THE DETERMINANTS OF INTERNET BANKING ADOPTION BY UUM STUDENTS

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ABSTRACT

Two hundred and eighty six questionnaires, which are considered as complete, acceptable and usable, were received from the students of UUM. Questionnaires are developed to examine the major factors considered most important in the process of adopting internet banking by students in UUM. In other words, this study aims to define the major determinants of internet banking adoption by students inside UUM.

The data are analyzed by using SPSS programme. Descriptive and correlation analysis have been applied to determine the significant relationships for all hypotheses at 1 percent level of significance. In addition, factor analysis has also been used to inspect how variables affect each other and to what extent they are interrelated. The findings reveal that all independent variables included in this study namely "Perceived Ease of Use (PEU)", "Perceived Usefulness (PU)", "Perceived Web Security (PWS)" and "Attitude (AT)" have a significant relationship with the dependent variable which is "Intention to Use internet banking (IU)". We also find that there is a significant relationship among independent variables. Percentage and frequency distribution are also used to analyze the respondents' profile.

Acknowledgment

In the name of Allah, Most Gracious And Most Merciful. First and foremost, Allhamdulillah, praises to Allah S.W.T for giving me the will and strength in enduring all the problem in completing this thesis.

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LIST OF ABBREVIATIONS

ATT: Attitude

ATB: Attitude toward Behavior

ATM: Automated Teller Machines

BAFIA: Banking and Financial Institution Act

BI: Behavioral Intention

BNM: Bank Negara Malaysia

EFA: Exploratory Factor Analysis

IB : Internet Banking

IDT: Innovation Diffusion Theory

IT: Information Technology

IU : Intention to Use

OB : Online Banking

P: Probability

PDA: Personal Digital Assistant

PBC: Perceived Behavioral Control

PC: Personal Computer

PEU: Perceived Ease of Use

PU : Perceived Usefulness

PWS : Perceived Web Security

SEM: Structural Equation Model

SN: Subjective Norm

TAM: Technology Acceptance Model

TRA: Theory Of Reasoned Action

TPB: Theory of Planned Behavior

UUM: Universiti Utara Malaysia

CHAPTER ONE

INTRODUCTION

1.0 Background of the Study

In this study, the terms Internet Banking (IB) and Online Banking (OB) are used interchangeably. IB/OB differs from Electronic Banking (e-banking) since the latter is an activity of higher level that encompasses not only IB/OB, but also Mobile Banking, SMS Banking, WAP-Banking, ATM and other types of electronic payment systems not operated through the Internet. This study focuses on IB, because it is considered as the most significant and most popular channel for delivering banking services in the cyber age. Therefore, when we speak about Internet Banking history and its background, we should not ignore that of electronic banking as their history is somehow interrelated and synaptic.

Over the last few decades information technology has affected the banking industry highly and has provided a way for the banks to differentiate their products and services. For more than 200 years, banks were using branch-based operations but the advent of

multiple technologies and applications changed the nature of financial services delivered to customers. For instance, automated teller machines (ATM), displaced cashier tellers, telephones represented by call centers replaced the bank branch, the Internet replaced mail, credit cards and electronic cash replaced bank transactions. The reason was the numerous key advantages that banks could gain by providing electronic banking services. In this way they had lower transaction costs, 24-hour trading, more extended business territory and also increased efficiency in daily banking processes. Today banks are faced with a competitive environment. In order to succeed in such marketplace, they must offer a wide array of products with the latest technology. At present, many banks and financial institutions are actively developing new electronic banking products for their customers throughout the world. Moreover, in early 2001 the bursting of the Internet bubble has created numerous assumptions that Internet services companies have lost their opportunities. The Internet companies and Internet players have been fighting for survival, and most of them have been still experiencing losses. There are still going discussions among practicing managers and academics in reaching a consent in their debate about this new technology: whether the Internet changes the basic way people do business or whether it is just an evolutionary process, offering simply a new distribution channel and communication medium (Moe, 2000).

According to Fensel et al. (2001), the "New Economy" or e-commerce businesses are still at the early life stage. In spite of the collapse of dot.com stock prices in March 2001, Internet usage and e-commerce continued to grow at a fast speed. According to Ariguzo et al. (2006), the US B2C e-commerce returns comparing to US$51 billion in 2001 reached US$70 billion in 2002, i.e., a jump of 37%. It also forecasted that revenues of the e-commerce would increase by 28% to US$90 billion by 2003; by 2004 would occur another increase of 21% to US$109 billion; and to US$133 billion, a further 22% increase, by 2005. The expected extensive growth of online purchases via the Internet will give enormous chances to businesses in general, and Internet Banking (IB) in particular.

Therefore, it is now widely accepted that the information technology revolution will have a profound effect on the conduct of 'how business will be done' as we move towards the new millennium. One of the most important developments, in this respect, has been the explosion of Internet Banking activity on the Internet. With connectivity growing at an average of 10 per cent per month, Internet prove to offer commercial business with more opportunities.

1.1 Internet Banking in Malaysia

It should be noted that electronic banking is a bigger platform than just banking via the Internet. Electronic Banking can also be defined as a variety of platforms such as

Internet Banking (or Online Banking), Telephone Banking, TV-Based Banking, Mobile Phone Banking, and PC Banking (or Offline Banking) whereby customers access these services using an intelligent electronic device, like a personal computer (PC), personal digital assistant (PDA), automated teller machine (ATM), point of sale (POS), kiosk, or Touch Tone telephone.

Ironically, electronic revolution in Malaysian banking has already started since 1970s (Pang, 1995). Nonetheless, the visible form of electronic innovation was also the mere introduction of Automated Teller Machine (ATM). Rapid innovation in the telecommunications and information technology has been the pillar in enabling banks to offer their services through PC banking. Competitiveness in the industry hence has resulted in Malaysian Government to structure a legal framework for bank to provide Internet Banking services. Bank Negara Malaysia (BNM) or Central Bank of Malaysia decided to give the much-awaited approval for domestic banks to leap into the Cyber Wagon on 1st June 2000.

Effectively from June 1st, local domestic banks were allowed to offer full range of products and services over the Internet (BNM, 2000). Malayan Banking Berhad (Maybank) became the first bank to offer Internet Banking services, followed by Hong Leong Bank and the trend then followed by the others. Meanwhile, the locally incorporated foreign owned banks were only allowed to operate Internet Banking after January 1st, 2002. Presently, only bank licensed under the Banking and Financial

Institution Act 1989 (BAFIA) and Islamic Banking Act 1983 are allowed to offer Internet Banking services in Malaysia.

