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Review of Technology Acceptance Model Electronic Commerce Adoption: A Conceptual Framework

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Abstract – Technology has become integrated component of the business. All the stakeholders, executives and the researchers are trying to understand the online buying behavior of the consumers. E-commerce has become the viable means of conducting business activities. The acceptance of technology by the consumer has been an important field of study for almost over four decade. One model which is attracted the researchers worldwide is technology acceptance model. Anyone willing to understand the intentions of acceptance of E-commerce has to understand the technology acceptance model (TAM). The review of TAM can give a clear understanding to the researchers to determine the underlying component resulting into redefining and restructuring the model to be more effective and efficient in establishing the model. In this paper 20 publications on the E-commerce are reviewed. The author reviewed these studies to establish the applicability of TAM. The observations conclude that though the TAM is exceedingly cited model but the researchers have mixed opinion about its theoretical assumption and its actual effectiveness. It is concluded that TAM lack sufficient explanation and relevance to make it a well-established theory for the E- commerce community.

Keywords: Technology, TAM, Adoption, E-Commerce, Intention

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INTRODUCTION

E-commerce is a general term for any type of business, or commercial where electronic transaction that involves the transfer of information across the stakeholders through internet. Hence, we can state that E-commerce is known as the use of computers and electronic networks to run business with other business and other consumers over the internet or another electronics network. The India's online retail sales are estimated to reach $68 billion by 2020 growing at 5year CAGR of 31.2 percent as reported by Forester Research (Mulpuru, 2011) resulting into the economic impact of E-commerce is increasing many fold. Online companies, web based companies, Net enabled organizations and scholars are still trying to establish and predict online consumer behavior which has increased the need of the research in this area.

Researchers have explored online buying behavior in terms of E-commerce acceptance (Bhattachrjee, 2001; Gefen, Karahanna, & Straub, 2003b; Gefen & straub; 2000;Koch, Toker, and brulez,2011; Koufaris, 2002). Studies that propose theoretical frameworks and provide empirical findings for the respective theoretical framework have collected (Ajzen & Fishbein, 1980; Davis, Bagozzi, & Warshaw, 1989; Mathieson, 1991; Thompson, Higgins, & Howell, 1991). Among the models, TAM has been accepted as the most robust, prudent, and dominant. The most widely refered model in E-commerce research is Davis's (1989) technology acceptance model (TAM) (Gefen & Straub, 2000). This paper therefore examines the historical evolution of TAM in the E-commerce literature from 1985 to 2016, focusing on its historical origin, and some of its major application; validation, extensions and criticism. Findings from a selected no. of articles published on TAM are thus, summarized and organized as follows.

THEORETICAL FRAMEWORK

Innovation diffusion and appropriation has been extensively studied. A ample range of studies has been done to explain the aspect, speed or pattern of diffusion. Diffusion theories have also been developed in various field encompassing information systems (IS), management, economics, sociology, marketing, and medicine. Diffusion research has been concerned with many issues. Innovation

diffusion in information systems has been one of the most commonly studied issues in all of them.

User acceptance of information systems has gained extensive notice in IS research. With empirical studies on user acceptance of IS, development of the theoretical frameworks for user acceptance in the implementation of the systems have helped researchers and professionals deeply understand adoption and usage processes. Studies that propose theoretical frameworks and provide empirical findings for the respective theoretical framework have collected (Ajzen & Fishbein, 1980; Davis, Bagozzi, & Warshaw, 1989; Mathieson, 1991; Thompson, Higgins, & Howell, 1991). Among the models, TAM has been accepted as the most robust, prudent, and dominant.

TAM adapts the Theory of Reasoned Action (TRA) provides the theoretical basis for TAM to understand the specifying causal relationship between the constructs in the model. Given TRA's common applicability across a wide variety of field, applying it to the ITAM adapts the Theory of Reasoned Action (TRA) which provides the theoretical basis for TAM to understand the specifying causal relationship between the constructs in the model. Given TRA's common applicability across a wide variety of field, applying it to the IS context is considered appropriate.

THEORY OF REASONED ACTION

The Theory of Reasoned Action (TRA) is an intention model developed to elucidate the determinants of consciously intended behaviors (Ajzen & Fishbein, 1980). Generally speaking, TRA is intended to explain virtually any human behavior. The purpose of the theory is "to predict and understand an individual's behavior" (Ajzen & Fishbein, 1980). The denominator of TRA is the hypothesis that "human beings are usually quite rational and make systematic use of the information available to them" (Ajzen & Fishbein, 1980). Therefore, the theory suggests that people consider the implications of their actions before they decide to execute the specific behavior. TRA is based on the conception that a person's intention to execute a behavior determines his action. Thus, in order to understand human behavior, it is important to identify what determines intentions. TRA suggests that one's performance of a behavior is determined by his behavioral intention to perform the behavior.

