AN INTEGRATION OF LAZY USER MODEL AND TECHNOLOGY ACCEPTANCE MODEL IN THE ADOPTION OF MOBILE BANKING IN MALAYSIA

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DECLARATION

I hereby declare that the material in this thesis is my own except for quotations, excerpts, equations, summaries and references, of which have been duly acknowledged.

9 September 2016

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ABSTRACT

In a growing world of constant connectivity while on the move, users are getting empowered to do even more while on the go. The emergence of powerful smartphones and portable tablets, together with the ever improving wireless Internet technology enables users to conduct various mobile tasks that include mobile banking. Users are no longer desk bound, getting stuck in one particular location to use their desktops or laptops. The term mobile banking in this sense literally means conducting users' personal banking with their smartphone or tablets while on the go. However, there is unanticipated resistance with skepticism on the adoption of mobile banking and there is a need to understand the underlying factors of mobile banking adoption. This study aims to investigate and provide a fundamental framework for mobile banking adoption. This study explores Lazy User Model that suggests that users adopt technology based on the principle of least effort; together with Technology Acceptance Model that is widely known for its parsimony and one of the most adopted models in the field of technology acceptance; along with Trust and Perceived Risk to understand mobile banking adoption in Malaysia better. To investigate this issue, the study first adapts and develops an instrument to measure the 10 constructs of the hypothesized model. The instrument is validated via exploratory factory analysis technique from a dataset of 403 individual mobile banking users in Malaysia. The results of the confirmatory factory analysis with AMOS show the construct Perceived Ease of Use, Least Amount of Time, Least Amount of Money, Perceived Usefulness, User Need, Trust and Perceived Risk have significant relationships with Intention to Use and Mobile Banking Adoption however the construct Location has no significance towards the adoption of mobile banking in Malaysia. The study ends by introducing a new mobile banking adoption model.

ABSTRAK

INTEGRASI MODEL PENGGUNA MALAS DAN MODEL PENERIMAAN TEKNOLOGI DALAM PENGGUNAAN PERBANKAN MUDAH ALIH DI MALAYSIA

Dalam dunia yang semakin maju berhubung secara konsisten semasa bergerak, pengguna semakin berkuasa untuk membuat lebih banyak di luar pejabat. Kemunculan telefon pintar yang berkuasa dan tablet mudah alih, bersama-sama dengan teknologi Internet tanpa wayar yang semakin bertambah baik membolehkan pengguna untuk melaksanakan pelbagai tugas-tugas mudah alih yang termasuk perbankan mudah alih. Pengguna tidak lagi terkandas dalam satu lokasi yang tertentu untuk menggunakan komputer atau komputer riba mereka. Terminologi Perbankan mudah alih bermaksud menjalankan perbankan peribadi dengan telefon pintar atau tablet ketika di luar pejabat mereka. Walau bagaimanapun, terdapat rintangan yang tidak dijangka dengan keraguan mengenai pengambilgunaan perbankan mudah alih dan terdapat keperluan untuk memahami faktor-faktor yang mendasari perbankan mudah alih. Kajian ini bertujuan untuk menyiasat dan menyediakan rangka kerja asas untuk diterima pakai pengambilgunaan perbankan mudah alih. Kajian ini meneroka Model Pengguna Malas Model Teknologi Penerimaan bersama-sama dengan Kepercayaan dan Persepsi Risiko untuk memahami pengambilgunaan perbankan mudah alih yang lebih baik. Untuk menyiasat isu ini, langkah pertama untuk kajian ini adalah untuk membangunkan instrumen untuk mengukur 10 konstruk model yang dihipotesiskan. Instrumen ini disahkan melalui analisis faktor penerokaan dari dataset 403 pengguna individu perbankan mudah alih di Malaysia. Hasil analisis faktor pengesahan dengan perisian Amos menunjukkan konstruk Persepsi Mudah Guna, Penggunaan Masa Minima, Penggunaan Wang Minima, Persepsi Kegunaan, Keperluan Pengguna, Kepercayaan dan Persepsi Risiko mempunyai hubungan yang signifikan dengan Niat Untuk Menggunakan dan Penggunaan Perbankan Mudah Alih kecuali konstruk Lokasi tiada hubungan signifikan dengan perbankan mudah alih di Malaysia. Kajian berakhir dengan memperkenalkan model pengambilgunaan perbankan mudah alih yang baru.

