 3) the retention of the information that seems relevant (but might not be the most suitable) in order to form new action (Weick, 1979; Weick, 1995). Finally, this perspective emphasizes cognition a posteriori. That is, cognition and thus, sensemaking, is retrospective; it occurs after something has been noticed in order to form future action (Starbuck and Milliken, 1988; Weick, 1995; Weick et al., 2005).

METHODOLOGY

A mixed methods approach consisting of two distinct but related phases: 1) in-depth case studies and 2) experiments, is proposed to answer the research questions and test the four different perspectives.

In-Depth Case Studies

The first phase of this research study uses the case method in order to examine the above research questions, and to learn more about the phenomenon of interest, and thus, generate theory (Eisenhardt, 1989). The scarce research on IS post-adoptive behaviors suggest that the use of a case study is appropriate (Yin, 1994).

These case studies will encompass videotaped observations, recorded interviews, and a questionnaire with employees in organizations where the use of IS is mandatory. The samples will include employees of companies that use IS differently and thus, show different patterns of behaviors with the IS at hand (i.e., places where interruptions are nonpervasive/pervasive, etc.). This will allow for the examination of the proposed process models in different situations, encompassing everyday use of IT, as well as naturally occurring interventions (i.e., errors, etc). Research on psychology and physiology indicates how facial expressions have representational functionality that reflect affect (Ekman, 1982; Ekman, Friesen and Ellsworth, 1972; Ekman and Rosenberg, 1997; Izard, 1971; Zajonac, 1980; Zajonac and Markus, 1984), thus changes in facial expressions will be coded. Second, interviews with users will be held and audiotaped immediately after the observations in order to minimize disruptions to their natural behaviors and retrospective bias. The interviews will encompass non leading open-ended questions about users' emotion and cognition at the moment of IS use. If natural interventions occur, questions about these interventions will be also asked. Third, after the interviews, the users will be asked to fill out a questionnaire capturing the constructs in the traditional perspective.

Experiments

After the case studies, more constrained experiments will be designed to compensate for the limits of observation of the previous method. These experiments will allow for a more accurate examination of certain models in specific situations. In the experiments, the naturally occurring interventions observed in the case studies can be further investigated in a more controlled way (Jarvenpaa, Dickson and Desantis, 1985). A naturally occurring intervention, for example, could happen when an error in the IS occurs. This will allow for an examination of whether (and how) the user is capable of coping with the situation and what assumptions and behaviors about the IS in use he/she needs to modify when trying to accomplish the task.

Although the experimental design may change as a result of the conclusions drawn from the case studies, it is expected to be the following. Three different groups of users interacting with a familiar IS will take part. The users will be assigned to the three groups in which interruptions while using the system will be manipulated randomly (no interruptions, temporal

interruptions, and pervasive interruptions) and I will control for users' previous experience with the system. The users' interactions with the IS will be videotaped and their keystrokes recorded for further analysis. These recordings will be analyzed in the same manner as it was done with the case study. For example, facial expressions will be analyzed. Furthermore, the users will be wearing some electrical devices that will measure their brain activity as well as physiological changes in order to capture emotion and cognition (Marshall, Pleydell-Pearce and Dickson, 2003). These measures of emotion and cognition will provide the hard data to disentangle emotion and cognition during IS use. At the end of the experiment, an interview on users' cognitions and emotions will be held. Finally, like in the case study, a TAM type questionnaire will be filled by the users at the end of the study.

ANTICIPATED CONTRIBUTIONS AND IMPORTANCE OF RESEARCH

This research will make contributions to the theory of IS and IS practice. First, it goes beyond TAM to consider other theoretical perspectives in IS post-adoptive behaviors from disparate areas (i.e., psychology, physiology, etc) that will enrich our understanding of the phenomena. This contributes to the IS field by keeping the conceptualization of post-adoptive behavior open to new theoretical influences. Second, IS use is conceptualized as an ongoing activity that takes into consideration the situation, context, and task to be accomplished. Instead of treating IS use as dichotomous variable (i.e., use vs. lack of use) (Davis, 1989; Davis et al., 1989), or studying intention to continue using the system' as the IS dependent variable (Limayen et al., forthcoming), use is conceptualized as an ongoing activity that needs to be carefully observed in its situated context. Third, two of the alternative perspectives, ecological psychology and the affect-object paradigm, suggest a possible causal role for the IT artifact (in relation to individual capabilities) in IS post-adoptive behavior. This provides a starting point from which to begin the theorization of the IT artifact in to the IS field. Finally, because of the richness of the intended observations this thesis will bring IS research closer to the practitioner. By providing an understanding of users' post-adoptive behaviors with IS, this research will provide guidelines for the development of training, the introduction of new features and changes in current IS, and the motivation of users. Finally, from an empirical standpoint, the use of different sources of data (i.e., interviews, observations, physiological changes) is necessary since past research has pointed to a mono-method bias in the study of IS use (Sharma et al. 2004; Straub et al. 1995). Furthermore, cognition and emotion may happen without the individual being conscious of them (Bargh 2002) and thus, just asking the individual about them is not enough.

After twenty years of research on IS use and users' behaviors with IS, our understanding of the phenomenon is still quite limited (Markus, 2005). By introducing new theoretical perspectives and innovative research methods, it is hoped that this thesis will provide a richer and original understanding of individuals' behaviors with IS as well as new exciting and fruitful options for future research.

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