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To Adopt or Not to Adopt - That is the Question

Rhoda C. Joseph
Pennsylvania State University - Harrisburg, ruj1@psu.edu

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Rhoda C. Joseph
School of Business Administration
Pennsylvania State University Harrisburg
777 West Harrisburg Pike
Middletown PA 17057
ruj1@psu.edu

ABSTRACT

The area of adoption and diffusion has had a strong pro-innovation bias (Brancheau and Wetherbe 1990; Parthasarathy and Bhattacherjee 1998; Ram 1987; Venkatesh and Brown 2001). This bias has resulted in somewhat of a neglect of the area of non-adoption. Existing theories including TAM (Davis 1989) and the innovation diffusion theory (Rogers 1983) provide critical insights into technology usage. However, the factors that facilitate technology adoption are not necessarily the same as those affecting non-adoption. This paper examines the non-adoption phenomenon and presents the case that the category of non-adopts refers to a complex subset of individuals. Characterizing resistance as either active or passive provides a framework for further analysis into the non-adoption phenomenon. Ultimately, the issue of non-adoption is just as critical as that of adoption.

KEYWORDS: innovation, technology adoption, resistance.

INTRODUCTION

The major motivation for this paper is to examine the area of technology non-adoption. Adoption by far is a more positive and attractive area to study. However, non-adoption is a fact that many technologies face in their lifetime. This paper first discusses information technology innovations, and is followed by innovation adoption and resistance. Thirdly, a synthesis is presented that proposes a bi-polar categorization of resistance – applicable to the area of information systems and information technology. The paper concludes with the merits of the proposed classification and future research that needs to be implemented to validate the proposal.

INFORMATION TECHNOLOGY (IT) INNOVATIONS

In the most generic sense an IT innovation can be a product, practice or process. An IT innovation is described as one that relies extensively on technological advances such as computer hardware, computer software and telecommunications (Dekimpe, Parker and Sarvary 2000). The adoption and diffusion of IT innovations is of interest to both researches and practitioners in the Information Systems (IS) community. The uniqueness of information technology necessitates the development of a distinct IT diffusion theory (Prescott and Conger 1995).

IT innovations can occur in a networked or non-networked environment. The networked environment is positively affected by the existence of network externalities. Network externalities occur where the technology is perceived as more useful and beneficial to the user as more individuals adopt the technology. For example, when examining the adoption and diffusion of Electronic Data Interchange (EDI) - a networked technology, four sets of factors are considered: IT context, operational concerns, network externalities and exogenous factors (Bendoly and Kaefere 2003). With EDI technology, value to the individual user is increased as other users adopt the technology. For non-networked technologies such as personal computers, network externalities will not be as significant a factor.

Irrespective of whether an IT innovation occurs in a networked or non-networked environment it presents a unique classification for innovations. IT innovations represent a dynamic and evolving class of innovations. One of the main drivers for the rapid diffusion of IT technology is the exponential growth of computing power. In fact, it has been found that computer power doubles approximately every 18 months (Laudon and Laudon 2004).

The personal computer is a unique information technology innovation since it can exist in both networked and non-networked environments. The personal computer has had a significant impact on human behavior and is described as one of

the clearest examples of a discontinuous innovation (Robertson 1967). The personal computer is used as an illustration to support the primary assertion of this paper – all individuals in a target population do not adopt an innovation, and arguably the group of non-adopters is not a homogenous subset of the population.

The 1980s saw the beginning of PCs in homes across America. In 1993 approximately one third of American homes had PCs, however by 1999 the number of homes with PCs was still approximately one third of American homes (Venkatesh et al. 2001). The personal computer (PC) in homes sets the stage for the adoption of the world-wide-web and the plethora of ideas and products that followed.

This statistic is very interesting for two main reasons. The first is that computer companies such as Dell Microsoft, IBM and Apple were showing record sales during that period, yet the number of households with PCs remained relatively fixed. Since IBM introduced its first PC in 1981, a plethora of innovations have followed to support the computer industry (Prescott et al. 1995).