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ABBREVIATIONS

2G	–	Second Generation Mobile Telecommunications
3G	–	Third Generation Mobile Telecommunications
4G	–	Fourth Generation Mobile Telecommunications
ACM	–	The Association for Computing Machinery
CAD	–	Computer Aided Design
CAM	–	Computer Aided Manufacturing
CASE	–	Computer Aided Software Engineering
DSS	–	Decision Support System
EDGE	–	Enhanced Data for GSM Evolution
GPS	–	Global Positioning Satellite
GPRS	–	General Packet Radio Service
GSM	–	Global System for Mobile Communication
GUI	–	Graphical User Interface
HSPDA	–	High Speed Downlink Packet Access
IS	–	Information System
IT	–	Information Technology
MIS	–	Management Information System used interchangeably with IS and IT
MS	–	Microsoft
OS	–	Operating System
PDA	–	Personal Digital Assistant
SIGCHI	–	Special Interest Group Computer Human Interaction
WAP	–	Wireless Application Protocol

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CHAPTER 1

INTRODUCTION

1.1 Overview of the Study

The purpose of this study is to investigate the factors that are affecting the relatively low adoption rate of mobile banking in Malaysia. That is, the usage of mobile application or applications to access a user's banking services. In depth details of these factors would be discussed as the study examines their relationships and their significance. Previous studies done on the subject of mobile banking adoption as well as Internet banking would be explored to investigate on their differences and similarities.

Mobile banking is not new. Back in 1997-1999 when the first Wireless Application Protocol (WAP) was launched and it was hailed as the biggest leap forward in mobile technology (Linder, 1998). WAP allows mobile devices such as mobile phone or PDA to access parts of the Internet via a wireless communication; it even has a built in mini browser. However, there are various obstacles for WAP such as high usage cost, lack of applications, and low transfer speed or bandwidth. Regardless, the most significant two obstacles for WAP are market acceptance… and the technical uncertainty of an untested and untried system (Chen and Yang, 1998). The inability of WAP to meet consumer expectation on its user experience similar to a desktop computing experience spelt the demise of WAP banking. The question is, would the current mobile banking phenomena share similar ends as WAP despite the advancement of transfer speed and technology?

Many unknown factors and variables play a role in answering this question. This study aims to investigate the prominent factors and variables affecting mobile banking usage in Malaysia.

Masrek, Uzir and Khairuddin (2012) said even though there are increasing number of retail banks providing mobile banking services, the adoption rate among consumers is still very low. One of the critical issues identified by researchers is the aspect of trust.

Ki, Hyung and Sang (2007) said mobile banking services are still in their infancies and that these services have a great deal of room for improvement. Thus there is a need to study and understand users' acceptance of mobile banking services in order to identify the factors affecting their intention to use mobile banking.

According to AlHinai, Kurnia and Johnston (2007) said there is a lack of a complete understanding of the roles that mobile commerce adopters play. Such understanding will allow both researchers and practitioners to gain better insights on the factors that influence mobile commerce adopter's intentions. Hence, there is a need to study and understand users' acceptance of mobile banking services in order to identify the factors that are affecting their adoption rate.

In this study, the identified factors that are crucial to determine mobile banking adoption are Technology Acceptance Model's perceived usefulness and perceive ease of use, Lazy User Model's principle of least effort, user need and user state; as well as perceived risk and trust. By incorporating these concepts, this study aimed to better understand the mobile banking adoption in Malaysia.

Following Table 1.1 is summarized from BNM's Statistics on Internet banking and mobile banking in Malaysia that shows Malaysia's online banking penetration rate.

