USER ACCEPTANCE OF INTERNET BANKING IN PENANG: A MODEL COMPARISON APPROACH

By

OH SOOK MAY

Research report submitted in partial fulfillment of the requirements for the degree of Master of Business Administration

MAY 2005

UNIVERSITI SAINS MALAYSIA

HIGHLY CONFIDENTIAL

January 2005

Dear Respondent,

The present research is intended to understand user acceptance of Internet banking in Penang. This is purely an academic study that is undertaken to fulfill the partial requirement for the degree of Masters of Business Administration at the University Science Malaysia.

Please complete the questionnaire based on your honest opinion. There are no right or wrong answers. Some of the questions may seem similar to one another, but each question addresses a unique issue. Please make your full effort to answer each question.

We guarantee complete **anonymity** and **confidentiality** of the information provided by you. We are mainly interested in your opinion. We would, therefore, value your kind assistance and valuable time in completing the attached questionnaire and returning directly to me or the person through whom you received the questionnaire. Should you have any concerns or clarifications, please do not hesitate to contact us at 012-4252832 (May), 04-6533888 ext. 3889 or message 3363 (Associate Professor T. Ramayah).

Thank you very much for your valuable time and assistance in completing this questionnaire.

Yours faithfully

Oh Sook May
MBA Student
maysmoh@yahoo.com

Associate Professor T. Ramayah
Supervisor
ramayah@usm.my

ACKNOWLEDGEMENT

I would like to take this opportunity to express my heartfelt appreciation to my project supervisor, Associate Professor T. Ramayah for his invaluable and genuine attention throughout the research work. Also, I would like to express my gratitude to Professor Icek Ajzen, Melissa, Gopi and my classmates for the assistance provided.

Not to forget to thank my family, especially my parents for the understanding and encouragement during the period of study. Although my father has left us in April 2005, but his understanding and caring will last forever.

Last but not least, I would like to thank those respondents who spent time and effort to complete the questionnaires and those who helped in distributing the questionnaires. They have made this study possible.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRAK

Perbankan Internet telah menyerapi kehidupan kita dan mengancam tradisi institusi kewangan. Maka, terciptanya satu prospek perniagaan besar di kalangan institusi kewangan untuk menjadikan perbankan Internet sebagai satu saluran penghantaran baru dan mengkaji penerimaan perbankan Internet di kalangan pelanggan. Kajian ini mengkaji faktor-faktor utama yang mempengaruhi keinginan penggunaan perbankan Internet di Pulau Pinang. Tiga model perbankan Internet yang popular, iaitu "Theory of Reasoned Action" (TRA), "Theory of Planned Behavior" (TPB) dan "Technology Acceptance Model" (TAM), telah dikaji dan dibanding. Kertas soal selidik digunakan dalam mengumpul data dan 239 individu memaklumbalas kajian ini, memberi keputusan bahawa perlakuan terhadap sikap, norma subjektif, tanggapan kawalan perlakuan, tanggapan kebergunaan, dan tanggapan senang guna mempunyai kesan positif ke atas keinginan penggunaan perbankan Internet. Tetapi perlakuan terhadap sikap mempunyai beta yang tertinggi, diikuti oleh tanggapan kebergunaan, norma subjektif dan sebagainya. Dalam menguji kuasa penerangan model-model tersebut, kita dapati bahawa model TRA mempunyai kuasa penerangan yang tertinggi, diikuti dengan model TPB dan TAM.

ABSTRACT

Internet banking has pervaded our lives and threatened the very existence of the traditional financial institution. There is a big business prospect for financial institutions to consider making Internet banking as a new delivery channel and to study the acceptance of customers to Internet banking. This study investigates the dominant factor(s) that influence the user intention to use Internet banking in Penang. Three popular models; Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Technology Acceptance Model are examined and compared. Structured questionnaire is used to collect data and 239 individuals respond in the study, giving the results that the independents variables; attitude toward behavior, subjective norm, perceived behavioral control, perceived usefulness and perceived ease of use are having a direct positive effect on behavioral intention to use Internet banking. However, attitude toward behavior has the highest beta, follow by perceived usefulness, subjective norm, and others. In testing the explanatory power of the different models, we conclude that TRA model has the best explanatory power, follow by TPB and TAM models.

Chapter 1

INTRODUCTION

1.1 Introduction: Overview of Internet Technology

The Internet is rapidly becoming the infrastructure of choice for electronic commerce because it offers businesses an even easier way to link with other businesses and individuals at a very low cost. It provides a universal and easy-to-use set of technologies and technology standards that can be adopted by all organizations, no matter what computer system or information technology platform the organizations are using (Laudon, 2003, pp. 116-117). The low cost connectivity and universal standard provided by Internet technology are the driving forces behind the explosion of electronic business and electronic commerce.

The Internet has introduced major changes in the way companies conduct business. It is making information widely available while dramatically reducing the cost of developing, sending, and storing information. In the past, when a customer wanted to find out about the specification of a product, such as the features, price and the availability of stock, he or she had to visit a retail store that sold that particular product. In short, the Internet is essentially another kind of distribution channel for customers and a new way of adding value to the services provided (www.pwc.com).