The second reason why the above statistic was interesting is that more than 66% of American households had not purchased a PC in spite of all the benefits and advantages that can be derived from the use of this innovation. A recent study indicated that age, income and technological complexity were significant barriers to PC adoption (Wei 2001). Of course, because of factors such as multiple-computer households the number of computer users has increased.

The non-movement of the number of adopters of PCs in the home suggests some level of stagnation (Venkatesh et al. 2001). However, (Venkatesh et al. 2001) do not elaborate on the cause or implications of stagnation. One plausible cause, outside of the existing literature is indifference to the technology. A logical deduction regarding PCs in 1999 would be that the majority of American households would have heard about them. However, with only one third penetration in households, inertia can be one plausible explanation.

Explicit data supports the case that there is a correlation between household income and PC adoption. In 1989, 40 percent of homes with annual income over $50,000 owned PCs, while only 5 percent of homes with income below $15,000 owned PCs (Higgins and Shanklin 1992). The PC provides the window to access to the World Wide Web. Public institutions such as schools and libraries provide alternate access opportunities. However, the examination of innovations spawned from the World Wide Web, excludes a large portion of the population who do not even possess basic PC skills.

One of the main distinguishing features of web-based IT innovations, as opposed to innovations in other fields is the precursor that exists. The World Wide Web is itself an innovation that has revolutionized economic, social and political domains. The use of the World Wide Web has grown exponentially (Rai, Ravichandran and Samaddar 1998) and it has given birth to a plethora of other innovations. The examination of innovations, within an innovation itself presents a unique case for the examination of diffusion theory.

One of the unique characteristics of web-based innovations that distinguish them from any other is the range of diverse products that are available. Innovations that are web-based can be categorized as continuous, discontinuous or dynamically continuous innovations. The popularity of the web, low investment costs and potential benefits makes the web particularly attractive for most businesses and organizations to disseminate their products and/or innovations (Nambisan and Wang 1999). The variety and accessibility that the web provides makes it appealing at both the producer and consumer levels.

The World Wide Web, which itself an innovation (Molesworth and Suortti 2001), has given birth to many other innovations. Examples of these innovations include but are not limited to on-line banking, on-line trading and purchases to down loading music and videos on-line.

The target of many of these innovations is the base of individual users. However, a lot still needs to be learnt about the adoption patterns of these innovations that are embedded into the larger innovation of the World-Wide-Web. This research attempts to broaden theory and understanding in this area.

IT INNOVATIONS AND ADOPTION

The adoption of several different IT innovations has been examined in the literature – including smart cards (Plouffe, Hulland and Vandenbosch 2001), Electronic Data Interchange (EDI) (Bendoly et al. 2003). The area of IT innovations that exist because of the Internet and web-based technologies is a fast growing area with varying degrees of adoption and resistance.

The IT adoption literature has used "intention to adopt" as a reasonable proxy for actual adoption behavior and continued use of a technology (Plouffe et al. 2001). This is a very useful practice, since in many studies, actual behavior is the variable of interest, but is difficult to actually measure. A more amorphous construct to measure is "intention not to adopt". Further, is "intention not to adopt" a reasonable proxy for non-adoption behavior? These types of questions drive the need for further examination of the non-adoption phenomenon.

IT innovations are complex and content-sensitive and thus no single theory has been found to completely explain the IT innovation phenomenon (Carter Jr., Jambulingam, Gupta and Melone 2001). The approach that has been used to study IT innovations, looks at each innovation or a related set of innovations separately. One approach that can be used to address the variability found in IT innovations is to classify them by identification of their set of unique characteristics.

One area where IT innovations differ from innovations in other fields is during the innovation development process. There is support for the case that the time to market of IT innovations is shorter than that of other innovations. This can be attributed to shorter product cycles and/or shorter product life span. This fundamental difference adds further support for looking at IT innovations separately.

The technology acceptance model - TAM (Davis 1989) examined the relationship of user perceived ease of use and user perceived usefulness as determinants for the probability of system use. TAM consistently explains about 40% of the variance associated with usage intentions and behavior (Venkatesh and Davis 2000a). Further, the original TAM model was later revised to include subjective norms and tested longitudinally and defined as TAM2 (Venkatesh et al. 2000a).