1.2 Why Study Internet Banking

Internet Banking is defined as the provision of banking service through internet so the customer can access the data without any time and geographical limitation. Internet Banking allows customers to perform a wide range of banking transactions via the bank's Web site. The ability to carry out banking transactions through the Internet has empowered customers to execute their financial transactions within the comfort of their homes.

Internet Banking or banking via the Internet can be considered a remarkable development in the banking sector. Besides this, the benefits of Internet Banking is not limited to a particular group of people, as it benefits both bankers and customers alike. The greatest advantage of Internet Banking perhaps lies in the fact that customers are no longer required to wait in those long and wearisome queues of the banks to request a financial transaction or statement. Another important advantage of Internet Banking is that it has made the opening of an account quite simple and easy and without much paperwork. The same flexibility can be observed even while closing an account. You can also apply for bank loans without personally visiting any local branch of your bank. Conventional banking has always been slow and time consuming, so much so that

sometimes you need to wait several hours to process a simple transaction like clearing a check. But, Internet Banking has tremendously reduced the time required to process banking transactions, thereby making banking faster and convenient. For the bankers this system is cost-effective, as it has considerably reduced the administrative costs and paperwork related to the transactions. Besides, banks can also cater to the needs of thousands of customers at the same time. All these factors have significantly increased the profit margins of commercial banks by lowering their operating costs. This has enabled them to offer acceptable interest rates on savings account and credit cards.

With the help Of Internet Banking, you can access any information regarding your account and transactions, any time of the day. This means that you no longer have to depend on the office hours of your bank to obtain information. Therefore, you can regularly monitor your account as well as keep track of financial transactions, which can be of immense help in detecting any fraudulent transaction. In addition to this, fund transfers, both national and international, have also become faster and convenient with Internet Banking. Nowadays, you can transfer funds from one account to another within a few minutes. You can easily carry out stock trading, exchanging bonds and other investments with the help of Internet banking. All these features have made Internet Banking ideal for people who make a number of financial transactions each day.

In addition to availing banking facilities for 24 hours a day, you can also receive other important information regarding banking policies, rates of interest offered on different types of bank accounts and formalities required in executing various transactions. With such information you can compare the services of different banks and opt for the one that satisfies your individual needs and requirements.

1.3 Problem Statement

From reviewing previous studies on the current topic, we can find evidence that although consumers have had an interest in advanced internet banking services and tended to have various financial sources or tools for money transactions, they have not quickly changed their main propensity to use banking services or goods that they are already familiar with (Brown, 2001).

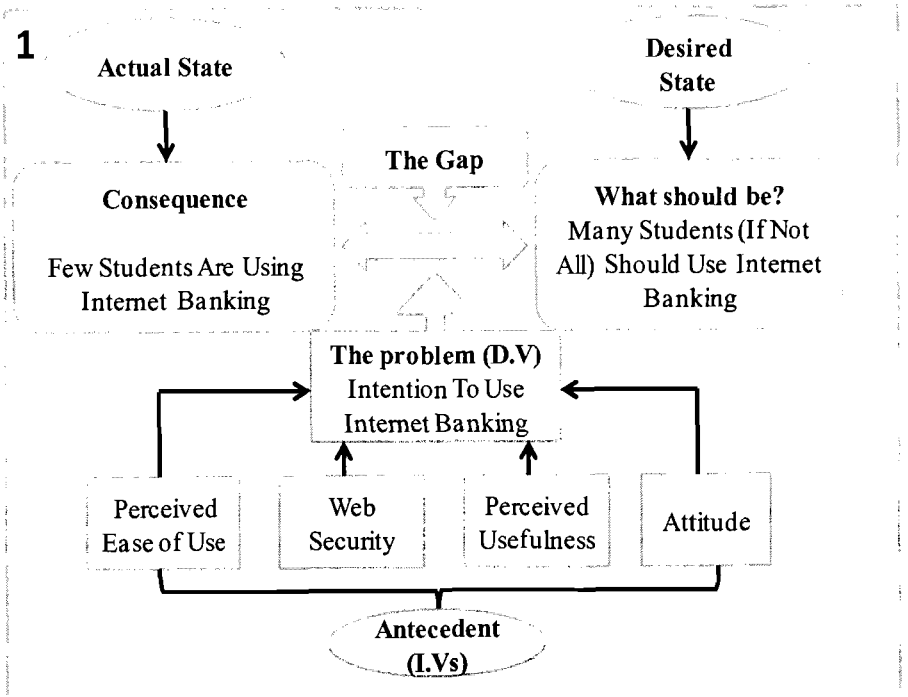
For example, new electronic banking goods or services have not quickly substituted for traditional ones and non-online banking goods or services. Although various electronic banking services have emerged since the ATM was introduced 30 years ago, a lot of consumers still use cheques as a primary source for money transactions, and banks still have a lot of "bricks and mortar" branches in the market. According to the Survey of Consumer Finances in 2001 in the US, about 60% of household heads used cheques as a primary source. Furthermore, the number of bank branches expanded from about 65,000 to about 73,000 from 1994 to 2003, even though the number of U.S banks fell

from about 12,500 in 1994 to about 9,000 during the same period (Hirtle & Metli, 2004). In spite of the emergence of a series of advanced electronic banking services, both consumers and banks still regard non-electronic banking as one of the important sources for money transaction.

This study will focus on the usage of Internet Banking services by students in Universiti Utara Malaysia (UUM) and aims to gain a deeper understanding of the factors influencing the usage of Internet Banking services by students in UUM.

Figure 1.1 explains the problem statement of this study and examine why some students do not use Internet Banking even though they are able to access to it.

Figure 1.1 Problem Statement of the Study



1.4 Research Questions

The study intends to answer the following questions:

1. How does UUM students' attitude influence their intention to use IB?
2. What relationship does the perceived usefulness have with their attitude and intention to use IB?
3. What relationship does the perceived ease of use have with their attitude and intention to use IB?
4. Is perceived web security really a concern to UUM students who are using IB?

1.5 Research Objectives

The main aim of this study is to determine the factors that influence the usage of Internet Banking among students in UUM. The specific objectives are as follow:

1. To investigate how UUM students' attitude influences their intention to use IB;
2. To examine the relationship of perceived usefulness with the their attitude and intention to use IB;
3. To investigate the relationship of perceived ease of use with their attitude and intention to use IB;
4. To investigate whether perceived web security is a concern for the usage of Internet Banking.

