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The Role of Habit and the Changing Nature of the Relationship Between Intention and Usage

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THE ROLE OF HABIT AND THE CHANGING NATURE OF THE RELATIONSHIP BETWEEN INTENTION AND USAGE

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Abstract

The purpose of this study is to investigate the changing nature of the relationship between intention and usage over time. Our main argument is that as individuals get into the habit of continuously using a system, the predictive power of intention will be diluted. Consequently, the more usage is performed out of habit, the less cognitive planning is involved. In other words, as habit of using an IS increases, the relationship between intention and usage weakens. This paper describes the theory bases, the research method, as well as the potential contribution of this work-in-progress.

Keywords: IS continuance, habit, intention, usage, longitudinal study, theory of reasoned action, technology acceptance model, theory of planned behaviour

1   INTRODUCTION

Information systems (IS) adoption is just the first step toward overall IS success. An IS implementation can truly be considered as "a success" when a significant number of users have moved beyond initial adoption and used the information systems on a continued basis (Bhattacherjee 2001, Davis and Venkatesh 2004, Limayem and Hirt 2003). Bhattacherjee (2001) was one of the very first researchers proposed an IS continuance model in line with the expectation confirmation theory. His IS continuance model seeks to explain an IS user's intention to continue using an IS. Bhattacherjee's (2001) investigation stopped at intention, without assessing IS continuance, and his model assumed that IS continued usage is primarily determined by intention. Though this assumption has been validated in past IS research on IS adoption, it may not explain IS continuance usage equally well in the case of IS post-adoption. As Quelette and Wood (1998) urged, frequently performed behaviors tend to become habitual and thus automatic over time. People's baseline response to many situations related to continued IS usage may not be predominantly determined by intentional behavior, but rather be the result of habitual behavior. Thus, there is a need to understand the role of habit and its impact on the relationship between intention and usage over time.

As a step toward bridging the gap, the purpose of this study is to examine the role of habit and the changing relationship between intention and usage over time. This paper is structured as follows. We first provide the theoretical background of this study by reviewing the literature on intention-based models, IS continuance model, and habit. Building on this review, we introduce our research model. We then describe the research method and conclude the paper by highlighting the expected contributions to both research and practice.

2   THEORETICAL BACKGROUND

In this section, we first provide an overview of intention-based models and IS continuance model. Then, we discuss the role of habit and its impact on the relationship between intention and usage over time.

2.1   Intention-based Models

In the past two decades of IS usage research, there has been a predominant focus on cognitive behavioral models, including the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM) and its variants. IS researchers have adapted intention-based models from social psychology as a theoretical foundation for research on the determinants of user behavior.

2.1.1   Theory of Reasoned Action (TRA)

TRA (Fishbein and Ajzens 1975) assumes that one's intentions capture the motivational factors that influence one's behavior. Intention, in turn, is formed by two factors: (1) one's attitude which reflects feelings of favourableness or unfavorableness twoards performing a behavior, and (2) the subjective norm which reflects the significant influence of other referents' desire for the individual to perform or not to perform a behavior. An indivdual's attitude is further described as the summation of the strength of each salient belief multiplied with the subjective evaluation of the belief's attribute. Subjective norm, similarly, is considered the summation of the strength of each normative belief multiplied with the person's motivation to comply with the referent in question.

2.1.2   *Theory of Planned Behaviour (TPB)*

Applying this model to the study of IS adoption, IS usage behavior is predominantly explained by behavioral intention. Intention, in turn, is formed by attitudinal beliefs and social normative influences. Subsequent research has paid considerable efforts on extending the TRA model to explain other contextual and research concerns. With the various modifications and extensions of additional variables, the concept of perceived behavioral control, as proposed by Fishbein and Ajzen (1975) was widely recognized, and led to the development of the Theory of Planned Behavior (TPB) (shown in Figure 1). According to Ajzen (1991), the more resources and opportunities individuals think they possess, the greater would be their perceived control over their behavior, and therefore, the greater the likelihood for these individuals to behave accordingly.

2.1.3   *Technology Acceptance Model (TAM)*

Research in this area has explored very thoroughly the many antecedents and moderating effects leading to the initial acceptance of a particular IS. Among the intention-based models, TAM is considered as the most parsimonious and powerful theory for describing user acceptance of information systems (Lee et al. 2003, Venkatesh and Davis 2000). Detailed discussion on TAM in IS research can be found in Lee et al. (2003) and Legris et al. (2003). According to the TAM, IS usage behavior is predominantly explained by behavioral intention. Behavioral intention, in turn, is determined by attitude toward usage, as well as the direct and indirect effects of perceived usefulness and perceived ease of use. Both perceived usefulness and perceived ease of use jointly affect attitude, whilst perceived ease of use has a direct impact on perceived usefulness.