TAM (Davis 1989; Venkatesh et al. 2000a) and Perceived Characteristics of an Innovating - PCI (Moore and Benbasat 1991) have both been used to better understand the antecedents of technology adoption. Both models are highly intuitive, reliable and have high predictive power – and in many instances can be used interchangeably (Plouffe et al. 2001). The parsimony of TAM has facilitated is popularity, however PCI significantly outperformed TAM when predicting merchants' adoption intentions of a new smart card system (Plouffe et al. 2001).

TAM has been tested with other constructs to further explain users intentions and behaviors: TAM with trust and risk for e-commerce acceptance (Pavlou 2003); TAM with flow theory to explain consumer behavior on the web (Koufaris 2002); TAM with motivation and emotion (Venkatesh 2000). Extensive empirical support for the TAM constructs has been found (Adams and Nelson 1992; Chin and Todd 1995; Davis, Bagozzi and Warshaw 1989; Gefen and Straub 1997; Klaus, Gyires and Wen 2003; Taylor and Todd 1995; Venkatesh and Morris 2000b).

One underlying theme of TAM is that it captures user perceptions. When perceptions are excluded**,** ease of use and usefulness are informational constructs. Information on these constructs can be derived from different sources including manufacturers, independent reviews, consumer groups and peers.

INNOVATION RESISTANCE

This paper adopts the nomenclature of adopters and non-adopter to describe the pool of individuals in the target population of the innovation. The different adopter categorizes are: innovators, early adopters, early majority, late majority and laggards (Rogers 1995). Innovators are the first to adopt and the laggards do so at a later point in time. The inherent assumption in this categorization is that at some point in time, all the members of the social system being examined will become adopters. There is some question as to the generality and accuracy of this assumption (Robertson 1967). The non-adopter is ignored in this model.

An innovation is generally directed to a target population of users. At any instance in time after the introduction of the innovation, there will be individuals of the target population that have adopted the innovation (adopters) or that have not adopted the innovation (non-adopters). The literature has identified two categories of non-adopters: explicit rejectors and postponers (Gatignon and Robertson 1989; Szmigin and Foxall 1998). Explicit rejection is an active process, where the

individual has decided against the innovation. Postponment is also an active process where user has delayed the adoption process.

Admittedly, a third more passive state can exist where the user is seemingly indifferent to information about the innovation. This conceptualization will be referred to as the Indifferent Group (IG). Thus, the case presented here, is the possible existence of three categories of non-adopters: rejectors, postponers and the IG. The last group can move to explicit rejection, explicit adoption or remain in that state.

Change is inevitable but it is a phenomenon that can be severely resisted. In fact individuals seem to have a natural disposition to resist change and maintain the current status quo (Ram 1987). In some work and social settings individuals can be under significant pressure to resist change and conform to the group norms.

An innovation can face a high degree of resistance if it causes significant disruptions in the normal behavior patterns of users (Ram 1987). When an innovation is resisted, it is viewed as a shortcoming of the potential adopter who is further labeled a "laggard" (Rogers 1995). The laggard is a synonym for postponer that has been mentioned above. These terms do not carry positive connotations and seem to ascribe blame to the potential adopter rather than on attributes of the innovation. It is important to move beyond the negative projections of such individuals and examine more critically the larger class of non-adopters that include not only explicit rejectors and postponers but those that are truly undecided.

Many perceived barriers exist that retard the individual from the adoption of an innovation. Two main sources of resistance to innovations exist: functional barriers and psychological barriers (Ram and Sheth 1989). Functional barriers (Ram et al. 1989) refer to perceived changes that will result from the use of the innovation and include: usage barriers – the innovation is not compatible with the user's existing habits; value barriers – the cost of adopting the innovation exceeds the expected benefits; risk barriers – the user needs to be able to mitigate the physical, economic, functional (performance), social risks that are associated with the use of the innovation.

The second source of resistance – psychological barriers (Ram et al. 1989) refer to the perceived conflicts with the user's prior beliefs that will result from the use of the innovation and include: tradition barriers – the use of the innovation will cause the user to regress from established social, religious, institutionalized traditions; image barriers – the origins and identity of the innovation is viewed negatively by the user, and its use will be resisted.

