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Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia

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ABSTRACT

Advancements in wireless communications have increased the number of people using mobile devices, and have accelerated the growth of mobile commerce (m-commerce). This study aims to investigate the factors that predict consumer intention to adopt m-commerce in Malaysia and China. The work extends the traditional technology acceptance model (TAM) and diffusion of innovation (DOI) model, and includes additional variables such as trust, cost, social influence, variety of services, and control variables such as age, educational level, and gender of consumers. By comparing consumers from both Malaysia and China, this research is able to form a prediction model based on two different cultural settings. Data was collected from 172 Malaysian consumers and 222 Chinese consumers, and hierarchical regression analysis was employed to test the research model. The results showed that age, trust, cost, social influence, and variety of services are able to predict Malaysian consumer decisions to adopt m-commerce. Trust, cost, and social influence can be used to predict Chinese consumer decisions to adopt m-commerce. This research confirms the need to extend the traditional TAM and DOI models when studying technology such as m-commerce. The results from this study will be useful for telecommunication and m-commerce companies in formulating marketing strategies.

1. Introduction

Electronic commerce (e-commerce) has revolutionized business since it first gain prevalence in the 1990s. The introduction of e-commerce to businesses brought profound changes to the competitiveness and structure of industry. An example of this would be the travel and music industries, which have seen significant changes to their business models as a result of e-commerce. However, with the growth of wireless communication technologies, mobile commerce (m-commerce) is now seen as the new business model and platform that will have a similar, if not bigger, impact on the business communities and industries than e-commerce. M-commerce is an extension of e-commerce, whereby the transactions of businesses are conducted in a mobile environment using mobile devices. M-commerce offers the advantages of ubiquitous access to information, anytime, anywhere. The opportunities presented by m-commerce are reflected by the growth of mobile phones. According to the International Telecommunication Union [48], mobile subscribers will surpass 5 billion users worldwide in 2010. The International Telecommunication Union [48] also estimates that at the end of 2010 there will be 940 million 3G subscriptions. Gartner [46] also estimates that by 2011, 85% of handsets shipped globally will include browsers.

The growth of personal computers and the Internet created opportunities for e-commerce in the late 1990s and early 2000s. The current potential of m-commerce far exceeds that of e-commerce, given the increasing number of people who own mobile phones. IDC [47] believes that by 2013, the number of mobile Internet users worldwide will surpass 1 billion users.

Personalization is one of the main advantages offered by e-commerce and m-commerce. Mobile phones such as iPhone and Blackberry have become important business and personal devices for consumers. Consumers use their mobile phones to listen to music, watch videos, play games, conduct business transactions, and connect to social networking sites. The interactions between consumers and their mobile phones have presented opportunities for organizations to use m-commerce to personalize services to customers. Realizing these opportunities, organizations have been investing in m-commerce infrastructure, services and devices. M-commerce applications such as mobile banking usage have doubled from 2008 to 2009 [45]. The potential of m-commerce is also gaining attention in many developing countries. Developing countries present a market which has huge potential for many telecommunication and m-commerce service providers. China and India for example, have huge populations, and many people in these countries own a mobile phone. China has 957 million mobile phone subscribers, and the number is projected to grow to approximately 1.3 billion mobile subscribers by 2014 [44]. However, it should be noted that although the number of

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mobile subscribers are increasing, actual m-commerce activities in many developing countries remain low. This means that although consumers are using mobile phones to surf the Internet, listen to music, the widespread usage of m-commerce, where consumers conduct transactions for goods or services using their mobile phone, remain low [36]. The key question faced by telecommunication providers is how to transfer the potential of m-commerce into financial profits. The adoption of internet technologies such as e-commerce and online banking has been studied by researchers [5,9,21]. Studies on consumer decisions to adopt m-commerce however, remain sparce [36]. Among those who have studied m-commerce adoption, these studies have examined mainly existing models such as Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) [36]. Although these models are well established, they have often investigated the decisions to adopt technologies based on the perceived ease of use, perceived benefits, and technology characteristics (e.g. compatibility, trialability). M-commerce has different characteristics from technologies such as e-commerce. For example, users might have more concern on privacy and security issues using m-commerce given that data is transferred wirelessly, thus making interception of data much easier. Unlike e-commerce, m-commerce's services might be less. This present a dilemma for many service providers, as not many software companies might want to develop applications for m-commerce given the lack of users, and users do not want to use m-commerce as it lacks services. Given such an environment and the characteristics of m-commerce, it is important to develop a research model that extends beyond what traditional TAM and DOI can offer. Furthermore, Ngai and Gunasekaran [27] recommended that studies on users' experience should be conducted as the technology infrastructure matures. Developing countries such as China and Malaysia offer interesting perspectives on the study of m-commerce adoptions. The technological infrastructures such as 3G, WiMax are relatively advanced in Malaysia, while young consumers in these countries are technology savvy. However, in terms of m-commerce usage, these countries are still an emerging market compared to countries such as the United States and Japan [36]. Ngai and Gunasekaran [27], as well as Lee et al. [20], also state that although there are many published works on the technology side of m-commerce, there exists "very limited research on the strategies and applications of m-commerce" [20,27]. Therefore the purpose of this study is to fill the existing research gap by developing a model that predicts a consumers' decision to adopt m-commerce. This study will conduct a cross country analysis between consumers in China and Malaysia.