According to Nielsen//NetRatings, the global Internet population for first quarter of 2002 in rank is United States, China, Japan, Germany, and United Kingdom with total Internet population of 166 million, 56.6 million, 51.3 million, 32.2 million, and 29.0 million respectively. Internet World Stats reported that there were 8.7 million Internet users in Malaysia (presenting 35.3 percent of the population) in May 2004, up from 7.8 million in June 2003 (Internet World Stats, May 2004).

The Internet and Wireless technology have created a paradigm shift in the banking industry – from brick and mortar banks to banking virtually across time zones, geographic location, access points and delivery channels. This trend has created new competitive threats as well as new customers' opportunities. Banks and other traditional financial institutions are finding new ways to add value to their products and services, gain competitive advantage and increase customer loyalty, such as offering Internet banking, where a customer can pay bills while stuck in a jam, receiving notification of change of interest rate while having lunch and buying stock through ATM (Automated Teller Machine) without having to fill up forms. Datamonitor, a research company (www.nua.com) forecasted that there would be 84 million Internet banking customers in Europe by 2007. The United Kingdom and Germany are Europe's biggest online banking although the Scandinavian markets have the most Internet bankers per head of the population.

However, building an Internet banking solution is complex, and requires advanced technical skills to bring successful solution to market quickly. Financial institutions system, customer resistant of switching to Internet banking due to security and privacy issues, and integration issues are needed to overcome to ensure the seamless flow of information between the banking system and customers. Robinson (2000) found that half of the people that have tried online banking services would not become active users.

1.2 Background of the Study

Internet technology has pervaded our lives, from the development arising from advances in information and communication technology to bringing about compelling changes to the financial landscape that threatening the very existence of the traditional

financial institution. Recently, our Prime Minister, Datuk Seri Abdullah Ahmad Badawi is encouraging Malaysian to build up knowledge-workers (k-workers) for the information and communication technology (ICT) and biotechnology companies to ready for the likely strong demand in the future (Bernama.com, 2004).

The Internet banking was started up late in Malaysia. Only on June 1, 2000, the Malaysian Central Bank provided the first legal framework for domestic commercial banks to offer Internet banking. Foreign banks were only allowed to engage in Internet banking until January 1, 2002. The launching of Maybank2u.com on June 15, 2000 by MAYBANK Berhad indicated the first domestic bank to offer a comprehensive list of banking services through the Internet. Currently, only banking institution licensed under the Banking and Financial Institution Act 1989 and the Islamic Banking Act are allowed to offer Internet banking services in Malaysia.

Internet banking allows customers to perform banking transactions electronically via the bank's Web site. Initially, Internet banking was only used as an information presentation medium in which banks marketed their products and services. Later, with the rapid development in secured electronic transaction technologies, Internet banking was further used as a transactional medium. The banking services provided include banking enquiry functions, bill payment, credit card payment, funds transfer, and account summary and transaction history.

Today, there are a total of twenty-three (23) commercial banks in Malaysia, where ten (10) are locally owned and thirteen (13) are foreign banks. As of May 20, 2002, eight (8) domestic banking groups are offering the full range of banking services through the Internet and four (4) foreign banks are offering transactional Internet banking services according to Dr. Zeti Akhtar Aziz, Governor of the Central Bank of Malaysia.

According to Stephanie Wong, Senior Analyst of International Data Corporation (IDC) Malaysia, "Key reasons for the growth are the government's drive to encourage Internet usage in the rural areas and schools. These are among other initiatives that the government is leading. The introduction of ADSL and Wireless LAN hotspots as well more competitive pricing for dial up and broadband prices are also key to the increase of Internet users in Malaysia." Therefore, there is a big business prospect for financial institutions to consider making Internet banking as a new delivery channel and to study the acceptance of customers to Internet banking.

In our review of literatures, we found that the intention to use Internet banking is influenced by various factors. Three models that consist of these factors are used to explain and predict the behavioral intention; they are Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), Theory of Planned Behavior (TPB; Ajzen, 1985) and Technology Acceptance Model (TAM; Davis, 1989).

This paper aims to determine the determinants (attitudes towards behavior, subjective norm, perceived behavioral control, perceived usefulness and/or perceived ease of use) of user acceptance to use Internet banking and also to examine and compare TRA, TPB and TAM models in predicting the behavioral intention to use Internet banking among users in Penang, Malaysia.

1.3 Problem Statement

Internet banking provides users with a fast and convenient way to undertake various banking transactions from the comfort of home, office or at any where and at any time, during or after banking hours. The Internet banking service is 24 hours a day

and 7 days a week. Time can be saved as the users do not have to travel and wait in queues to pay bills or access other banking services.

However, despite of the numerous benefits, the acceptance of Internet banking in Malaysia is relatively low when comparing to Europe and United States (www.asli.com.my). In general, Europe has been and still is the leader in online banking technology and usage (Schneider, 2001). Therefore, efforts are needed to understand the determinants of Malaysian users in adopting Internet banking.

