Analysis of Determinants of M-Commerce Adoption by Online Consumers

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Abstract

M-Commerce is the making of payments for products and services through the use of mobile devices. The proliferation of mobile devices has resulted to into substantial growth of M-commerce. This is as a result of anytime anywhere connectivity, low cost of business, increased new sales avenues and customer loyalty. But even with the high penetration rate of Mobile phones, a relatively low adoption rate of M-Commerce has been observed in the developing countries. This study provides the theoretical underpinning for various interventions to promote M-Commerce Adoption. The study uses the literature review to identify the factors which influence the adoption of M-Commerce by consumers. The results from this study will be useful to m-commerce companies in formulating appropriate marketing strategies, as well as developing appropriate applications that address the needs and resources of various stakeholders. The outcome of this study will guide companies that offer M-Commerce related products in the selection of digital products and in pursuance of future commercial opportunities. The finding of this study recommends that the government should set up legislation that would ensure customer security in order to enhance trust and hence enhance M-Commerce adoption.

Keywords: Mobile commerce, adoption, Technology Acceptance Model (TAM), Consumer Intention to Use(IU), Perceived Ease of Use (PEOU), Perceived Use (PU)

1. Introduction

Mobile commerce, often referred to as m-commerce, typically designates the use of wireless devices (particularly mobile phones) to conduct electronic business transactions, such as product ordering, fund transfer, and stock trading (Kalakota and Robinson, 2002). Currently M-commerce has become the latest trend to conduct business instead of e-commerce (Hseih, 2007).M-commerce offers greater opportunities for faster access, more effective, more powerful and absolutely accessible applications anytime anywhere for its users.

M-commerce was initially expected to experience a substantial growth for several reasons, such as the rapid proliferation of mobile device adoption and the obvious advantages of anytime-anywhere connectivity. However, most m-commerce applications, except for a very few personal applications like ringtone downloads, have failed to meet expectations (Anil *et al*., 2003; Liang and Wei, 2004). It is therefore important to shed light on the social, behavioural and technological characteristics affecting the adoption of m-commerce by online consumers.

A report from ABI research, 2010; revealed that mobile online shopping had increased by more than threefold to $1.2 billion in the U.S and exceeded $10 billion in Japan in 2009. By the end of 2010, M-commerce market in Europe was expected to outpace the U.S. Globally the Mobile online shopping is expected to hit $119 billion in 2015.

ITU estimates that by the end of 2025, the global market size for mobile subscribers will be 9 billion. With usage of cellular phones, personal digital assistants, laptops, pocket and tablet computers on the rise, the potential of m-commerce is enormous (Zhou, 2011). According to Chong *et al*. (2011) the number of mobile internet users worldwide was expected surpass 6 billion by 2013. However the level of m-commerce adoption is low compared to the mobile devices penetration. With the explosion and development of the wireless networks and technology such as 3G (Third Generation) M-commerce is becoming a new issue in Information System (IS) research agenda. The objective of this study is therefore to determine the factors influencing the adoption of M-commerce by online users. The research has reviewed the existing literature to outline the factors which influence the adoption of M-commerce.

2. Literature Review

2.1 M-commerce

M-commerce is described as, "e-commerce business processes and models carried out on a mobile terminal" (Gordon *et al*, 2001). This view can however be expanded to include the other M-commerce services e.g. location-based services, airtime purchases, ringtone downloads and mobile payments (including Point-of-Sale payments). Abu Bakar and Osman (2005) defined m-commerce as exchange or buying and selling of commodities and services through wireless handheld devices such as cellular telephones and personal digital assistant (PDAs).According to Feng*et al*. (2006), m-commerce is a new and innovative business opportunity with its own unique characteristics and functions, such as mobility and broad reachability. This study adopts the definition of m-commerce as any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobiles devices to access computer-mediated networks with the help of a mobile device.

2.2 Model Development

Adoption is an individual's decision to become a user of a product or a service. This study seeks to find out the factors that influence the adoption of M-commerce by online consumers from the existing literature. Mobile Commerce refers to either direct or indirect commercial transactions conducted through mobile devices. Mobile applications may be divided into two broad categories, content delivery and transactions (i.e. m-billing, m-ticketing, m-marketing etc.). According to Watson et al, 2002, mobile services are important for firms and consumers because of ubiquitous, universal, and anytime anywhere access to information and services, and the possibility for unique and personalized exchange of information. The main purpose of this research is to determine the factors affecting the adoption of M-commerce by consumers (Users) and to enable the stakeholders to prioritize and allocate necessary resources.