Table 1.1: BNM's Statistic of Internet and Mobile Banking Usage in Malaysia

Year	2005	2006	2007	2008	2009	2010	1Q2011
Number of mobile subscribers	127.6k	246.7	345.7k	529.6	628.6k	773.8k	946.3k
Mobile Banking penetration (%)	0.5	0.9	1.3	1.9	2.2	2.4	2.7
Internet Banking penetration (%)	9.7	11.9	16.6	21.8	28.1	33.4	35.9

Source: Bank Negara Malaysia (2011)

The low adoption rate as indicated by Bank Negara Malaysia refers to the low adoption increment rate that is to imply the adoption rate is increasing but it is increasing at a low rate as compared to the Internet Banking in Table 1.1.

The Nielson Company reported that there are 13 million American mobile banking users as of 2010 that is approximately 4.2% of the whole American population. In the United Kingdom, Jupiter Research reported that there are three million mobile banking users in the UK in 2010 which is approximately 4.8% of the entire population. Comparatively, as evident on the figures published by BNM on Table 1.1, Malaysia has an approximately 2.4% mobile banking users as of 2010; that is half of the penetration rate of United Kingdom and almost half of those in United States of America

According to Consulting Group to Assist the Poor (CGAP), by the year 2012 there is an estimate of 1.7 billion people with a mobile phone but not a bank account and as many as 364 million unbanked people could be reached by agent-networked banking through mobile phones.

Banks have been trying to extend their services through Internet banking and mobile banking. Banks are also increasingly working with local telecommunication operators to ensure safer, faster and more enjoyable experience for their mobile customers. As a result, some progress has been made in the applications, frameworks, networking requirements, and business models. However, few of the major issues that have not been addressed so far is the usability of mobile banking and the factors that are affecting the adoption rate of mobile banking.

1.2 Problem Statement

Mobile commerce or M-commerce is defined as any direct or indirect transaction with a potential monetary value conducted via wireless telecommunication channels or networks (Wu and Wang, 2005). M-commerce is the subset of E-commerce. However there are major differences between E-commerce and M-Commerce such as the interactions style due to the limitation of the device used and the usage patterns is different from those of traditional desktop computers (Feng, Hoegler and Stucky; 2006). Therefore, mobile banking is a subset of mobile commerce.

Goldfinger (2002) mentioned that mobile banking is in development phase in most countries where there are small markets with few users due to the lack of consumer acceptance and the slow process of the service.

According to AlHinai *et al.* (2007), among the functionalities of using mobile commerce services are sending or receiving emails, download music or graphics or animations, shop for goods and services, play interactive online games, trade stocks, book tickets, find friends, conduct financial and banking transactions and so on. AlHinai *et al.* (2007) added that mobile commerce has been a huge success in terms of individual's adoption in some markets like Japan, while not as flourishing in others. Further studies should be done to investigate mobile commerce adoption in Malaysia because this phenomenon may not be same for the rest of the Asian countries because Japan has been the biggest economy in Asia until recently; which has been overtaken by China.

Since the inception of mobile banking by Bank Islam in 2004 followed by Maybank in 2006, there has been a great deal of marketing and publicity about it. In order to remain competitive, other major banks follow suit and launched their respective mobile banking services by 2008. To date, banks in Malaysia are still launching their own respective mobile banking platform. As of the writing of this report, there are currently 13 banks in Malaysia that are given the green light to operate mobile banking services by Bank Negara Malaysia (BNM, 2016).

Barati and Mohammadi (2009) mentioned that one of the major factors that are hindering the growth of mobile banking is the lack of consumer acceptance and the slow process of the service. On top of that, they have identified five barriers that will be the innovation resistance towards the final adoption of mobile banking which are usage barrier, value barrier, risk barrier, tradition barrier and image barrier.

