



Consumer technology traits in determining mobile shopping adoption: An application of the extended theory of planned behavior

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ARTICLE INFO

Available online 30 June 2012

Keywords:

Mobile shopping adoption
Consumer traits
Theory of Planned Behavior (TPB)

ABSTRACT

An extended Theory of Planned Behavior (TPB) model was examined within the context of mobile shopping with moderating effects of three consumer technology traits (i.e., technology self-efficacy, technology innovativeness, and level of experience of use). Among the beliefs of the extended TPB, perceived enjoyment was the strongest determinant creating a favorable attitude toward mobile shopping adoption. The results supported that consumers differ in levels of technology traits in mobile shopping adoption behavior. Implications are provided to assist in predicting potential mobile consumer adoption behavior and in designing favorable mobile shopping environments that can be compatible with the consumer characteristics.

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Introduction

Consumer use of mobile shopping is rapidly increasing and purchases by mobile phones are expected to reach 31 billion by 2016 (Forrester, 2001). Although mobile shopping still occupies a small portion of e-commerce sales (7%), the versatility of mobile shopping services supported by widespread mobile technology appeals to consumers. In this embryonic stage of mobile shopping, contextual factors such as technology characteristics and user characteristics should be examined in order to determine the likelihood of specific factors in predicting mobile shopping adoption and how the design of the mobile shopping environment meets consumer characteristics.

In the adoption of technology in traditional consumer research, consumer characteristics have been viewed as significant predictive variables in determining behavioral outcomes (e.g., Hirschman, 1980; Davis, 1986; Ellen et al., 1991; Dabholkar, 1996; Karahanna et al., 1999; Agarwal, 2000; Dabholkar and Bagozzi, 2002). In predicting consumer mobile shopping adoption, consumer characteristics in adopting the technology-mediated shopping environment could be significant determinants in moderating the relationships among predictors of mobile shopping adoption. Since consumer traits differ in technology adoption, they may generate differential effects of evaluative criteria on the technology adoption behavior (Parasuraman et al., 2005). Furthermore, in this diffusion stage of mobile shopping, examining the effects of consumer

characteristics on mobile shopping adoption will assist in understanding underlying consumer differences in adopting mobile shopping.

In this study, three consumer characteristics (i.e., technology self-efficacy, level of experience of use, and consumer technology innovativeness) are regarded as significant consumer technology traits generating different consequences of mobile shopping adoption behavior. The three consumer traits are examined with the extended Theory of Planned Behavior (TPB) to determine the moderating effects of consumer traits among predictors of mobile shopping adoption. Therefore, this study aims to examine: (1) determinants of mobile shopping adoption in the extended Theory of Planned Behavior; and (2) the differential influences of consumer traits among the relationships between determinants and mobile shopping adoption in the extended Theory of Planned Behavior. The results of this study will contribute to understanding current and potential mobile shoppers' adoption behavior and provide implications for designing mobile shopping that is compatible with consumer characteristics.

Theoretical framework and hypothesis development

Extended theory of planned behavior in mobile shopping environment

The research model examining mobile shopping adoption is grounded in the Theory of Planned Behavior (TPB) with extensions of two perceptions (i.e., perceived usefulness and perceived enjoyment) adopting the technology. In the original TPB model,

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consumer intention is the formation of three beliefs— attitude, subjective norms, and perceived control (Ajzen 1985, 1991).

Determinants of attitude toward adopting mobile shopping

Attitude is the behavioral belief toward adoption of technology and refers to a consumer's positive or negative feeling in performing a particular behavior (Davis, 1989). Attitude can be further predicted by the strength of an individual's perceptions of technology adoption (Ajzen and Fishbein, 1980). In this present study, attitude can be determined by examining perceived usefulness and perceived enjoyment of using mobile shopping. Previous studies suggest that perceived ease of use, perceived usefulness, and perceived enjoyment are significant determinants of attitude in explaining consumer technology adoption behavior (Davis et al., 1989, 1992; Dabholkar, 1994b). In the extended TPB of this study, perceived ease of use is not included as a determinant of attitude because the researcher believes that perceived control in using a technology is similar in context to perceived ease of use; therefore, perceived ease of use may conflict with perceived control in fitting the extended TPB model. Previous studies (e.g., Wei et al., 2009; Cho et al., 2007) have suggested that perceived ease of use is an insignificant predictor in mobile service adoption. Thus, only two dimensions (i.e., perceived usefulness and perceived enjoyment) are used in this study to explain the effects of perceptions on attitude toward adopting mobile shopping.