In TRA, it is assumed that most behaviors of social relevance are under volitional control and are thus predictable from intentions. In TRA, intention is considered to be the immediate determinant of behavior. It is claimed that when a proper measure of intention is used, intention explains the variance of behavior more accurately. However, the extent to which intention determines accurate prediction of behavior depends on two factors: First, the measure of intention should correspond to the measure of behavior in action, target, context, and time. It is essential to obtain an appropriate measure of intention in order to ensure high correspondence between intention and behavior. Second, since intentions can change over time, it is essential to measure the intention as closely as possible to the behavior in order to maximize behavioral prediction (Ajzen & Fishbein, 1980).

TRA assumes that behavioral intention (BI) is collectively explained by an individual's attitude (A) toward the behavior and subjective norm (SN). (Figure 2.1). According to TRA, a person's behavioral intention is determined by his attitude toward performing the behavior and by his subjective norm. Attitude refers to "his favorable or unfavorable evaluation of his performing the behavior" (Ajzen & Fishbein, 1980), and subjective norm refers to "his perception that most people who are important to him think he should or should not perform the behavior" (Ajzen & Fishbein, 1980). It can be said that a person is likely to perform those behaviors that he favorably evaluates and that he perceives important referents think he should perform. The relative weights of the two components, attitude and subject norm, in determining intentions vary depending on a given behavior and individual.

The theory also seeks to explain why people hold certain attitudes and subjective norms. In TRA, attitudes are postulated to be a function of behavioral beliefs. Behavioral beliefs refer to "the person's beliefs that the behavior leads to certain outcomes" (Ajzen & Fishbein, 1980). A person who believes that performing a given behavior will result in positive consequences is likely to hold a favorable attitude toward performing the behavior, while a person who believes that performing the behavior will yield negative consequences is likely to hold an unfavorable attitude. Similarly, subjective norms are postulated to be a function of normative beliefs. Normative beliefs refer to "the person's beliefs that specific individuals or groups think he should or should not perform the behavior" (Ajzen & Fishbein, 1980). A person who believes that important referents think he should perform the behavior will have a subjective norm to perform the behavior. In summary, the theory suggests that it is possible to explain and predict an individual's behavior by measuring his attitude toward the behavior, his subjective norm, and relative weights of these attitudinal and normative factors. Ajzen and Fishbein (1980) hold the view that external variables may influence a person's beliefs and the relative weights of his attitudinal or normative beliefs. These variables can be personal characteristics such as authoritarianism, introversion- extroversion, and a need for achievement; demographic variables including gender, age, social class, and race; and such factors as social role, status, socialization, intelligence, and kinship patterns (Ajzen & Fishbein, 1980). However, these external variables do not

constitute an integral part of TRA because different external variables need to be invoked to explain a different behavior. Ajzen and Fishbein assert that external variables are not expected to have consistent effects in different contexts, and that there is no necessary relation between any external variable and a given behavior. Thus, TRA seeks to account for the relations between any external variable and any behavioral phenomenon that can be controlled by a person's volition. Since the introduction of the theory, TRA has been widely studied in various subject areas (Ajzen & Fishbein, 1980; Bagozzi, 1981; Davis, 1985; Fishbein & Ajzen, 1975).

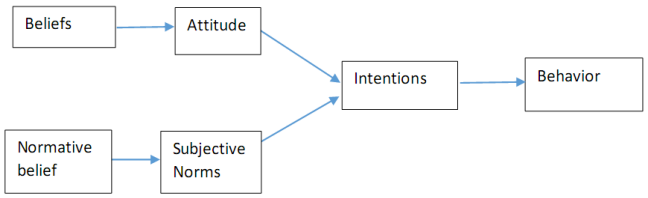

Fig. 1 Theory of Reasoned Action

TECHNOLOGY ACCEPTANCE MODEL

Although there have been a number of studies conducted in the areas of system acceptance, research on the effect of users' internal beliefs and attitudes on system acceptance has produced mixed and inconclusive findings. Recognizing that the lack of consistent findings in the usage behavior studies could be attributed to different measures employed in the studies and inadequate theoretical and psychometric justification, Davis (1986) developed and validated the measures of key theoretical constructs: perceived usefulness and perceived ease of use. Davis (1985) introduced the technology acceptance model (TAM), which specifically aims to model user acceptance of information systems.