Technology Acceptance Model proposed that perceived usefulness (PU) and perceived ease-of-use (PEOU) can be used to predict the behavioral intention to adopt a technology. PU refers to the extent to which an individual's expectation to use a technology, improves his/her job performance whereas PEOU is the belief that using the technology will be free of effort (Davis, 1989; Fusilier and Durlabhji, 2005). This theory therefore supports two constructs, Perceived Usefulness and Perceived Ease of Use.

The Theory of Planned Behavior states that behavioral intention to perform an activity is determined by attitude, perceived behavioral control, and subjective norm (Ajzen, 1991; Fusilier and Durlabhji, (2005).According to Khalifa and Shen, (2008), TPB focuses on social and individual factors which influence the adoption of a technology. The Theory of Planned Behaviour further states that behavioural intention to perform an activity is determined by attitude, perceived behavioral control, and subjective norm (Ajzen, 1991; Fusilier and Durlabhji, 2005).

Diffusion of Innovation Theory states that there are five perceived attributes of an innovation that can determine the adoption of an innovation (Rogers, 1995; Chong and Ooi, 2008). The five perceived attributes of the innovation are relative advantage, compatibility, complexity, trialability and observability (Rogers, 1995). Relative advantage is the "degree to which an innovation is perceived as being better than the idea it supersedes". Compatibility is defined as the degree to which an innovation is perceived as "consistent with past values, past experience, and the needs of the potential adopters". The complexity of an innovation is whether the innovation is "perceived as relatively difficult to use and understand". Trialability refers to whether an innovation may be "experimented with, on a limited basis". Lastly, observability is whether the "results of an innovation are visible to others" (Rogers, 1995).

This study is therefore informed by a combination of the three theories i.e. TAM, TPB and DOI which together support the social, behavioral and technological constructs determining the adoption of m-commerce by users.

2.2.1 Perceived Usefulness

According to Hong *et al.*, (2008), Perceived usefulness is a prominent factor which is widely used in explaining consumer behaviour towards a new technology. According to Davis, (1989), Perceived Usefulness of a system may be defined as the extent to which individuals believe that using the new technology will enhance their performance. Therefore perceived usefulness can influence the intention to accept and adopt mobile commerce directly or indirectly. Garrison, (2009) and Khalifa & Shen, (2008) in their study argued that Information Systems and M-commerce provides evidence on the significant effect of Perceived Usefulness on adoption intention. Hence it would be essential to include perceived usefulness in the model.

A number of empirical studies (Wei *et al.,* 2009; Khalifa & Shen, 2008; Kim & Garrison, 2009) support Perceived Usefulness as a primary predictor of M-commerce adoption. According to Wei *et al.*, (2008), this construct assess the extrinsic characteristics of mobile commerce and further shows how mobile commerce can help the users to achieve task-related goals, effectively and efficiently.

Mao et al(2005), in their study "Overcoming barriers to the successful adoption of mobile commerce in Singapore" explored the key factors that influence the usefulness, ease of use and intensions to use advanced mobile phone services for payments. The results portrayed a positive relationship between Perceived Usefulness and the intention to use mobile services.

2.2.2 Perceived Ease of Use

Perceived Ease of Use (PEOU) can be defined as the degree to which the prospective user expects a new technology to be free of effort. It is further described as the internal belief of mental effort involved in using a system. This study defines it as the degree to which the user expects the system to be user friendly. According to Davis, (1989); an individual may believe that an application is useful, but he or she might also find that the system is difficult to use. PEOU is considered as an important determinant in adoption of past Information Technologies such as intranet (Chang, 2004), 3G (Liao *et al.*, 2007), online banking (Guriting and Ndubisi, 2006; Jahangir and Begum, 2008), wireless internet (Lu *et al.*, 2003), internet commerce (Cho *et al.*, 2007) and recently m-commerce (Lin and Wang, 2005; Wang and Barnes, 2007; Kurnia*et al*., 2006; Mallat*et al*., 2006; Luarn and Lin, 2005). Many previous empirical studies show that perceived ease of use has a positive influence in the adoption of mobile commerce (Khalifa and Shen, 2008b,Kim and Garrison, 2009; Wei et al., 2009). Many users take PEOU as a crucial factor since many of them are common citizens who are not necessarily adept in technology. This construct should therefore be included in the model.

2.2.3 Perceived Cost

Perceived cost construct can be defined as the extent to which an individual believes that using a technology is costly. Cost is essential in setting up and in the delivery of M-commerce services. Cost can slow down the expansion of a new technology. Cost consist of the initial purchase price of the hand set, ongoing usage cost, subscription fee, service fee, communication fee and maintenance fee or upgrade cost. According to Hong *et al*., (2008), Wei *et al*., (2009) in a study on m-commerce adoption, identified cost factor as one of the reasons that can slow down the adoption of M-commerce. In this study, perceived cost has been identified as an important determinant for consumers to decide whether to adopt M-commerce or not.