Besides, various researches have been conducted to determine the determinants of user acceptance in Malaysia (Ndubisi et al., 2001; Ndubisi & Jantan, 2003; Ramayah et al., 2002a; Ramayah & Jantan, 2003b; Ramayah et al., 2003e) and recent studies in technology acceptance have focused on comparisons of TRA, TPB and TAM. Studies comparing TRA and TPB showed the latter to be a better predictor of behavioral intention (Ajzen & Madden, 1986). Empirical results found that both TPB and TAM exhibited considerable predictive power for adoption intentions, while TAM could predict attitude better than TPB (Mathieson, 1991). TAM when compared with TRA, also explained a larger variance in adoption intentions (Davis et al., 1989). Mathieson (1991) also found that TAM's ability to explain attitude toward using an information system is better than TRA and TPB. In short, TRA is found only applicable to behavior under total volitional control. While TPB can provide insight into influence of behavior toward technology, TAM might be easier to use due to its parsimonious structure (Mathieson, 1991).

This study is needed as there are not many empirical research conducted in Malaysia to assess the acceptance of Internet banking and models among users. The key questions are "What are the determinants of Malaysian user acceptance of Internet banking?" and "Which is the best model in explaining and predicting user acceptance

of Internet banking?". We use behavioral intention as dependent variable for both theoretical and practical reasons as it has emerged as a common anchor for examining technology acceptance and adoption. The three models (TRA, TPB, and TAM) in the comparative study are based on behavioral intention.

1.4 Objectives of Study

This study aims to compare three models. Firstly, TRA that focuses that beliefs and evaluation of outcomes influence attitude and attitude in turn shapes intention. Secondly, the TPB and thirdly the TAM. TPB and TAM are derived from TRA and identifying the determinants that influence the user intention in accepting Internet banking, such determinants are attitude towards the behavior, subjective norm, perceived behavioral control, perceived usefulness and perceived ease of use.

Generally, the study focuses on two (2) objectives as follows: -

(a) To determine the dominant factor(s) which influence the user intention to use Internet banking.

(b) To examine which model (TRA, TPB or TAM) is better in explaining and predicting the intention to use Internet banking.

1.5 Research Questions

This research attempts to answer the following questions that will be investigated in the study: -

(a) What are the determinants of user intention to accept Internet banking? There are various factors explained to have influence user intention to use Internet banking in previous research, we would like to see whether they apply on Penang users.

(b) Which model (TRA, TPB or TAM) can better explain and predict the intention to use a system? We select behavioral intention, as our dependent variable over actual usage, although intention is not the actual behavior, intention by itself is capable of explaining why people choose to use or not to use a system.

1.6 Significance of the Study

Today, the trade liberalization (globalization) and the rapid advancement of technology are the driving forces that influence the pattern and structure of businesses. Consumers keep on emphasizing speed and conveniences and would prefer a fast and convenient way to undertake various banking transactions besides safety and security issues. With this trend, the need to explore into electronic commerce and the need for learning consumer behavioral intention have also increased.

The understanding of consumer behavioral intention is vital in strategizing the marketing plan for a product or service. The focuses of this study are to identify the determinants of user acceptance of Internet banking among the users in Penang and which model (TRA, TPB or TAM) has the best explanatory power in predicting and explaining user acceptance of Internet banking. The results of the study will contribute to marketing and strategizing the position of Internet banking in Malaysia.

1.7 Definition of Key Variables

There are several key variables in the present study. They are defined as follows: -

(a) Attitude is defined as an individual's positive or negative feeling (evaluative effect) about performing the target behavior (Ajzen & Fishbein, 1980). A person who strongly believes that positive outcomes will result from

performing a particular behavior will have positive attitude towards that behavior.

(b) Subjective Norm refers to the person's belief that specific individuals or groups think he should or should not perform the behavior and his motivation to comply with the specific referents (Ajzen & Fishbein, 1980).

(c) Perceived Behavioral Control concerns with the perceived ease or difficulty of performing the behavior. Perceived behavioral control may accurately reflect actual control postulating a direct link between control and intention.

(d) Perceived Usefulness refers to the degree to which an individual believes that using a particular system would enhance his or her productivity (Davis, 1989).

(e) Perceived Ease of Use refers to the degree to which an individual believes that using a particular system would be free of effort (Davis, 1989).

(f) Behavioral Intention is a measure of the strength of one's intention to perform a specified behavior. It also determines whether the person is intent or not intent to perform the actual behavior.

1.8 Organization of the Dissertation

This report is organized into five chapters. Chapter 1 gives the background of the study. The purposes and the research objectives have been put forth to guide the direction of the study. Chapter 2 reviews the relevant literatures on outlining the concept and construct of user acceptance of Internet banking. A theoretical framework, hypotheses, and some of the related empirical studies on technology acceptance are also presented in the chapter. Chapter 3 discusses the research methodology used in the study. Research sampling design and techniques, variables and measurement, data collection method, the questionnaire design and the data

analysis are also included in the chapter. Chapter 4 devotes the results of the study. Chapter 5 discusses the findings, the limitation and implication as well as suggestions for future research and conclusion of this study.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

Internet banking refers to performance of electronic banking transactions or services via the bank's Web site. The banking services include banking enquiry functions, bill payment, credit card payment, funds transfer, and account summary and transaction history. Currently, banks have used Internet banking both as a transactional as well as information medium.