2.2   IS Continuance Model

In recent years, researchers have started to advocate the need to understand the continued IS usage behavior (Bhattacherjee 2001, Davis and Venkatesh 2004, Limayem and Hirt 2003). IS continuance describes behavior patterns reflecting continued use of a particular IS. Continuance refers to a form of post-adoption behavior. Although the term "post-adoption" actually refers to a suite of behaviors that follow initial acceptance (Rogers 1995), including continuance, routinization, infusion, adaptation, assimilation, etc., in the literature it is often used as a synonym for continuance (cf. Karahanna et al. 1999). In this study, we limit ourselves to the terms IS continuance or continued IS usage behavior. Bhattacherjee's (2001) "Post-acceptance model of IS continuance" seeks to explain an IS user's intention to continue using an IS. Based on expectation-confirmation theory, IS continuance intention is predominantly determined by satisfaction and perceived usefulness. In the marketing literature, satisfaction is considered key to building and retaining a loyal base of long-term consumers. A similar argument can be made in the context of IS continuance where satisfaction with an IS tends to reinforce a user's intention to continue using the system. By including perceived usefulness, Bhattacherjee's (2001) model reflects current thinking in the area of IS which holds that perceived usefulness is the only construct consistently influencing user intention across both adoption and post-adoption phases. The model also relates satisfaction and perceived usefulness to the degree with which the user's expectations about the IS are confirmed. Expectation provides the baseline level against which confirmation is assessed by users to determine their evaluative response or satisfaction. The better they are met, the more useful it appears to users and the more satisfied they are.

2.3   Habit

Habit has been a core research topic of numerous studies from diverse theoretical perspectives. Across disciplines, habits are commonly understood as "learned sequences of acts that become automatic responses to specific situations which may be functional in obtaining certain goals or end states" (Verplanken et al. 1997, p.540). Although Ajzen (2002) has suggested that intention is the main causal

mechanism behind the enactment of behavior (habitual or otherwise), the literature on habit maintains that the automaticity of behavior lessens the need to access intention (cf. Aarts et al. 1997). Recently, Verplanken et al. (1998) have noted that "when a behavior is repeatedly and satisfactorily executed and becomes habitual, [..], it may lose its reasoned character." Such an interaction was also indicated in Triandis' (1980) model of attitude-behavior relationships, where intentions are assumed to predict behavior to the extent that the habit component is weak, or to a lesser degree, when habit is strong. In this study, we used Limayem et al.'s (2003) definition of habit and defined IS habit as *the extent to which using a particular IS has become automatic in response to certain situations.*

3   RESEARCH MODEL

Figure 1 depicts the research model for explaining the role of habit and its impact on the relationship between intention and IS usages over time.
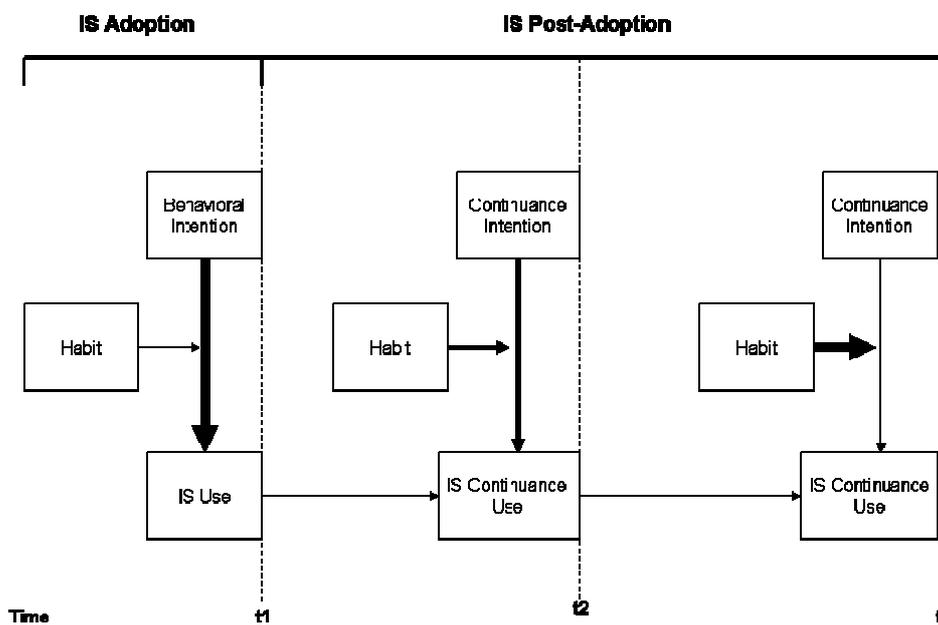