TAM explains user acceptance of an information system based on user perceptions. The goal of TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis et al., 1989,). TAM employs the causal linkages between two key beliefs specified in TRA and users' attitudes, intentions and actual system adoption behavior. TAM posits that two theoretical constructs, perceived usefulness and perceived ease of use are fundamental determinants of user acceptance of an information system. Perceived usefulness (PU) is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis et al., 1989). Perceived ease of use (PEOU) refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis et al., 1989). The theoretical importance of PU and PEOU is based on an extensive analysis from various perspectives, including: expectancy theory; self-efficacy theory; behavioral decision theory; diffusion of innovations; marketing; and human-computer interaction (Davis, 1986).

TAM theorizes that system use is determined by behavioral intention (BI), and BI is jointly determined by the individual's attitude (A) toward using the system and perceived usefulness (PU). The A-BI relationship represented in TAM suggests that "all else being equal, people form intentions to perform behaviors toward which they have positive affect" (Davis et al., 1989). The PU-BI relationship represented in TAM implies that" with in the Improvements in PEOU are likely to increase the user's self-efficacy (Bandura, 1982) and performance, in turn increasing his affect toward the behavior. Beliefs are considered important in system adoption because of their influence on usage behavior. Their importance is further underscored in that they are amenable to strategic managerial manipulation through interventions such as system design and training (Davis, 1993; Venkatesh, 1999). TAM posits that PU is determined by PEOU and external variables. PEOU is postulated to have a direct effect on PU. It suggests that other things being equal, a system perceived to be easier to use is likely to be perceived as more useful. External factors are also postulated to influence usefulness beliefs. External factors may include system features, training, documentation, and user support consultants (Davis et al., 1989). TAM also posits that PEOU is determined by external factors. In order to identify the impact of external factors on internal beliefs, attitudes, and behavioral intentions, TAM uses TRA to specify the theoretical relationships among the variables and incorporates the cognitive and affective variables of user acceptance from prior research. External factors provide "the bridge between the internal beliefs, attitudes and intentions represented in TAM and the various individual differences, situational constraints and managerially controllable interventions impinging on behavior" (Davis et al., 1989). In a system implementation, by manipulating these external variables, system developers can influence users' beliefs of the system and subsequently their behavioral intentions and system use (Hong, Thong, Wong, & Tam, 2002).

The original TAM variables may not adequately capture key beliefs that influence consumer attitudes toward E-commerce. In a series of studies, the coverage of TAM has been extended and, in addition to the variables in the classical TAM approach, trust, social personality and perceived enjoyment have been added [Gefen et al., 2003; Pavlou, 2003; Wu

and Chen, 2005; Lingyun and Dong, 2008]. However, in addition to these factors, several other factors, including personal characteristics (age, sex, income, education and culture), internet experience, normative beliefs, shopping tendencies, online experience, safety, system quality, psychological perception (the perception of risk and benefit), online shopping experience, availability, service quality and attitude, have been added to the TAM for better modelling. Although it was stated in the past that these factors would construct the online shopping model as a whole, the models where all these factors are handled as a whole were only theoretically examined, and some of these factors were not included in the model in practical studies [Moon and Kim, 2001; Devaraj et al., 2002; Chen et al., 2002; Alreck and Settle, 2002; Pavlou, 2003; Park et al., 2004; Susskind, 2004; Pires et al., 2004; Klopping and McKinney, 2004; Yu et al., 2005; Lim et al., 2005; Zhou et al., 2007; Crespo and del Bosque, 2008; Lingyun and Dong, 2008].

EVALUATION

After detailed review of these studies, we noticed the following claims. First PU is a strong predictor of behavioral intentions in E- commerce. Second, there is a association between PU and PEOU. Third, we should measure actual use instead of behavioral intentions. Also, there is a scarcity of TAM studies measuring actual use. In fact, all the TAM studies we examined, with the exception of three (Straub et al., 1995; Szajna, 1996; Venkatesh et al., 2003), used intentions or self-reports as a substitute measure for behavior. Fourth, we identified TS and OS as possible predictor variables of both behavior intentions and actual use. Fifth there is a need to study behavioral expectation in addition to behavioral intentions when predicting the behavior using the TAM.

CONCLUSION

TAM is a good theoretical modal to understand and explain behavior and attitude in E-commerce use. It has been explained by the various studies that understanding of TAM can direct scholars to enhance the model and developers to plan diverse human interactions interfaces for diverse online consumers and as a result to attain high e-commerce adoption. The authors discussed the major strengths of TAM as well as minor weaknesses that have led to various extensions.

Authors found that TAM is the most frequently used model in predicting e commerce adoption with most studies being carried out in developing countries. They also found TAM to be suitable in providing most statistically outcome in e commerce adoption. In addition, the classical TAM deficits have been adequately catered for with various extensions that added the essential missing variables such as trust and quality as intervening variables. The authors recommended further study of TAM within other adoption areas such as green computing and cloud computing systems. This will offers comparative studies from diverse fields.

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