According to Guru, Vaithilingam and Prasad (2001), most Malaysia users patronize bank branches and find human interaction with bank tellers as important. Sohail and Shanmugham (2003) in investigating the customer preferences of Internet banking in Malaysia discovered that accessibility of Internet, awareness of Internet banking, and customers' reluctance to change were the factors that significantly affected the usage of Internet banking in Malaysia.

Considerable researches have been conducted to explain and predict behavioral intention. TRA, TPB, and TAM models are popular in the research study. TRA is widely used in consumer behavior research, whereas TPB and TAM are the specific adoption of the TRA model to study of information technology (IT) usage (e.g. Internet banking).

Previous researches indicated that behavioral intention was determined by the person's beliefs and attitude. Ajzen and Fishbein (1980) found that strong attitude (behavioral correspondence) depended on congruence of accessible beliefs in the attitudinal and behavioral context. Within their framework, the TRA and TPB are found to be very useful tools for predicting and understanding complex social

behavior. Whereas the TAM has been validated as a powerful and parsimonious framework for explaining the adoption of IT by the users (Davis, 1989).

2.2 Theory of Reasoned Action (TRA)

Fishbein and Ajzen (1975) introduced the TRA in an attempt to establish a relationship among beliefs, attitudes, intentions, and behavior. It is a widely studied model from social psychology, which is concerned with the determinants of consciously intended behaviors (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). In TRA, two unique factors that contribute to intended behavior or behavioral intention are determined: attitude toward the behavior and subjective norm. According to Ajzen and Fishbein (1980), in order to gain deeper understanding of the factors influencing behavior, it is required to look into beliefs individuals hold about themselves and their environment. Therefore, beliefs are viewed as underlying a person's attitude and subjective norm, and ultimately determine the intention and behavior.

Ajzen and Fishbein (1980) defined an attitude as an index of the degree to which a person likes or dislikes an object and a person's attitude toward a behavior is determined by the set of salient beliefs he holds about performing the behavior. In order to predict attitude from beliefs, there are four steps as suggested by Ajzen and Fishbein (1980). Firstly, to elicit a subject's salient beliefs. Secondly, to measure how a subject evaluates the outcome of each salient belief. Thirdly, to measure belief strength by asking a subject to indicate the likelihood that performing a behavior will result in a given outcome and lastly, get the outcome by multiplying the product of each outcome evaluation by the corresponding beliefs strength to predict a subject's attitude.

Subjective norm is a function of normative beliefs. Subjective norm is defined as a person's perception that most people who are important to him or her think that he or she should or should not perform the behavior and his or her motivation to comply with the specific referents (Ajzen & Fishbein, 1980). A subject's attitude can be predicted by multiplying the product of each normative belief by the subject's corresponding motivation to comply.

A particularly helpful aspect of TRA from an information system (IS) perspective is its assertion that any other factors that influence behavior do so only indirectly by influencing attitude, subjective norm, or their relative weights (Davis, Bagozzi, & Warshaw, 1989). Thus, variables such as system design characteristics, user characteristics, task characteristics, nature of the development or implementation process, political influences, organizational structure and so on would fall into this category, which Fishbein and Ajzen (1975) refer to as "external variables". This implies that TRA mediates the impact of uncontrollable environmental variables and controllable interventions on user behavior.

In researching user acceptance of computer technology, Davis, Bagozzi, and Warshaw (1989), found that attitude had a strong significant influence on behavioral intention, attitude only partially mediated the effects of beliefs on intention and subjective norms had no significant effect on behavioral intention. Consistently, Shih and Fang (2004) in the comparison of TRA to two versions of the TPB model found that the decomposed TPB model has better explanatory power for behavioral intention, attitude and subjective norm than the TRA and pure TPB model. The path from subjective norm to intention failed to achieve significance in either model, and a further significant determinant of actual use is behavioral intention (Shih & Fang,

2004). The TRA model developed by Fishbein and Ajzen (1975) is shown in Figure 2.1.