2. Literature review

2.1. M-commerce

Various management information system researchers have provided different definitions of m-commerce. M-commerce is often considered a subset of e-commerce [27]. It is similar to e-commerce except that the transactions by m-commerce are through a mobile device via wireless connections [35]. Yang [41] defined m-commerce as transactions conducted through a variety of mobile equipment over a wireless telecommunication network in a wireless environment. Others who have offered similar definitions of m-commerce include Wu and Wang [39], Wong and Hsu [37].

Feng et al. [8] however, stated that m-commerce is more than an extension of e-commerce. They stated that given m-commerce's different interaction styles, usage patterns and value chain, m-commerce provides a complete new business model with its characteristics such as mobility and reachability [36]. Moshin et al. [25] and Tiwari and Buse [34] viewed m-commerce as m-business. The differences between m-commerce and m-business are that m-business does not limit itself to the transaction of monetary values via mobile devices. Tiwari and Buse [34] argued that it is not appropriate to constraint m-commerce to transactions of monetary value, as it ignores the commercial nature of marketing measures and after-sales services offered by m-commerce. Furthermore, m-commerce activities such as sending free games or music to users might not involve monetary transactions. Using the statement "wireless telecommunication networks" also misleads users that the transactions have to be completed exclusively through wireless telecommunication networks [34]. For this research, the term m-commerce will be used instead of m-business as it is a more common term in the field. However, the authors agree that the definition of m-commerce should not be limited to monetary values and wireless telecommunication networks, and therefore the definition from Tiwari and Buse [34] is adopted, which states that m-commerce is "any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobiles access to computer-mediated networks with the help of mobile devices".

2.2. M-commerce in China and Malaysia

Although m-commerce is a well adopted technology in developed countries such as Japan, Korea and the United States, it is still at a growing stage in many developing countries [36], [24]. M-commerce has gained attention because of its potential to surpass the success of e-commerce. As of 2008, the number of mobile users in China has far exceeded the number of Internet users. There are 630 million mobile phone users when compared to 298 million internet users [40]. Although the potential of m-commerce is high in China, Wauters [51] stated that mobile Internet users in China do not monetize as well as users in the United States. Mobile advertising for example, is still relatively low when compared to the number of mobile users. Ming et al. (2008) also found that m-commerce is still not well accepted by Chinese consumers. However, driven by the potential of m-commerce, large companies are still putting m-commerce at the top of their business agenda [42]. China Mobile for example, invested 5.8 billion dollars to purchase 20% of Shanghai Pudong Development Bank to expand its mobile payment business. A study conducted by Digital Media Across Asia [43] showed that besides sending SMS and making calls, most mobile users use their mobile phones to listen to music, play downloaded games, and read news. This however, does not fully make use of m-commerce's potential. Users rarely use their mobile phones to purchase products or conduct mobile banking [43].

Similar to China, m-commerce is also at a growing stage in Malaysia. Most of the m-commerce activities in Malaysia are information based rather than transaction based [47]. Users will often use their mobile device to access travel directions, flight schedules, and dining guides. M-commerce is also mainly accessed via 3G. However, although the number of mobile phone users in Malaysia is high, 3G adoption is relatively low in Malaysia [3]. According to Malaysian Communication and Multimedia Commission (MCMC), Malaysia ranks second in Southeast Asia among Internet penetration, behind Singapore, which is a developed nation. The internet penetration rate in Malaysia is 57.80%. However, in terms of the mobile phone penetration rate, there are 100.8 mobile phones per 100 Malaysians [50]. Surveys from MCMC [50] showed that 84.4% of Malaysians access the internet via mobile phones through GPRS, followed by 16.5% who use 3G, and 12.1% who use WAP. Only 1.5% of the users use EDGE. This shows that Malaysian users in general, might not be making use of the potential of the mobile internet, which can hinder the growth of m-commerce. GPRS is relatively slow when users need to use more bandwidth for m-commerce. Nevertheless, the total wireless subscribers in Malaysia are expected to reach 44.2 million in 2013 [43].

Past studies on m-commerce/mobile technologies have been conducted either specifically in Malaysia [36] or China [29]. In these studies, adoption models were built to predict the consumer adoption of mobile technologies. However, it is interesting to note that these studies have shown that the model proposed is limited to their particular country, and that the models proposed should be tested in other countries, by conducting a cross country comparison. Other studies that have attempted to conduct cross country comparisons include Harris [11] and Dai and Palvia [6]. However, these studies have been conducted either by comparing two developed countries such as