These barriers provide a compelling basis to better understand why users resist innovations even though (Ram et al. 1989) did not explicitly test these constructs. Gradual integration, government mandates and education (Ram et al. 1989) are all proposed strategies to help reduce innovation resistance. Empirical tests about sources of resistance can provide further support for some of the assertions made by Ram et al (1989).

Ram et al. (1989) argue that innovation resistance is not the inverse of innovation adoption but instead is the antecedent to adoption. The reasoning to support the argument is that an individual must first overcome resistance before adoption to occur. Theoretically, there will be varying degrees of innovation resistance. If the degree of innovation resistance lies on a continuum from zero to one, then resistance of zero will coincide with adoption and resistance of one will coincide with explicit rejection. An intermediate undecided state will lie between zero and one.

In addition to examining the antecedents to innovation resistance, other researchers have studied different types of innovation resistance (Gatignon et al. 1989; Szmigin et al. 1998). Three types of innovation resistance are identified in the literature: rejection, postponement and opposition (Gatignon et al. 1989; Szmigin et al. 1998). The boundaries across these three categories are somewhat blurred. The examination of innovation resistance is as significant as the examination of innovation adoption because they represent the poles bounding the results of the diffusion of an innovation.

Rejection occurs when an individual has processed the available information and decided that they will not use the innovation (Szmigin et al. 1998). The individual is thus an *active* rejecter of the innovation.

The second type of resistance: postponement, occurs when the individual has decided to delay the adoption of the innovation (Gatignon et al. 1989). A postponer is a type of non-adopter. The postponer is in an active state, waiting for his/her perceived best time to adopt the innovation.

The third type of innovation resistance categorized in the literature is innovation opposition. This occurs when the potential adopter actually tests the innovation but ultimately rejects it (Szmigin et al. 1998). This can be further characterized as discontinuance of the innovation (Parthasarathy et al. 1998). This type of resistance is also an active decision by the user.

Szmigin et al (1998) examined the use of innovative payment methods, such as credit card, debit card, store card in a purchase transaction and concluded that innovation resistance is based on both situational and psychological factors. Situational and psychological factors represent very broad categories but provide directions as to what to examine when trying to find root causes for innovation resistance. It also provides a basis for the further examination of the characteristics, attitudes and behaviors of non-adopters.

One of the challenges with clearly identifying innovation resistance is that it is not always observable (Midgley and Dowling 1978). Clearly distinguishing the different types of innovation resistance can provide an opportunity for better understanding, since resistance is a multi-faceted resister phenomenon.

ACTIVE VS PASSIVE FRAMEWORK

This paper theorizes that only two true forms of resistance exist – passive and active. Active resistance has been described above under the description of rejection, postponement and opposition. In fact, the types of resistance that has been identified in the existing literature, all seem to be active decisions executed by the potential adopter. The individual makes a conscious decision not to adopt an innovation.

However, passive resistance to information technology is much more subtle. This paper proposes that a passive group of resisters exist. Consequently there is a third option in the innovation diffusion model (Rogers 1995): adoption, rejection, indifference. One underlying assumption is that decision-making in the innovation adoption process is somewhat of an iterative process (Xia and Lee 2000). This iterative process indicates that a user may at first be in the state of inertia but then move to explicit adoption or active resistance.

CONCLUSION

This paper examines the literature surrounding innovation resistance. This area of study has important implications for researchers and practitioners. The focus on adoption of technology has exponentially outpaced research on non-adoption. This paper argues that non-adoption is not simply a factor of being a laggard or uninformed. There is a consideration for an alternative explanation that suggests that individuals may be exhibiting passive resistance. To adopt or not to adopt an innovation moves away from a stigmatization of non-adopters and presents the notion that all non-adopters are not necessarily equal.

These ideas must be further examined empirically with a clear set of defined constructs for identification of this passive state. It is also critical to further explain how this state is truly different from any other resistance that has been identified in the literature. There are implications for theory in emerging areas such as electronic government and e-commerce. Understanding the behavior of non-adopters can ultimately affect adoption and the entire diffusion process.

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