2.2.4 Personal Innovativeness

Personal Innovativeness is the willingness of an individual to try out any new information system. It has been observed that highly innovative individuals are active information seekers about new technologies. Innovative individuals have been found to be dynamic, communicative, curious, adventurers, and stimulation–seeking. According to (Bhatti,2007; Li *et al.*, 2007); Personal Innovativeness has a strong influence on adoption of innovations such as mobile commerce. Li *et al.*, (2007) found out that there is a relationship between personal innovativeness and the adoption of mobile commerce. A person who is innovative is more likely to adopt a new technology (Anthony, 2007). Personal innovativeness is therefore a predictor of m-commerce adoption and is included in the model.

2.2.5 Demographic Variables

A study carried out by Cutler *et al*., (2003); Liebermann and Stashevsky, (2002); Teo, (2001); Herna´ndez *et al*., (2011); revealed that the demographic profiles of users influence the adoption of internet and computer technologies. Educational level has been found to have a positive relationship with online transactions. Rhee and Kim, (2004) and Chinn and Fairlie, (2006) found that people with high education level were more likely to use the internet. This is because they have more so ending power and might be more willing to purchase using mobile services. They might also have better knowledge of computers or mobile devices and are likely to use them to carry out online transactions. Recent studies have suggested that younger users tend to adopt m-commerce more than older users (Dai and Palvia, 2008).Gender is also a demographic variable that has been examined in computer adoption studies (Igbaria and Chakrabarti, 1990;Teo, 2001). The above study shows that males in general were more receptive to technologies when compared to their female counterparts. Among the reasons provided in the literature include the fact that males have higher self-efficacy, and are more confident about exploring new technologies. Teo (2001) also found that males and females have different internet usage patterns, whereby females tend to use the internet for communication such as messaging, while males tend to use the internet for downloading and purchasing. Yang(2005), carried out a research to explore the factors affecting the adoption of m-commerce in Singapore. Their research reveals that innovativeness, past adoption knowledge; demographic factors and past behaviour have a positive effect on adoption of m-commerce.

2.2.6 Perceived Trust

According to Rousseau *et al*., (1998), trust is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another". Trust is important because it helps consumers overcome perceptions of uncertainty and risk (McKnight 2002) and helps build appropriate favorable expectations of performance and other desired benefits (Gefen, 2000). Trust is more crucial and complex in M-commerce environment than in traditional commerce due to its uncertain environment (Lu *et al*., 2003; Cho *et al*., 2007) and information asymmetry (Cho *et al*., 2007). The buyers and sellers normally complete the transaction through these technologies without necessarily meeting each other face to face. The buyers will therefore be worried that their personal information and money will be transferred to third party without their knowledge (Luarn and Lin, 2005). Consumers' confidence about privacy and security of a system may significantly influence adoption and usage of m-commerce. In this study, trust is defined as the extent to which an individual believes that using m-commerce is secure and has no privacy threats. Perceived Trust therefore is an important construct which affects consumer behavior and determines the success of M-commerce adoption (Wei *et al*., 2009). It is an important predictor which explains the adoption in a number of existing technology adoption studies e.g. (Wei *et al*., 2009; Cho *et al*., 2007). Sadi and Noordin (2011), in an exploratory analysis of the factors influencing adoption of M-commerce in Malaysia reveals that trust identified as a key factor influencing the adoption of M-commerce. A similar study carried out by Mashagba et al,(2013) revealed that trust, risk and security had an effect on M-commerce adoption. This study therefore adopts it as a key factor influencing the adoption of M-commerce by online consumers and includes it in the model.

2.2.7 Social Influence

According to Lu *et al*. (2003), social influence is defined as an individual's belief that it is significant for other individuals to engage in an activity. Subjective norm is studied in both TRA and TPB as the important determinant to explain the adoption of a system. Rao and Troshani,(2007). Fan *et al*., (2005), argue that a user would be more likely to suggest and recommend a service to others, if he or she is satisfied with the service. Khalifa and Cheng, (2002) also revealed that SI had strong effect on consumer IU or adoption of m-commerce. This study adopts Social Influence as a predictor of the adoption of m-commerce and therefore includes it in the model.

2.2.8 Perceived Behavioral Control

According to the Theory of Planned Behavior, perceived behavioral control is defined as individual perceptions of how easy or difficult it is to perform a specific behavior. The perceived behavior is an important determinant of behavioral intentions by reducing perception of control, confidence, and effortlessness in executing a behavior. (Pavlou*et.al,* 2007).