Figure 1.   Research Model

3.1   The Impact of Habit on the Relationship between Intention and IS Usage

Our argument is that if a person is in the habit of continuously using an IS, there would seem to be no need to peform the conscious planning (c.f. Trafimow 2000, Saba et al., 1998, Ouelette and Wood 1998, Tyre and Orlikowski 1994) assumed by any of the intentional behavior models discussed in the previous section. Supporting this line of reasoning, Aarts et al. (1998, p. 1364) found that habit strength attenuates the amount of information acquired and utilized before the decision is made. We therefore argue that if individuals are in the habit of using a particular system, the predictive power of intentions is attenuated. In other words, the stronger the habit, the weaker the effect of intentions on continuous usage. Verplanken et al. (1998) obtained a stronger intention-behavior relation for people who were not in the habit of performing the behavior than for people who were in the habit of performing the behavior. Put differently, habit and intention significantly interacted in the prediction of continuous IS usage. While habit in the behavioral domain increased in strength, intentions became less predictive of IS continuance.

Given the range of arguments as presented above, we adopt the moderation perspective for the research reported in this paper. Consequently, we summarize the conceptual relationship between intention and habit as follows. If individuals are habitually performing a particular behavior (for example, using a particular IS), the predictive power of intention is weakened. Thus, the more a behavior is performed out of habit, the less cognitive planning it involves. Applied to continued usage, this means that IS habit exerts a moderating (suppressing) effect on the relationship between intention and actual continued usage. Thus, we have the following hypotheses:

H1: The moderating role of habit increases over time.

H2: The relationship between intention and usage weakens over time.

3.2 The Role of Prior Behaviour

Prior behavior has been one of the core research topics of many studies in the psychology and marketing domain (e.g. Bentler and Speckart 1979, Bagozzi 1981, Bagozzi and Warshaw 1990, Fredricks and Dossett 1983, Norman and Smith 1995). Ajzen (1991) argued that prior behavior could be used to test the sufficiency of any model designed to predict future behavior under the assumption of stable determinants. Bentler and Speckart (1979) proposed that a model that includes a direct path from prior behavior to later behavior provided a significantly better fit to the data than the theory of reasoned action. Davis and Venkatesh (2004) found that users' direct hands-on experience is the key driver of their sustained usage. They empirically showed that when they included the construct "prior usage behavior" as an additional antecedent of IS continuance behavior, all other determinants in the TAM become insignificant. Along with other researchers, we agree with Davis and Venkatesh's (2004) assertion that prior behavior is the most important antecedent in predicting future behavior (Bagozzi and Kimmel 1995, Conner and Armitage 1998, Norman and Smith 1995). Therefore, we hypothesize that initial usage has significant impact on IS continuance usage.

H3: Initial usage has significant impact on IS continuance usage..

4 RESEARCH METHOD

Our focus is on the role of habit and the changing nature of the relationship between intention and IS usage over time. The system used in this study is "Blackboard Learning System (www.blackboard.com)." It is a Web-based server software platform that offers industry-leading course management, an open architecture for customization and interoperability, and a scalable design that allows for integration with student information systems and authentication protocols. Blackboard is adopted as a teaching platform of several courses provided by a local university. Students can login to the system to download lecture notes, share documents with their project teammates, and communicate with their fellow students and course instructors. First year students are chosen as our research subjects, since they have no prior knowledge of the system, making it relevant to study adoption as well as continuance. The usage of this system is entirely voluntary and students can use other means to download and upload materials and to communicate with their instructor and classmates. In other words, students are not penalized for not using this system. The sections below describe a detailed plan for data collection procedure, measurement and data analysis.

4.1 Data Collection Procedure

The study is currently being conducted. The sample is a group of 502 Year 1 students, who have no initial experience with the use of Blackboard. Participation in this study is voluntary. In order to encourage participation, an incentive is given to each of the participants in the form of bookstore cash coupons. Recruitment was carried out in the first week of the semester. All participants received a two-hour training session in Week 2 on the basic functions of Blackboard. The data collection

involves four rounds: immediately after the initial training (t_1) and every four weeks after the initial training (t_2, t_3, and t_4) (See Figure 2). Participants are invited to answer an online survey assessing their intention, habit, and usage. Detailed system logs are also used to measure their usage across time.
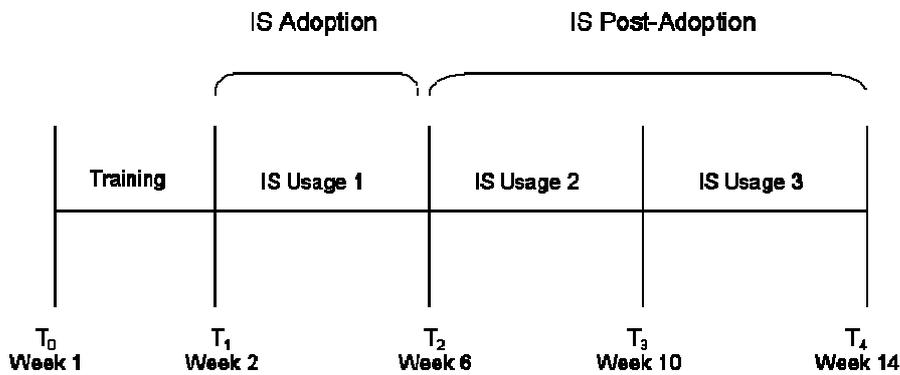