1.6 Significance of the Study

The findings will assist banks in understanding the key factors that influence the usage of online banking services. They will also provide information on the needs and preferences of the potential customers. Banks can then make informed decisions, thereby providing better services to their customers. In other words, this research is expected to help banks providing their services especially inside UUM campus such as to improve their Internet Banking services. Moreover the study will contribute in expanding the body of knowledge in the internet and technology usage literature in term of adoption of IB by UUM students in Malaysia. In addition, it will provide academicians and researchers with an update on the usage and acceptance of internet in the banking sector. Besides, this research can contribute to an improved understanding of the factors related to user's acceptance of new technology. In particularly, this study acts as an understanding of the Technology Acceptance Model (TAM). In the particular perspective, this study is significant to provide useful information for bank management in formulating IB marketing strategies.

1.7 Limitations of the Study

Since our research was performed with time limitation, as with other cross-sectional studies, it is not without any constraints. A wider study for more comprehensive investigation of the pre-launch stage, the promotion stage and the post-launch stage of IB would surely be an important contribution to the IB literature in the future. Moreover the sample does not represent all the students of UUM but only across section of the population.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter, we will focus on the studies which were conducted to examine and find what are the main factors that affect people's intention to use information technology which is Internet Banking adoption. In general, there are three major theories that explain in detail what are the main factors which influence one's behavior and attitude to use IT (information technology). In other word, these theories concentrate on what impacts people's intention to use IT. In fact, these theories are somehow interrelated and overlapped because two of them were developed based on the first one which is the theory of reasoned action (TRA). In the next section I will summaries the development process of these theories and I will review some recent studies that are relevant to my research problem.

2.1 Review of Related Theories

If we look further in history of studying human behavior and attitudes, we would find that in 1929, L.L. Thurston developed methods for measuring attitudes using interval scales. Following Thurston's scale came the famous, more specific and easier to use Likert-scale. Allport Gordon W. (1935) theorized that the attitude-behavior relationship was not uni-dimensional as previously thought, but multi-dimensional. Attitudes were

viewed as complex systems made up of the person's beliefs about the object, his feelings toward the object, and his action tendencies with respect to the object. On the same way, Louis Guttman (1944) developed the scalogram analysis to measure beliefs about the object. Moreover, Doob (1947) adopted the idea of Thurstone that attitude is not directly related to behavior but it can tell us something about the overall pattern of behavior. In addition, Rosenberg and Hovland (1960) theorized that a person's attitude toward an object is filtered by their affect, cognition and behavior.

As a result of these developments, Martin Fishbein started to think about the role of attitudes influencing behaviors in the early 1960s and in the early 1970s Ajzen joined him and they collaborated and developed the Theory of Reasoned Action(TRA). It is composed of attitudinal, social influence, and intention variables to predict behavior. It is hypothesized by TRA that the individual's behavioral Intention (BI) to perform a behavior is jointly determined by the individual's Attitude toward performing the Behavior (ATB) and Subjective Norm (SN), which is the overall perception of what relevant others think the individual should or should not do.

As the Theory of Reasoned Action began to take hold in social science, Ajzen realized that this theory was not adequate and had several limitations. One of the greatest limitations was with people who have little or feel they have little power over their behaviors and attitudes. Ajzen described the aspects of behavior and attitudes as being on a continuum from one of little control to one of great control. To balance these observations, Ajzen added a third element to the original theory. This element is the

concept of perceived behavioral control (PBC). The addition of this element has resulted in the newer theory known as the Theory of Planned Behavior in 1985. In fact, TPB expands the boundary conditions of TRA to more goal-directed actions. PBC is a function of control beliefs and perceived facilitation. Control belief is the perception of the presence or absence of requisite resources and opportunities needed to carry out the behavior. Perceived facilitation is one's assessment of the importance of those resources to the achievement of the outcomes (Ajzen and Madden,1986).

In 1989, Davis developed the Technology Acceptance Model (TAM). According to which "users' adoption of computer system" depends on their "behavioral intention to use", which in turn depends on "attitude", consisting of two beliefs, namely Perceived Ease of Use and Perceived Usefulness. The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified. In fact, Davis developed TAM by building upon an earlier theory, the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975). Davis believed that system acceptance will suffer if users do not perceive a system as useful and easy to use. TAM has emerged as a salient and powerful model that can be used to predict potential Information system usage by measuring users' beliefs after they are exposed to the system even for a short period of time through training, prototype or mock-up models (Davis and Venkatesh, 2003).The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology.

The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. The technology acceptance model (TAM), proposed by Davis (1989) is one of the most utilized models in studying information system acceptance (Mathieson, 1991; Gefen et al., 2000; Venkatesh et al., 2000). Davis' results indicated that while ease of use is clearly significant, usefulness is even more important in determining user acceptance.

After that came Innovation Diffusion Theory (IDT) which is a model that explains the process by which innovations in technology are adopted by users. Rogers (1995) defines an innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption". Diffusion is defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system." So, it follows that Innovation Diffusion Theory focuses on explaining how new ideas and concepts gain widespread adoption.

Innovation Diffusion Theory considers a set of attributes associated with technological innovations that affect their rate of widespread adoption. Rogers (1995) defines these attributes as:

Relative advantage – "The degree to which an innovation is perceived to be better than the idea it supersedes."

Compatibility – "The degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters."

Complexity – "The degree to which an innovation is perceived as relatively difficult to understand and use."

Trialability – "The degree to which an innovation may be experimented with on a limited basis."

Observability – "The degree to which the results of an innovation are visible to others."

Rogers reviewed nearly 1500 studies where variants of IDT are used to investigate the adoption of technological innovations in an array of settings including agriculture, healthcare, city planning, and economic development. A smaller set of studies focus on, how these attributes influence behavioral intention and use. Rogers developed his IDT constructs by identifying the product attributes that most greatly influenced adoption.

Similar to TRA, TPB and TAM, Triandis model assumes an attitude-intention-behavior relationship. Triandis model, however, includes a number of relevant variables. The model takes into account the important constructs such as habit, social factors and facilitating conditions. It postulates that the probability of performing an act is a function of (a) habits; (b) intention to perform the act; and (c) facilitating conditions. The intention of performing a particular behavior is a function of the (a) perceived consequences; (b) social factors (including norms, roles and the self-concept); and (c) affect (Chang and Cheung, 2001).

2.2 Review of Previous Studies

In recent studies we can find that Lederer et al. (2000) adapted TAM to study World Wide Web (WWW) usage and found evidence to support TAM. Another study of applying TAM in the WWW context was conducted by Moon and Kim (2001). They introduced the construct playfulness to predict attitude. Data were collected from 152 graduate students of management in Korea. They used TAM as a research model. The data were gathered by means of a questionnaire. Their findings showed that although TAM-related hypotheses were all supported, the results deviated from the basic belief of TAM that "Perceived Usefulness" is the key determinant of user acceptance of IT. The results of Moon and Kim (2001) revealed that "Perceived Ease of Use" has a more significant effect on "Attitude" than "Perceived Usefulness" in the WWW context, and "Perceived Playfulness" (an intrinsic motivational factor) has a more significant effect on "Attitude" than "Perceived Usefulness" (an extrinsic motivational factor).