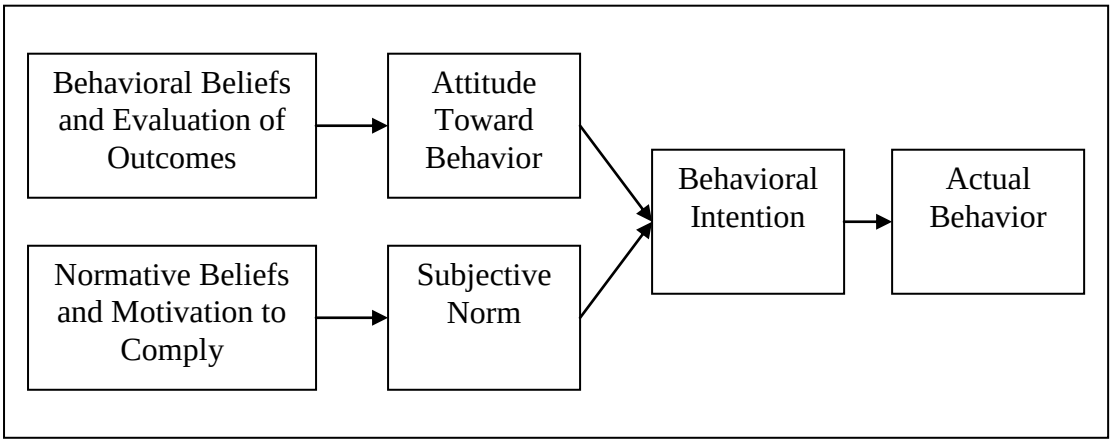

Figure 2.1. Theory of Reasoned Action (TRA).
Source: Fishbein and Ajzen (1975)

2.3 Theory of Planned Behavior (TPB)

The TPB (Ajzen, 1985; Ajzen, 1991) is an extension of the TRA (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980), due to the limitation of TRA to deal with behavior over which individuals have incomplete volitional control (Ajzen, 1991). Like the TRA, the TPB postulates that behavioral intention is a function of attitude and subjective norm, but TPB is added with a new construct, perceived behavioral control to account for situation where individuals lack control over their behavior (Ajzen, 1985; Ajzen, 1991).

Perceived behavioral control refers to the efficacy of the control factor in either inhibiting or facilitating the behavior. Control beliefs reflect the perceived difficulty (or ease) with which the behavior may be affected and perceived facility acts as an important weighting (Ajzen, 1991).

In the case of Internet banking, control beliefs refer to knowing how to perform transaction via Internet banking (self efficacy; Bandura, 1977) and facility

refers to externally resource constraints, such as time, money, and resources. In short, perceived behavioral control measures the perceived ease or difficulty of performing a behavior and it may accurately reflect control postulating a direct link between control and intention. Ajzen and Madden (1986) had used TPB to predict student's decision about attending class and earning a good grade.

In consumer behavior studies, Shim et al. (2001) found that attitude toward behavior, subjective norm and perceived behavioral control significantly influence the intention to use the Internet for information search. In the research of Internet purchasing, George (2004) in using TPB as basis, found that beliefs about self-efficacy of using the Internet for consumer purchases directly affected perceived behavioral control and perceived behavioral control in turn directly affected online purchasing behavior. However, Shih and Fang (2004) in their study of Internet banking in Taiwan found that in the pure TPB model, the path from perceived behavioral control to intention failed to achieve significance.

Another research in Singapore by Tan and Teo (2000) indicated that the intention to adopt Internet banking services could be predicted by attitudinal and perceived behavioral control factors, but not by subjective norms, while they used TPB and innovation diffusion theory to study intention toward adopting Internet banking. This is consistent with the results of Chau and Hu (2001) in studying the IT acceptance by individual professionals (physicians) at public tertiary hospitals in Hong Kong. The TPB model developed by Ajzen (1985) is as shown in Figure 2.2.

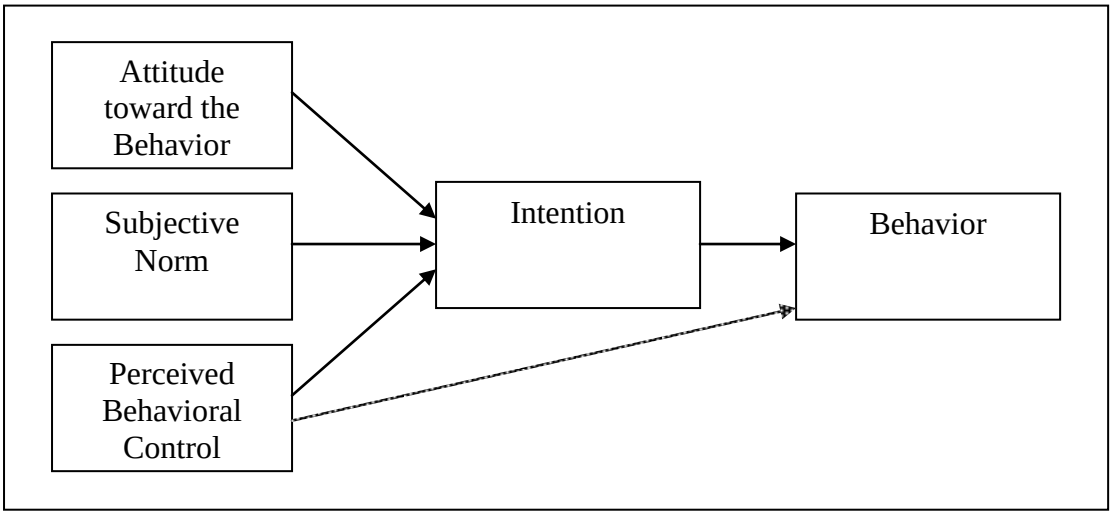

Figure 2.2. Theory of Planned Behavior (TPB).
Source: Ajzen, 1985

2.4 Technology Acceptance Model (TAM)

The TAM, which was developed by Davis (1989), has been used extensively in research that looks at the acceptance of new technology (Davis, 1989; Venkatesh, 1996). The TAM is actually derived from or outgrowth of TRA and TPB. The basic goal of TAM is to provide an explanation of the determinants of technology acceptance that are capable of explaining user behavior across a broad range of end users technologies and user populations, while at the same time, being both parsimonious and theoretically justified (Davis et al., 1989).