Figure 2.   Data Collection Procedure

4.2 Measurement

Table 1 lists the measures used in this research. We use items that had been validated by prior research, but modified the wording of the questionnaire in order to fit this particular context of Blackboard usage. Behavioral intention is measured using Davis (1989) and Taylor and Todd (1995). IS continuance intention is adapted from Bhattacherjee (2001). Habit is assessed using the measures from Limayem et al. (2003). The formative items measuring initial usage and IS continuance are taken from Davis (1989) and Steinfield (1985).

Constructs	Measures	Sources
Behavioral Intention		
BI1	I will use Blackboard during the next four weeks.	Taylor and Todd
BI2	I intend to use Blackboard during the next four weeks.	(1995)
BI3	I intend to use Blackboard frequently during the next four weeks.	
BI4	All things considered, I expect to use Blackboard during the next four weeks.	
Continuance Intention		
CI1	If I could, I would like to continue my use of Blackboard.	Bhattacherjee (2001)
CI2	All things considered, I expect to continue using Blackboard during the next four weeks.	
CI3	All things considered, it is likely that I will continue to use Blackboard during the next four weeks.	
Habit		
HABIT1	I use Blackboard as a matter of habit.	Limayem et al.
HABIT2	Using Blackboard has become automatic to me.	(2003)
HABIT3	Using Blackboard is natural to me.	
HABIT4	When faced with a particular task, using Blackboard is an obvious choice for me.	
HABIT5	Using Blackboard has become a habit to me.	
HABIT6	It is a habit of mine to use Blackboard.	
Initial Usage/ Continuance Usage		
IU1/CU1	How often did you use Blackboard during the last 4 weeks? (Never/Always)	Steinfield (1985)
IU2/CU2	(Once a month/Once a day)	Davis (1989)

Table 1. List of Measures

4.3 Data Analysis

The analysis of the data will be done in a holistic manner using Partial Least Squares (PLS). The PLS procedure (Wold 1989) has been gaining interest and use among researchers in recent years because of

its ability to model latent constructs under conditions of non-normality and small to medium sample sizes (Chin 1998, Chin and Gopal 1995, Compeau and Higgins 1995). It allows one to both specify the relationships among the conceptual factors of interest and the measures underlying each construct, resulting in a simultaneous analysis of 1) how well the measures relate to each construct and 2) whether the hypothesized relationships at the theoretical level are empirically true. This ability to include multiple measures for each construct also provides more accurate estimates of the paths among constructs which are typically biased downward by measurement error when using techniques such as multiple regression. Furthermore, due to the formative nature of some of the measures used and non-normality of the data, LISREL analysis was not appropriate (Chin and Gopal 1995). Thus, we choose PLS Graph Version 3.00 (Chin 1994) to perform the analysis.

5   EXPECTED CONTRIBUTIONS

At the time of writing this paper, we have collected data at the IS adoption stage, and the first set of data at the post-adoption stage. We believe that at the time of the conference, we are able to present the findings of this study.

This paper investigates the role of habit and the changing nature of the relationship between intention and IS usage over time. The proposed model is being tested in a longitudinal setting. We expect this study presents important theoretical and practical contributions. On the theoretical side, this research highlights the evolution of IS usage by integrating the habit construct with intention-based models to explain IS usage across time. Specifically, we synthesize research on habit taken from other disciplines and extend existing theories by proposing habit to moderate the relationship between intention and IS usage.

While this study contributes to research by refining existing work on IS continuance through theory extension, it is relevant for practitioners as well. Both the introduction of new systems (e.g., e-business applications, CRM, ERP), and the removal of old ones (legacy systems) frequently raise questions about how to deal with lower than expected or declining continuous usage and unwanted habitual usage of out-dated systems. We believe that management may benefit considerably from understanding the nature of habit and its relationship with intention and usage when faced with situations that call for the promotion of certain IS related behaviors. In situations where it is likely that users have acquired IS habits, it might be useful to assess the habit strength of each individual prior to designing any specific measures to change or reinforce certain behaviors. For instances, training or other measures could be tailored to the users' respective level of IS habit. This way one would avoid the pitfall of trying in vain to persuade habitual users to change their behavior despite the fact that they do not consciously control their current behavior.

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