According to another study done by Salisbury et al. (2001), "Perceived Web Security" was found to favorably influence customers' intention to purchase on the WWW. Customers tend to increase purchases only if they perceive that their credit card and other sensitive information are safe.

In a related study, Cheng et al. (2006) investigated how customers perceived and adopted Internet Banking (IB) in Hong Kong. They developed a theoretical model based on the Technology Acceptance Model (TAM) with an added construct "Perceived Web Security", and empirically tested its ability in predicting customers' behavioral intention

of adopting IB. They designed a questionnaire and used it to survey a randomly selected sample of customers of IB from the Yellow Pages, and obtained 203 usable responses. They analyzed the data using Structural Equation Model (SEM) to evaluate the strength of the hypothesized relationships, if any, among the constructs, which include "Perceived Ease of Use" and "Perceived Web Security" as independent variables, "Perceived Usefulness" and "Attitude" as intervening variables, and "Intention to Use" as the dependent variable. The results provided support of the extended TAM model and confirm its robustness in predicting customers' intention of adoption of IB.

Lallmahamood (2007) explored the impact of perceived security and privacy on the intention to use Internet banking in Malaysia. An extended version of the technology acceptance model (TAM) is used to examine the above perception. A survey was distributed, the 187 responses mainly from the urban cities in Malaysia, have generally agreed that security and privacy are still the main concerns while using Internet banking. The research model explained over half of the variance of the intention to use Internet banking. The unexplained 47 percent of variance suggested that the model may have excluded other possible factors influencing the acceptance of Internet banking. Interaction in the local language (Bahasa Malaysia) did not have an impact on the ease of use of Internet banking.

In a different study conducted by Lee (2009), he explored and integrated the various advantages of online banking to form a positive factor named perceived benefit in Taiwan. In addition, drawing from perceived risk theory, five specific risk facets –

financial, security/privacy, performance, social and time risk – were synthesized with perceived benefit as well as integrated with the technology acceptance model (TAM) and theory of planned behavior (TPB) model to propose a theoretical model to explain customers' intention to use online banking. The results indicated that the intention to use online banking was adversely affected mainly by the security/privacy risk, as well as financial risk and was positively affected mainly by perceived benefit, attitude and perceived usefulness.

In a related study done in University Utara Malaysia, Rafieda (2006) examined the factors that influence lecturers' adoption of internet banking services. Technology Acceptance Model (TAM) was the primary basis for the study. The information gathered from former studies that are mainly concentrating on private customer acted as a foundation for building an extension of TAM suitable for bank's customers. The study sample consisted of 350 lecturers. The analysis reveals that lecturers are not motivated to use internet banking.

In a recent study conducted by Suki (2010) in Malaysia. He examined factors that influence the Internet Banking adoption among Malaysian consumers. The study sample consisted of 100 respondents. The measurement items were adapted from Taylor and Todd (1995); Tan and Teo (2000) utilizing the seven-point Likert scale ranging from 1 – strongly disagree to 7 – strongly agree. Data were analyzed by employing multiple regression analysis. The results showed that Hedonic oriented Internet banking sites, followed by the perceived Importance of Internet Banking to banking needs and

Compatibility all significantly affect the adoption of Internet banking by Malaysian consumers. Trialability had the weakest influence for consumer Internet banking adoption beside Complexity, Risk, and Utilitarian oriented Internet banking sites. The empirical data used for this study was collected in Malaysia market which may have a culturally and technologically different environment from some other countries. The results hint that information about Internet banking services and its benefits is a critical factor influencing the adoption of Internet Banking.

2.3 Summary

In short, this chapter has reviewed relevant studies as well as theories that explain the factors that have an effect on people's attitude, intention to use and behavior and may explain why some people adopt internet banking while others do not. As mentioned above in the previous section, we notice that the issue (problem statement) of this study has continuously received attention and this reflects the importance and significance of the objectives of this study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

In this chapter, we will describe the theoretical framework (research design) which will explain variables that will be included in the study, formulating of hypotheses, data collection and the method used to analyze the data.

3.1 Theoretical Framework

we have chosen TAM as the baseline model for this study because it is a well-tested model concerning users' acceptance of technology. TAM has been used by various researchers to predict users' intention to accept or adopt a variety of technologies and computer systems. Moreover, TAM has become a widely used model for predicting the acceptance and use of information systems, and has recently been applied to predict Internet usage as well. In addition, TAM being a widely used and proven model and also TAM is simple and Internet banking is an information system and an application used by many internet users. Beside that, in a related study, Lederer et al. (2000) adapted TAM to study World Wide Web (WWW) usage and found evidence to support TAM.

According to Wixom and Todd (2005), researchers have sought to extend TAM primarily in one of three ways; by introducing factors from related models, by

introducing additional or alternative belief factors, or by examining antecedents and moderators of perceived usefulness and perceived ease of use. Therefore, we augment TAM with the construct Perceived Web Security. We have included this variable because previous studies such as Salisbury et al. (2001), Godwin (2001) and Aladwani (2001) have found its significant impact on the intention to use internet banking. Some of these studies are as follows:

Salisbury et al. (2001) argue that feeling secure in doing transactions on the Web is often cited by users as a major factor that removes their concerns about the efficient use of the Internet for making online purchases. In addition, Godwin (2001) reported that privacy and security concerns were found to be a major barrier to Internet shopping. This concern has been extended to the Internet banking environment.

Security has been widely recognized as one of the main obstacles to the usage of electronic banking (Aladwani 2001), and privacy issues have proven important barriers to the use of online services (Westin and Maurici 1998). White and Nteli (2004) reported that the level of increase of Internet banking usage for banking purposes has not changed in the UK because of the continuing consumer fear about security.

In a study about the usage of Internet banking, Sathye (1999) reported that privacy and security were found to be significant obstacles to the usage of online banking in Australia. In addition, feeling secure in doing transactions on the Web is often cited by users as a major factor that removes their concerns about the effective use of the Internet for making online purchases.