According to TAM, there are two important determinants of attitude toward usage intention and actual technology usage; they are perceived usefulness and perceived ease of use. Perceived usefulness is defined as the extent to which a person believes that using a particular system will enhance his or her job performance, while perceived ease of use is defined as the extent to which a person believes that using a particular system will be free of effort. Between these two determinants, perceived ease of use has found to have a direct effect on both perceived usefulness and

technology usage (Davis, 1989; Adam, Nelson & Todd, 1992; Jantan et al., 2001; Ramayah et al., 2003a; Ramayah et al., 2003b; George, 2004). TAM states that perceived usefulness and perceived ease of use will influence behavioral intention to use a technology through attitude as the mediating variable, as per Figure 2.3.

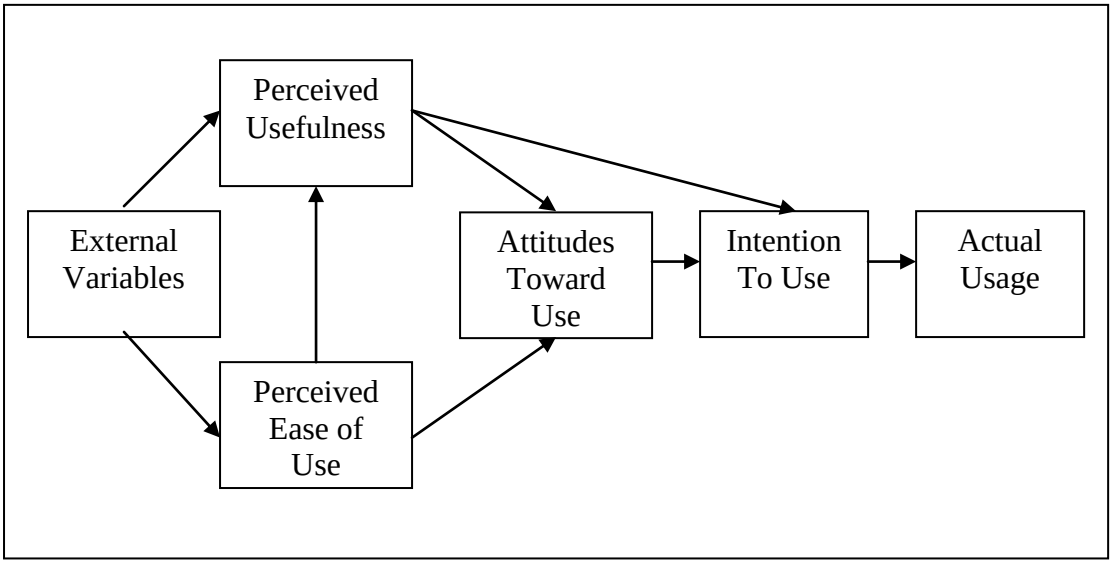

Figure 2.3. Technology Acceptance Model (TAM).
Source: Davis, 1989

Many researches have adopted and expended the model, which was empirically proven to have high validity (Davis, 1989). The empirical evidence indicates that increasing the perceived ease of use of a particular system will increase the perceived usefulness of the system and affect positively the attitude and translate into an increased behavioral intention, resulting in a large margin of actual usage or technology acceptance. Davis, Bagozzi, and Warshaw (1989) in studying user acceptance of computer technology found that perceived usefulness had a very strong effect toward behavioral intention in time 1 (beginning of the semester) and time 2 (14 weeks later from time1), while attitude toward using had a smaller effect in time 1 and a non-significant effect in time 2, perceived ease of use has a significant direct effect on behavioral intention over and above attitude toward using and perceived

usefulness in time 1 but not time 2. Hence, attitude appears to mediate the effects of beliefs on intention even less that postulated by TRA and TAM.

However, Chau and Hu (2001) in their study of information technology acceptance among professionals found that perceived usefulness was the most significant factor for physicians' acceptance of telemedicine technology but perceived ease of use was not found to have any significant effects on perceived usefulness or attitude. This is consistent with the findings of Pikkarainen et al. (2004) in Finland. Pikkarainen et al. (2004) studied the effect of TAM (perceived usefulness and perceived ease of use) and four other variables (perceived enjoyment, information on online banking, security and privacy, and the quality of the Internet connection) on online banking and they found that only perceived usefulness and amount of information clearly have a positive effect on the use of online banking. The rest of the variables were not supported by the data. Wang et al. (2003) introduced "perceived credibility" as a new factor in TAM model to reflect the user's security and privacy concerns in the acceptance of Internet banking. Their findings strongly support the appropriateness of using extended TAM to understand user acceptance of Internet banking.