Perceived usefulness is defined as the individual's subjective perception that use of the technology is useful (Davis et al., 1989). When consumers perceive that mobile shopping services and functions are useful in facilitating their shopping, the perception generates a positive feeling toward mobile shopping adoption. Perceived enjoyment means that the individual believes the technology is fun to use (Davis et al., 1992). The mobile shopping environment which is supported by new technology applications and immediate interactions with service encounters may generate a favorable attitude toward mobile shopping adoption. In addition, numerous studies have supported attitude as a significant predictive variable of behavioral intention (e.g., Ajzen, 1985; Bauer et al., 2005; Davis et al., 1989; Dickinger and Kleijnen, 2008; Kang et al., 2006). Thus, consumer attitude toward adopting mobile shopping influenced by the two perceptions (i.e., perceived usefulness and perceived enjoyment) is expected to have a direct and positive effect on intention to adopt mobile shopping. As a result, this study proposes that perceptions are positively related to attitude toward adopting mobile shopping and attitude will have a direct and positive effect on intention to adopt mobile shopping. Thus the following hypotheses are examined:

H1. The perceived usefulness of mobile shopping has a direct and positive effect on attitude toward adopting mobile shopping.

H2. The perceived enjoyment of mobile shopping has a direct and positive effect on attitude toward adopting mobile shopping.

H3. Attitude toward mobile shopping has a direct and positive effect on intention to adopt mobile shopping.

Subjective norm

Subjective norm is a normative belief influenced by social pressure to adopt or not to adopt technology (Young and Kent, 1985). Previous studies for technology-based services support subjective norm as a strong determinant of the services adoption (Mathieson, 1991; Taylor and Todd, 1995b; Sykes et al., 2009). Consumer adoption of technology is influenced by socialization forces associated with the desire to follow referent group norms (Kulviwat et al., 2009), thus subjective norm tends to direct group members' behavior (Kim et al., 2011). Further, consumers tend to recommend a service to others when they are satisfied with the

service (Fan et al., 2005), thus, referent group's suggestions are credible sources influencing consumer adoption decisions. Since mobile shopping is presented in a technology-mediated environment and connected via personalized mobile devices, consumers may be cautious about adopting mobile shopping and show a strong tendency to rely on significant others' opinions in making the decision to adopt. The significant others' influence on the adoption of mobile shopping will impact consumer intention to adopt mobile shopping. Thus, the following hypothesis is examined:

H4. Subjective norm has a direct and positive effect on intention to adopt mobile shopping.

Perceived behavioral control

Perceived behavioral control refers to an individual's perception of his/her capability to perform a behavior of interest (Ajzen, 1985; Ajzen and Madden, 1986). Perceived behavioral control includes perceptions of resources or knowledge to use the technology, technology facilitating conditions, and the individual's ability to perform the behavior easily (Thompson et al., 1994; Taylor and Todd, 1995a, b). The perception of user control is a key predictor of interactive technology adoption (Hoffman and Novak, 1996). When consumers perceive that technology is in their control, they perceive that they can control their task process and the perceptions will further increase consumer confidence about the outcome (Bateson and Hui, 1987). In contrast, when consumers perceive a lack of control in using technology, this prevents consumers from adopting the new technology (Hoffman et al., 1999). For the purposes of this study, perceived behavioral control is defined as the extent to which consumers have the technological infrastructure to support mobile shopping transactions (e.g., mobile Internet and data service availability, speed, and data processing capability). The technical infrastructure that supports the use of technology may be a precondition to adopt the new technology (Venkatesh et al., 2003). Technology adoption may not occur if the technology factors prevent the adoption (Kim et al., 2011). Thus, the perceived availability of technology facilitating conditions and resources may positively affect behavioral intention to adopt mobile shopping. The corresponding hypothesis is:

H5. Perceived behavioral control has a direct and positive effect on intention to adopt mobile shopping.

The moderating effects of consumer technology traits

Consumers differ in their adoption of new products, services, and shopping methods. Since consumers' perception of technology characteristics also differ, their adoption behavior may differ by individual consumer characteristic (Moore and Benbasat, 1991; Venkatesh et al., 2003). Consumer traits to use technology-based products or services will play a particularly significant role in explaining the behavioral intention to use a product or service. Demographic factors are not considered significant variables in understanding consumer behavior because in today's society, some level of access and familiarity with using simple technology devices is an everyday practice (Dabholkar and Bagozzi, 2002). Technology self-efficacy, technology innovativeness, and the individual level of experience using technology are expected to be significant in moderating the relationships among determinants of mobile shopping adoption.

Technology self-efficacy

Technology self-efficacy refers to belief about one's ability to perform a specific behavior with confidence in achieving positive task outcomes (Compeau and Higgins, 1995b). The effect

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