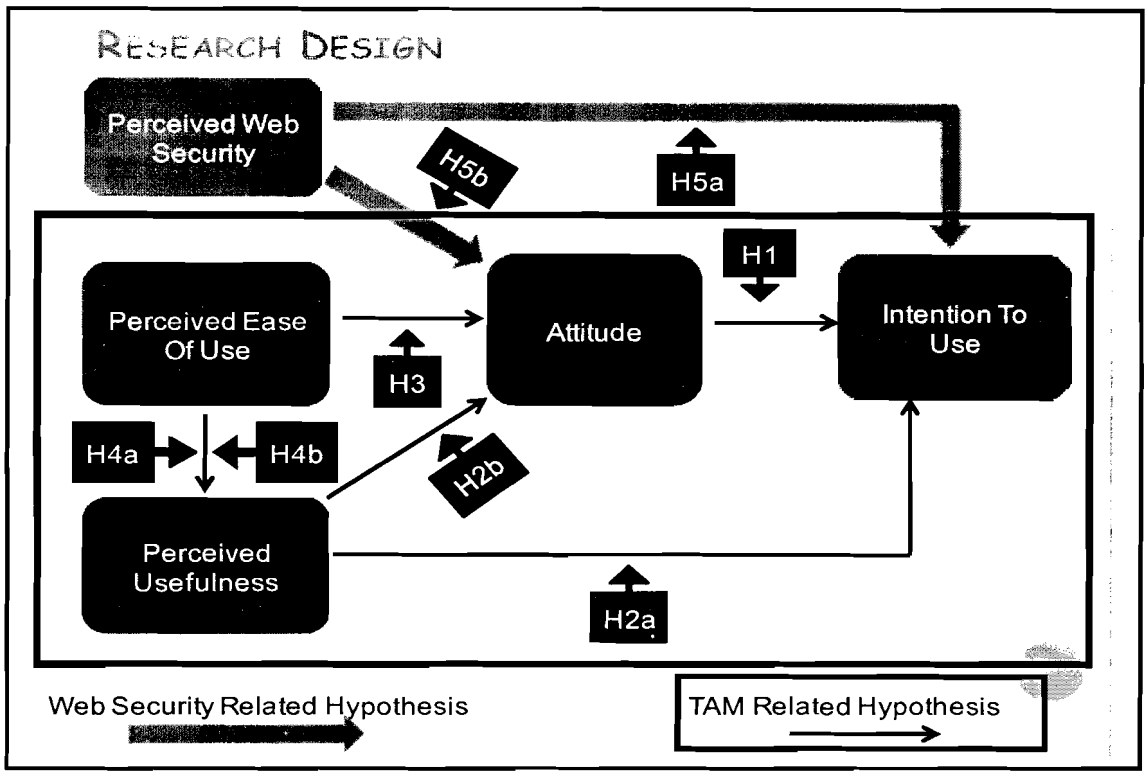
Similar to Salisbury et al. (2001), we include the construct Perceived Web Security as a predictor of Attitude and Intention to Use. However, Salisbury et al. did not include the construct Attitude, which is included in our model. While we adopt the original TAM in this study, we use Behavioral Intention as the dependent variable and skip the construct Actual Usage.

On the theoretical front, an abundance of research studies have reported a strong and significant causal relationship between behavioral intention and usage of technology or targeted behavior (Sheppard et al., 1988; Venkatesh et al., 2000). It is ,therefore, theoretically justifiable to use Behavioral Intention as a dependent variable to examine the acceptance of IB (Mathieson, 1991). Agarwal and Prasad (1999) also argued that for a survey-based research design, Behavioral Intention is more appropriate than Actual Usage as "they are measured contemporaneously with beliefs" and our study is survey-based research. Therefore, the choice of Behavioral Intention, rather than Actual Usage, as the dependent variable is considered both appropriate and necessary.

In summary, we hypothesize that Intention to Use is influenced by Attitude, Perceived Usefulness, Perceived Ease of Use and Perceived Web Security. we will test the strength of the hypothesized relationships embedded in the theoretical model and the robustness of the model in predicting students' intention to adopt IB in Universiti Utara Malaysia Campus.

3.2 Research Design

Figure 3.2 Research model of UUM students' intention to use internet banking



3.3 Hypothesis

Based on the theoretical model developed above, we formulate the research hypotheses as follows. As TAM is used as the base model, we need to test the following TAM hypotheses in the context of IB usage .

H1: Customers' Attitude positively influences their Intention.

H2a: Perceived Usefulness has a direct positive relationship with customers' Intention.

H2b: Perceived Usefulness has a direct positive relationship with customers' Attitude.

H3: Perceived Ease of Use has a direct positive relationship with customers' Attitude.

H4a: Perceived Ease of Use has an indirect positive relationship with customers' Intention via Perceived Usefulness.

H4b: Perceived Ease of Use has an indirect positive relationship with customers' Attitude via Perceived Usefulness.

H5a: Perceived Web Security has a direct positive relationship with customer's Intention.

H5b: Perceived Web Security has a direct positive relationship with customer's Attitude.

3.4 Data Collection Method

The main goal of this study is to determine the factors that influence the intention to use internet banking from customers point of view. The study focuses on contemporary event, and therefore, does not require control over behavioral events. Hence, the most appropriate strategy is survey questionnaires which is a primary source of information.

Since this thesis aims to find out the factors that influence the intention to use internet banking services from customers' point of view, the strategy, which suits for this study, is a survey. Furthermore, the research question of this study is in the form of what, and according to Yin (2009), the relevant research study is a survey.

3.4.1 Sample Selection

The probability sampling method is chosen since we want to generalize result to whole non-user of internet banking population.This study aims to investigate the self-reported behaviors of students' in UUM and their intention to use IB services for their private purposes. Sample will be taken randomly from students with internet experience and at the same time non-user of internet banking or

one-time users (not continual) in UUM. The survey questionnaires were distributed to a sample of 350 randomly selected students.

3.4.2 Survey Questionnaire

The research method for this study is primarily a quantitative approach, and a survey instrument in the form of questionnaire is developed based on previous studies on TAM, and acceptance of Internet banking. According to Sekaran (2006), to ensure the content validity of the scales, the items selected must represent the concept about which generalizations are to be made. Therefore, in devising a useful measurement instrument for this study, we have adapted the instrument and scales developed and validated in the following two studies:

1. The questionnaire developed for TAM by Davis (1989) adapting the scales for Perceived Usefulness and Perceived Ease of Use.
2. The questionnaire developed by Salisbury et al. (2001) adapting the scale for Perceived Web Security.

Both studies have established the validity and reliability of their instrument, particularly the TAM instrument, which has been replicated and widely used in other studies. In this study, we use the adapted question items as the instrument to measure the respective constructs below, using a 7-point Likert scale for each item (with 1=strongly disagree, 2=disagree, 3=slightly disagree, 4=neutral, 5=slightly agree, 6=agree, and 7=strongly agree).