There are also several researches done in Malaysia relating to TAM. Ndubisi, Jantan and Richardson (2001) used TAM to find that IT usage was influenced by perceived usefulness and indirectly by perceived ease of use, and there was no direct relationship between perceived ease of use and usage. However, Ramayah et al. (2002) found that perceived ease of use and perceived usefulness influenced technology usage among owners or managers of Malaysia SME's.

Furthermore, Jantan, Ramayah, and Chin (2001) used the refined TAM model to study the various factors influencing personal computer acceptance by small and

medium size companies. Fok (2001) used TAM incorporate with self-efficacy and its determinants as influencing factors to study the affecting perceived usefulness, perceived ease of use and the use of Internet. Ndubisi and Jantan (2003) used TAM model to evaluate information system (IS) usage in Malaysian small and medium sized firms. Ramayah et al. (2003) used TAM model to find the receptiveness of electronic banking by Malaysian consumers. They found that perceived ease of use and perceived usefulness to be significantly related to intention and perceived usefulness to be a better predictor of intention when compared to ease of use.

2.5 Key Elements of Study

2.5.1 Attitude

Attitude is defined as an individual's positive or negative feeling about performing a target behavior (Fishbein & Ajzen, 1975). Attitude is traditionally prescribed as psychological tendency that is expressed by evaluating the degree of favor or disfavor of a particular entity. It has long been identified as a cause of intention, as people form intention to perform a certain behavior toward which they have positive effect. The attitude-behavioral relationship is fundamental to TRA, TAM and related models presented by Bagozzi (1981).

In the TRA and TPB models, attitude toward a behavior is determined by the total set of accessible behavioral beliefs linking the behavior to various outcomes and other attributes. Specifically, attitude is the summation of the strength of each belief weighted by the evaluation of the outcome or attribute. In this case, belief is defined as the individual's subjective probability that performing the target behavior will result in consequence. The evaluation term refers to "an implicit evaluative response" to the consequence (Fishbein & Ajzen, 1975).

However, in the TAM, attitude toward use is defined as the mediating affective response between usefulness and ease of use beliefs and intention to use a target system. In short, a prospective user's overall attitude toward the use of a given system is an antecedent to intention to adopt (Davis, 1989). In user participation research, users are likely to have vaguely form beliefs and attitudes concerning the system to be developed prior to the system development (Hartwick & Barki, 1994).

2.5.2 Subjective Norm

An individual's subjective norm is determined by a multiplicative function of his or her normative beliefs and motivation to comply with these beliefs (Fishbein & Ajzen, 1975). Normative beliefs refer to the perceived expectation of specific referent individuals or group, such as the person's spouse, family, friends, and other relevant personnel. The motivation to comply with each referent contributes to the subjective norm in direct proportion to the person's subjective probability that the referent thinks the person should perform the behavior in question.

Subjective norm has been found to be more important prior to, or in the early stages of innovative implementation when users have limited direct experience from which to develop attitudes (Hartwick & Barki, 1994). Taylor and Todd (1995) found subjective norm is a better predictor of intention with inexperienced subjects. Venkatesh and Davis (2000) in the other hand, found that subjective norm significantly affecting intention under mandatory situation and it weakened over time. However, Shih and Fang (2004) found that the path from subjective norm to intention failed to achieve significance in their study. In term of a consumer-oriented service, individual's adoption is largely influence by the consumer-relevant groups around the individual.

2.5.3 Perceived Behavioral Control

Perceived behavioral control measures the perceived ease or difficulty of performing the behavior. It is influencing people decision in choosing to pursue an outcome, their degree of preparation, effort, perseverance, thought and emotions experienced during the task (Bandura, 1982).

There are two components in perceived behavioral control. The first component is self-efficacy, which is defined as an individual's self-confidence in his or her ability to perform a behavior (Bandura, 1977; Bandura, 1982). The second component is facilitating conditions, which reflects the availability of resources needed to engage in the behavior (Triandis, 1979).

Both components predict behavioral intention. Hill et al. (1986) found that self-efficacy predicts intention to use a wide range of technologically advanced products. Goh (1995) found that intention to use Internet banking in Singapore would be expected to be more inclined as supporting technological infrastructure became easily and readily available (facilitating conditions). George (2004) found that beliefs about self-efficacy regarding purchasing positively affect perceived behavioral control, which in turn affects online purchasing behavior.

In the previous comparison between the TRA and TPB conducted by Ajzen (1991) and Davis (1989), perceived behavioral control is found to be a better predictor of intention. However, perceived behavioral control to intention failed to achieve significance in the pure TPB model in Shih and Fang (2004) study. Ajzen and Madden (1986) claimed that the perceived behavioral control is less likely to be related to intention.

2.5.4 Perceived Usefulness

Perceived usefulness is defined as the individual user's subjective probability that using a particular system will increase his or her job performance within an organization context. Previous researches have provided evidence of the significant effect of perceived usefulness on usage intention (Agarwal & Prasad, 1999; Davis et al., 1989; Venkatesh, 1999; Venkatesh, 2000; Venkatesh & Morris, 2000; Chau & Hu, 2001; Ramayah et al., 2003; Pikkarainen, et al., 2004). TAM posits perceived usefulness has a direct effect on behavioral intention and above attitude. The perceived usefulness-behavioral intention relationship is strongly based on the idea that, people form intention toward behaviors they believe will increase their job performance within an organization, over and above whatever positive or negative feeling may be evoked toward the behavior. Hence, the perceived usefulness-behavioral intention relationship in TAM represents the outcome of direct effect, hypothesizing that people form intention toward using computer system based on a cognitive appraisal of how it will improve their performance.