The presence of the Internet and the mobile banking arena spelt the absence of the physical dimensions usually associated with banking users and queuing in banks. Convenience as we know it does come at a price; it is the amount of risk we are willing to accept. The spatial and temporal separation between a banking customer with his handheld and the mobile banking websites coupled with the unpredictability of the Internet infrastructure generated an implicit uncertainty around online transaction (Brynjolfsson and Smith, 2000). However, little is known about the actual weight consumers place on their individual perceived risk when conducting a mobile banking transaction in Malaysia. Moreover, Wong, Loh, Turner, Bak and Yap (2009) said that with the advancement of technology; banks are beginning to strive on mobile banking services; therefore the elements of trust and perceived risk should be investigated in that context.

Undoubtedly, Technology Acceptance Model (TAM) has been extensively tested in various industries remotely connected to Information Technology including mobile banking. Various researchers chose TAM based on its parsimony and predictive power which make it easy to apply in different information system devices. Researchers have modified TAM to adapt it in their studies with various

additional constructs such as perceived risk, perceived trust, perceived credibility, awareness, normative pressure and so on. (Ki *et al.,* 2007, Amin, 2007; Amin, 2010; Amin, Hamid, Lada and Anis, 2008; Guriting and Ndubisi, 2006; Pikkarainen, Pikkarainen, Karjaluoto and Pahnila, 2004; Kleijnen, Wetzels, Ruyter, 2004; Venkatesh and Morris, 2000; Rigopoulous and Askounis, 2007). However, previous researches left some questions unanswered that are the convenience, cost and mobility factor that can be answered by integrating TAM and Lazy User Model (LUM). Chen (2008) who combined TAM and Innovation Diffusion Theory (IDT) on mobile payment industry suggested that future study on mobile payment should delve into transaction convenience among other factors. Fredriksson (2009) suggested that LUM could be used in larger setting and additional research into the model and the attitudes of users is needed.

1.3 Research Questions

Following are the research questions derived from the problem statements:

i. Is there a significant relationship between TAM (Perceived Usefulness and Perceived Ease of Use) and Intention to Use on Mobile Banking Adoption in Malaysia?

ii. Is there a significant relationship between LUM (Least Amount of Effort is the same as Perceived Ease of Use, Least Amount of Time, Least Amount of Money, User Need and Location) and Intention to Use on Mobile Banking Adoption in Malaysia?

iii. Is there a significant relationship between Perceived Risk, Trust and Intention to Use on Mobile Banking Adoption in Malaysia?

1.4 Research Objectives

Ki *et al.* (2007 mentioned mobile banking is still in their infancy and there are limited empirical researches on the factors that are affecting the adoption of mobile banking specifically. Hence, there is a need to study and understand users' acceptance of mobile banking services in order to identify the factors affecting their

intention to use mobile banking (Ki *et al.,* 2007). TAM has been used extensively in various computing industry but somewhat new and untested in the mobile banking industry (Meister and Compeau, 2002).

On the other hand, LUM has been formulated for the sole purpose of finding the most efficient means to fulfill whatever need, whenever the need arises and however urgent the needs is; in this case by identifying an individual's usability and acceptability of mobile banking adoption. By merging the concepts of these two models, the research framework would be comprehensive enough to answer questions on the factors that are affecting mobile banking adoption rate in Malaysia.

Due to the absence of a physical bank during any form of banking transactions or services, the concepts of trust and perceived risk played an even stronger role in mobile banking. Yousafzai, Pallister and Foxall (2003) reported that there is a gap in the marketing and financial services literature in the element of trust and perceived risk in electronic banking. The objectives of this study are:

i. To determine whether there is a significant relationship between TAM (Perceived Usefulness and Perceived Ease of Use) and Intention to Use on Mobile Banking Adoption in Malaysia.

ii. To determine whether there is a significant relationship between LUM (Least Amount of Effort which is the same as TAM's Perceived Ease of Use, Least Amount of Time, Least Amount of Money, User Need and Location) and Intention to Use on Mobile Banking Adoption in Malaysia.

iii. To determine whether there is a significant relationship between Perceived Risk, Trust and Intention to Use on Mobile Banking Adoption in Malaysia.