The final questionnaire consists of two sections. The first section consists of 9 items that gathers general information about respondent demographic/ general

questions like age, gender. The second section consists of 19 items relate to user acceptance behavior.

3.5 Measurement of the Factors

In devising a useful measurement instrument for this study, we adapt an instrument and scales developed and validated in previous studies. we will use the TAM instrument, which has been replicated and widely used in other studies. In this study, we use the adapted question items as the instrument to measure the respective constructs below:

1. ***Perceived Ease of Use (PEOU)*** there are four question items used to measure this variable.
2. ***Perceived Usefulness (PU)*** there are four question items used to measure this variable.
3. ***Perceived Web Security (PWS)*** there are four question items used to measure this variable.
4. ***Attitude (ATT)*** there are three question items used to measure this variable
5. ***Intention to Use (IU)*** there are three question items used to measure this variable.

3.6 Data Analysis

The responses regarding intention to use internet banking will be analyzed using SPSS.

Interpretation of a large database such as this, comprising many variables, is often assisted by the use of factor analysis. Factor analysis indentifies groups of variables that are inter-correlated and places them into "factors". Factor analysis can help to identify the dimensions of intention to use internet banking criteria.

Besides factor analysis, correlation analysis, percentage and frequency distribution will also be used to analyze the respondents' profile.

3.6.1 Use of Factor Analysis

Factor analysis, as it is applied in marketing research, refers to a class of statistical techniques whose purpose usually consists of data reduction and summarization (Minhas, 1996; Hooley, 1993; Kim and Mueller,1989). Used in this way, the objective is to reduce a large number of observed variables to a smaller set of underlying factors. By definition, factor analysis is a technique which is used to "reduce a large number of variables to a smaller number by telling us which belong together and which seem to say the same thing" (Emory and Cooper, 1991).

Factor analysis can be conducted on an un-rotated or rotated basis and, if it is to be carried out on rotated basis, various techniques are available. Varimax tend to be preferred as mentioned by Hair et al. (1995), because it seems to give a clearer separation of the factors.

The rationale for using factor analysis according to Kim and Mueller (1989), Harman (1976), and Afifi and Clark (1984) include:

- To identify underlying constructs or factors that explain the correlation among a set of variables.
- To test hypotheses about the structure of variables.
- To summarize a large number of variables with a smaller number of derived variables.
- To determine the number of dimensions required representing a set of variables.

3.7 Pilot Study and Reliability Test

A pilot study will be conducted before distributing all questionnaires. In the pilot study, the measurement of variables, the scales, the validity and lastly the reliability are tested. Basically, a pilot study is conducted to determine the consistency and reliability of the questionnaire. Consistency explains how the elements measuring a concept hold together as a set of instruments. This is shown through statistical results. Reliability of measures is assessed with the use of Cronbach's alpha (Churchill, 1979; Peter, 1979). Cronbach's alpha allows us to measure the reliability of different factors.

This is supported by Sekaran (2006), who stated that Cronbach's alpha is a reliability coefficient that reflects how well the items in a set are positively correlated to one another. Cronbach's alpha is computed in terms of the average intercorrelations among the items measuring the concept. Again, according to Sekaran (2006), any reliability coefficient is in the range of 0.7 is acceptable and if 0.8 and above are considered good. In other word, the closer Cronbach's alpha is to 1 the higher is the internal consistency reliability.

Per-testing of the questionnaire will be done among convenience sampling of a smaller number of students in UUM to make sure that prospective respondents understand the content in the way intended by the researcher. Moreover, it is mainly to examine and modify the questionnaire with regard to its layout, comprehensibility and influence on individuals. Over a period of one week, 25 valid surveys are completed, with additional comments duly noted for improvement of the questionnaire design. All 25 questionnaires are analyzed. The SPSS program is used to determine the reliability (Cronbach's alpha) of the independent and dependent variables. The results show that Cronbach's alpha are 0.923, 0.875, 0.745, 0.934, 0.837 and 0.749 for Perceived Ease of Use (PEU), Perceived Usefulness (PU), Perceived Web Security (PWS), Attitude (ATT), and Intention to Use (IU) respectively, which means that all variables (independents and dependent) are positively correlated to one another because these values are close to 1. Therefore, the reliability coefficient of pilot study is considered good and thus further distribution of questionnaires should have been done in order to gain the information needed.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.0 Introduction

This chapter explains the findings of the study conducted in accordance with the objectives mentioned in Chapter One. The data are analyzed using SPSS programs and the results obtained are presented in the following sections. The first section describes the analysis of frequency of demographic profile and internet using habits of the respondents. The second section explains the reliability analysis test. The third section shows the descriptive analysis of the study variables. Fourth section explains correlation analysis (strength of the relationships are also reported) and hypothesis testing based on hypotheses developed in Chapter Three. The last section describes the results of factor analysis.

A total of 350 questionnaires were distributed to respondents in the library building of Universiti Utara Malaysia. The survey period consisted of 2 weeks from March 10 to March 24, 2011. 286 questionnaires were collected back. The analysis was based on these usable responses received. Therefore, the number of questionnaires included in the analysis was 286.

4.1 Demographic Profile of Respondents

This section provides a discussion concerning demographic characteristics or respondents' profile as it is shown in the following Tables.

4.1.1 Gender

Table 4.1.1: Respondent Profile by Gender

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Male	198	69.2	69.2	69.2
Female	88	30.8	30.8	100.0
Total	286	100.0	100.0	

Table 4.1.1 shows that 198 of the respondents are male or 69.2% percent, while the female respondents account for 30.8% percent, or 88 respondents from a total of 286 respondents .

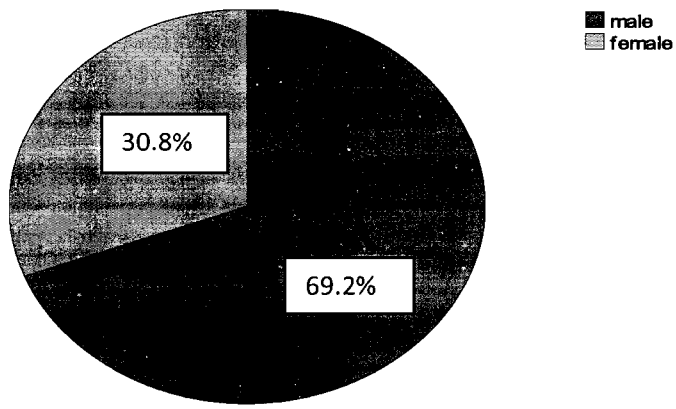


Figure 4.1.1 Respondent Profile by Gender

4.1.2 Age

Table 4.1.2: Respondent Profiles by Age

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Less Than 20 Years Old	61	21.3	21.3	21.3
21-25 Years Old	52	18.2	18.2	39.5
26-30 Years Old	131	45.8	45.8	85.3
31-40 Years Old	23	8.0	8.0	93.4
More Than 40 Years Old	19	6.6	6.6	100.0
Total	286	100.0	100.0	

Table 4.1.2 shows that the majority of the respondents are in the category of 26-30 years old (45.8%) followed by the age category of less than 20 years (21.3%). This is followed by those aged between 21-25 years old (18.2%), and lastly respondents aged above 30 years account for (14.6%) percent.