In the TAM model, perceived usefulness can be affected by various external variables over and above perceived ease of use, perceived usefulness and perceived ease of use is distinct but related constructs. In the previous information system (IS) literature (e.g. Compeau & Higgin, 1995; Compeau et al., 1999; Hong et al., 2001; Wang et al., 2003), one of the external variables, computer self-efficacy has been examined. Bandura (1986), Igbaria and Iivari (1995) postulated that computer self-efficacy affects an individual's computer anxiety, and then influence the perceived ease of use, perceived usefulness and system usage.

2.5.5 Perceived Ease of Use

Perceived ease of use refers to as the degree to which the individual user expects the target system to be free of effort. Extensive researches over the past decade provide evidence of the significant effect of perceived ease of use on usage intention, either directly or indirectly through its effect on perceived usefulness (Agarwal & Prasad, 1999; Davis et al., 1989; Venkatesh, 1999; Venkatesh, 2000; Venkatesh & Morris, 2000).

The Internet banking systems need to be both easy to learn and easy to use, in order to encourage large usage. Stoel and Lee (2003) in their study of student acceptance of web-based courseware found that when introducing the technology, instructors should emphasize how easy the technology is to use and how useful it is in improving grades.

Perceived ease of use is having a significant effect on attitude. Two basic mechanisms by which perceived ease of use influences attitude and behavior are self-efficacy and instrumentality. The easier a system is to interact with, the greater should be the user's sense of efficacy (Bandura, 1982) and personal control (Lepper, 1985) regarding his or her ability to carry out the sequences of behavior needed to operate the system. The direct perceive ease of use-attitude relationship is meant to capture the intrinsically motivating aspect of perceived ease of use (Davis, 1986). Same as perceived usefulness; perceived ease of use is also theorized to be determined by external variables. Examples of external variables are training, documentation, and user support consultant as stated by Davis et al. (1989).

The empirical evidence indicates that increasing the perceived ease of use of the system will increase perceived usefulness and will translate into increased behavioral intention, resulting in a larger margin of technology acceptance (Kamel &

Hassan, 2003). Research also indicates that the influences of perceived ease of use on perceived usefulness diminish over time, as users become proficient with the target system (Chau, 1996; Davis et al., 1989). Therefore, perceived ease of use will have the greatest contribution to user acceptance in the early stage of system development, when users have limited experience with a target system.

2.5.6 Behavioral Intention

According to Ajzen (1985), intention is the cognitive representation of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior. In TPB, the intention is based on attitude toward the behavior, subjective norm and perceived behavioral control, with each predictor weighted for its important in relation to the behavior and population of interest. Behavioral intention is one of the most best or accurate predictors available for individual future behavior (Davis, 1989). Davis (1989) found that both usefulness and ease of use were significantly correlated with usage. However, perceived usefulness had a significantly greater correlation with usage behavior than did perceived ease of use.

Behavioral intention to perform a particular act has been shown to be an interesting variable between attitude and behavior, according to the attitudinal models. As pointed by Ryan (1970), since most human behaviors appear to be volitional control, the best single predictor of a person's behavior will be a measure of the person's intention to perform the behavior. However, Fishbein and Ajzen (1975) cautioned that this does not necessarily mean measure of intention will always correlate perfectly with behavior.

Behavioral intention will change over time; the longer the time interval, the lower will be the correlation between intension and action. Chau (1996) discovered

that perceived near-term usefulness had the most significant influence on the behavioral intention. Perceived long-term usefulness exerted a positive but lesser impact. Besides, Ajzen and Fishbein (1980) found that the number of intervening steps also affects intention stability, the bigger the number, the lower will be the correlation between intention and behavior.

2.5.7 Behavior

Behavior is the manifest, observable response in a given situation, with respect to a given target. Single behavioral observation can be aggregated across contexts and times to produce a more broadly representative measure of behavior (Ajzen, 1985).

From the temporal dimension, behavior can be divided into initial behavior and post-adoption or post-implementation behavior. From the volitional dimension, usage could be mandatory or voluntary (Ajzen & Fishbein, 1980). They also identified three major factors that influent the strength of behavior; the degree to which intention and behavior correspond in their levels of specificity, stability of intention, and the extent to which executing the behavior is completely under the person's volitional control. Among the three factors, correspondence in levels of specificity is the most influential.

2.6 Theoretical Framework

As mentioned in the previous sections, we are interested in determining the factors that influencing the behavioral intention and comparing among the three models to identify the most significant model of explaining and predicting the behavioral intention of using Internet banking in Malaysia. We use the simplify TRA, TPB and TAM as our theoretical framework to examine the differences among the models. We