A significant number of researches in mobile commerce have highlighted the importance of Perceived Behavioral Control by demonstrating its influence on key dependent variables (Pavlou *et al.*, 2007; Perdersen, 2005; Khalifa & Shen, 2008).Pedersen (2005) further argued that Generally PBC comprises of individual constraints which include and are not limited to economy, experience and skill in service usage.

3. Discussions

Based on the reviewed literature, companies involved in m-commerce should focus on improving the usefulness of the system, trust (i.e. security and privacy protection) and reducing the cost of m-commerce services to enhance the adoption of m-commerce. This information will enable m-commerce application developers to have a better understanding of the important features that they need to focus on, and the type of consumers they should design their applications for. In particular one of the key strengths of m-commerce is personalization. Understanding the relationship of m-commerce and the demographic profiles of consumers helps m-commerce application developers to personalize the services and consequently enhance the adoption of m-commerce.

 The reviewed studies have shown that PU plays a vital role in influencing the behavioral intention of adopting a technology. Consumer adoption of m-commerce will only increase when they find it useful. This is because m-commerce has unique characteristics such as ubiquity and immediacy, whereby users can retrieve information immediately and conduct the transaction anytime and anywhere. The more useful the online consumers perceive m-commerce, the more they are likely to adopt it. Service providers and vendors attention should focus on designing the reliable systems that will meet the users' needs, as well as providing useful and quality information to users. The service providers and vendors should also concentrate on building trust by developing m-commerce systems with valuable functions, to assure the security and privacy of the users.

Without proper security and privacy protection, users will not trust the services provided by m-commerce and the users/consumers may not easily adopt it. According toWang and Barnes, (2007); the trust building strategies include advertising campaign, privacy guarantees, company policies and statement, laws and regulations.

Prior studies by Shin, (2007); Khalifa and Cheng, (2002); Kurnia *et al.*, (2006), showed the importance of Social Influence in predicting the adoption of m-commerce. Mobile device users between the ages of 21-30are considered to be in the lead segment (Wong and Hiew, 2005) and are easily vulnerable to SI (Lu *et al.*, 2003). They are more sensitive to the new trends and are normally involved in rapid shift of trends and styles (Shin, 2007). Influence that comes from mass media or peers may easily influence their decision to adopt m-commerce. Hence, it is important for the service providers and vendors to consider the SI factor to encourage the adoption of m-commerce.

Perceived cost is one of the barriers of m-commerce adoption as seen in previous researches (Luarn and Lin, 2005; Linand Wang, 2005; Wong and Hiew, 2005). These studies have shown a negative relationship between the financial cost of using m-commerce and the consumer Intention to use m-commerce. Increasing the cost of handsets, subscription fee and communication fee will result in the decrease in adoption of m-commerce. Subsequently most users will adopt m-commerce if the cost is reasonable for them. The perceived cost can be reduced through the creative promotional and pricing strategies.

4. Conclusion

This study aimed at identifying the factors that influence adoption of m-commerce by online consumers. Using the existing literature, the study has shown that perceived usefulness, Perceived ease of use, perceived cost, perceived trust, personal innovativeness, perceived behavioural control, social influence and demographic variables influence the adoption of m-commerce by online users. According to Wang and Barnes (2007), trust is much more significant than the other constructs; this implies that trust building between the customers and vendors should be a major concern for the mobile service providers while improving the usefulness of the system which in turn will impact positively on the adoption of m-commerce. Perceived cost is also an important factor; therefore, this study suggests that the creative promotional and pricing strategies, including cost reduction should be implemented to attract more price-conscious customers. The social influence should be taken into account to encourage the adoption of m-commerce. For instance, the service providers should attract customers via various social networks and channels, such as word of mouth and informal seminars (Lu et al., 2008)

The outcome of the study will guide companies that offer M-commerce related products in the selection of digital products and in pursuance of future commercial opportunities.

The government should formulate policies especially focusing on trust and security,to encourage m-commerce adoption by online consumers.

5. Way Forward

Most of the studies reviewed followed a longitudinal approach to determine the factors influencing adoption of m-commerce; future studies can use cross sectional approach in order to provide results which can be generalized.

Adoption of m-commerce might be influenced by the services provided by the mobile service subscribers e.g. one service provider might offer more services than the other; a future study can focus on a comparative study to investigate if there are any differences in the adoption of m-commerce between the different mobile service providers.

Since perceived cost has been found to be a factor influencing the adoption of m-commerce, it would be interesting to do a comparison of the prices offered by these different mobile service providers and see if the providers with lower m-commerce service fees will actually have a higher adoption of the technology.

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