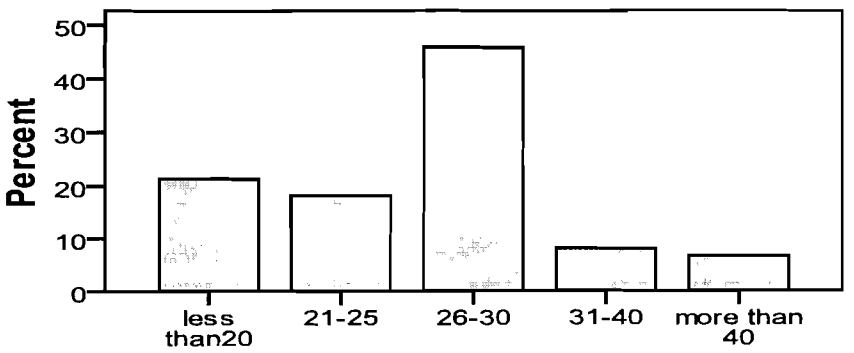


Figure 4.1.2 Respondent Profiles by Age

4.2 Internet Usage Habit

4.2.1 Access to the Internet

Table 4.2.1: Respondent Profiles by Access to the Internet

Category	Frequency	Percent	Valid Percent	Cumulative Percent
At Home	234	81.8	81.8	81.8
At University	52	18.2	18.2	100.0
Total	286	100.0	100.0	

Table 4.2.1, it is clear that most of the respondents have access to internet at home with a percentage of 81.8 or 234 respondents. The rest of respondents have access to internet at university.

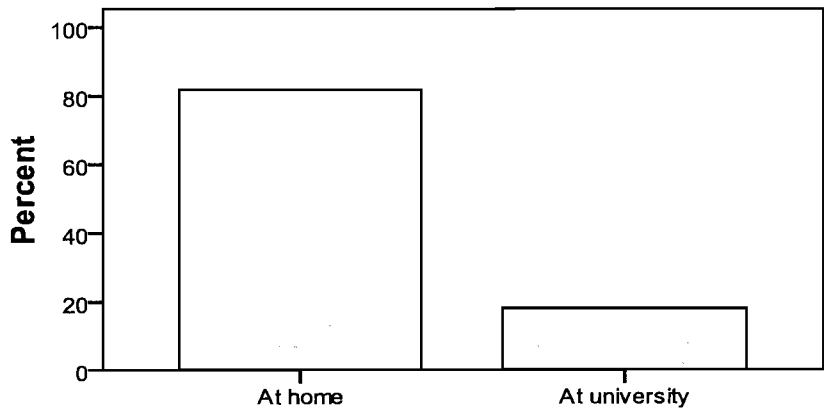


Figure 4.2.1 Respondent Profiles by Access to the Internet

4.2.2 Months of Using Internet

Table 4.2.2: Respondent Profiles by Months of Using Internet

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Less Than 3 Months	8	2.8	2.8	2.8
3-6 Months	31	10.8	10.8	13.6
6-12 Months	98	34.3	34.3	47.9
More Than 12 Months	149	52.1	52.1	100.0
Total	286	100.0	100.0	

Table 4.2.2 shows that the majority of respondents have been using internet for more than one year (52.1% or 149 respondents). While 34.3% or 98 of them have been using internet from 6-12 months. Only 13.6% have been using internet for less than 6 months.

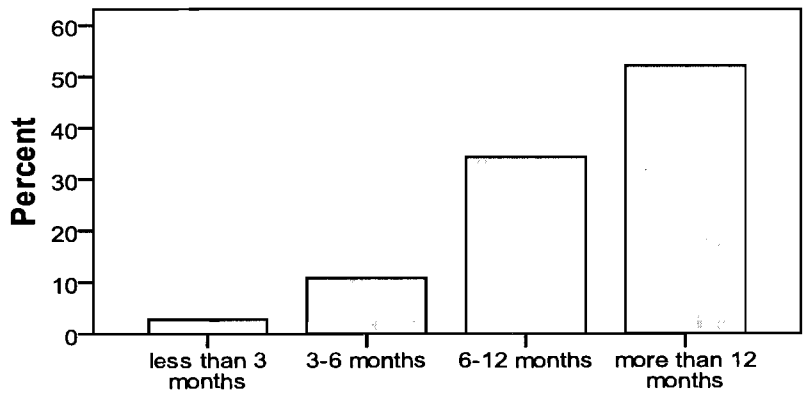


Figure 4.2.2: Respondent Profiles by Months of Using Internet

4.2.3 I Use Internet Banking Frequently

Table 4.2.3: Respondent by Frequency of Using Internet Banking

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	14	4.9	4.9	4.9
Disagree	22	7.7	7.7	12.6
Somewhat Disagree	16	5.6	5.6	18.2
Neutral	55	19.2	19.2	37.4
Somewhat Agree	126	44.1	44.1	81.5
Agree	25	8.7	8.7	90.2
Strongly Agree	28	9.8	9.8	100.0
Total	286	100.0	100.0	

Table 4.2.3 clearly demonstrates that most respondents use internet banking frequently as 62.6% or 179 said that they agree. 19.2% or 55 respondents said "neutral", while 18.2% or 52 said that they do not use internet banking frequently.

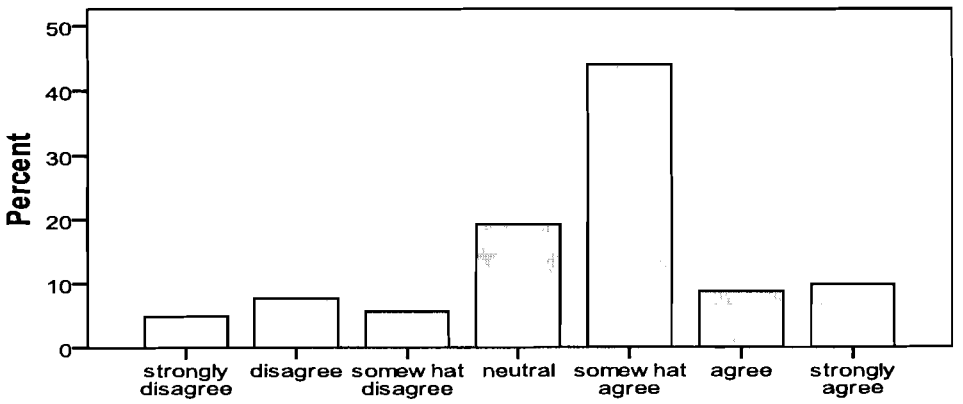


Figure 4.2.3: Respondent by Frequency of Using Internet Banking

4.2.4 I Encounter Problem Frequently In Using Internet banking

Table 4.2.4: Respondent by Encountering Problem

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	40	14.0	14.0	14.0
Somewhat Disagree	103	36.0	36.0	50.0
Neutral	17	5.9	5.9	55.9
Somewhat Agree	65	22.7	22.7	78.7
Agree	50	17.5	17.5	96.2
Strongly Agree	11	3.8	3.8	100.0
Total	286	100.0	100.0	

As it is clear from Table 4.2.4 that many respondents do not encounter problem frequently in using Internet Banking as 50% or 143 disagree on the statement above, While 44% or 126 said that they encounter problem frequently in using IB.

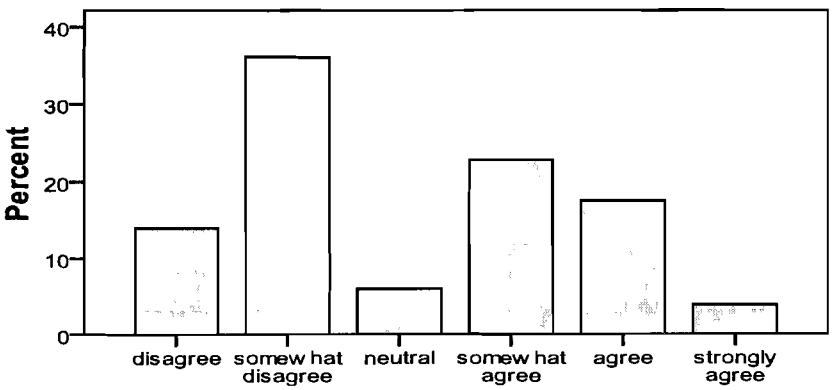


Figure 4.2.4: Respondent by Encountering Problem

4.2.5 I Use Internet Banking Service Frequently as Source of Information

Table 4.2.5: Respondent by Considering Internet Banking as Source of Information

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	9	3.1	3.1	3.1
Somewhat Disagree	12	4.2	4.2	7.3
Neutral	26	9.1	9.1	16.4
Somewhat Agree	122	42.7	42.7	59.1
Agree	91	31.8	31.8	90.9
Strongly Agree	26	9.1	9.1	100.0
Total	286	100.0	100.0	

From Table 4.2.5, we conclude that 83.6% or 239 of the respondents said that they use Internet Banking service frequently as source of information. While only 7.3% or 21 of them stated that they do not use Internet Banking service frequently as source of information.

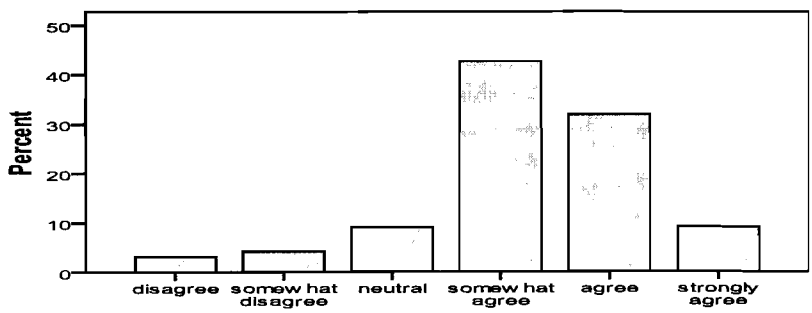


Figure 4.2.5: Respondent by Considering Internet Banking as Source of Information

4.2.6 I Use internet banking From More than One Bank Frequently

Table 4.2.6: Respondent by Number of Banks Used

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	19	6.6	6.6	6.6
Somewhat Disagree	9	3.1	3.1	9.8
Neutral	51	17.8	17.8	27.6
Somewhat Agree	85	29.7	29.7	57.3
Agree	87	30.4	30.4	87.8
Strongly Agree	35	12.2	12.2	100.0
Total	286	100.0	100.0	

It is obvious from Table 4.2.6 that most of the respondents do use Internet Banking from more than one bank frequently as 72.3 % or 207 stated that they agree on the statement above. While 9.7% or 28 said that they do not use internet banking from more than one bank frequently.

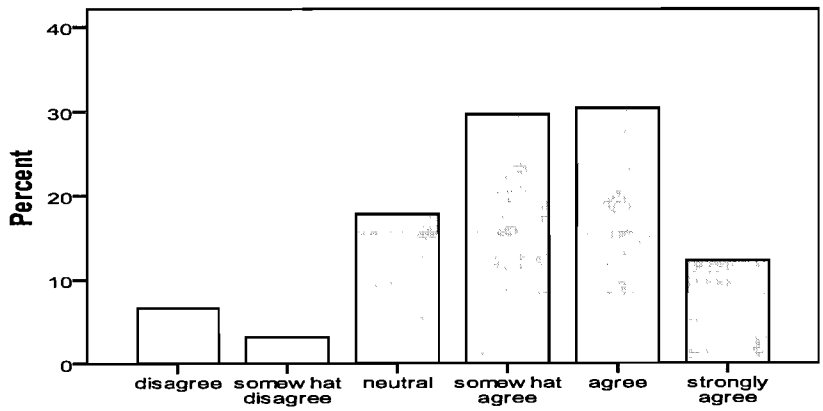


Figure 4.2.6: Respondent by Number of Banks Used

4.2.7 Besides IB, I Use Frequently Other Banking Channels (ATM, Branch Teller, Phone Banking)

Table 4.2.7: Respondent by Banking Channels Used

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	15	5.2	5.2	5.2
Somewhat Disagree	14	4.9	4.9	10.1
Neutral	41	14.3	14.3	24.5
Somewhat Agree	107	37.4	37.4	61.9
Agree	94	32.9	32.9	94.8
Strongly Agree	15	5.2	5.2	100.0
Total	286	100.0	100.0	

From Table 4.2.7, we can see that 75.5% or 216 of respondents stated that they use frequently other banking channels (ATM, branch teller, phone banking). While 10.1% or 29 Disagreed with the statement above.

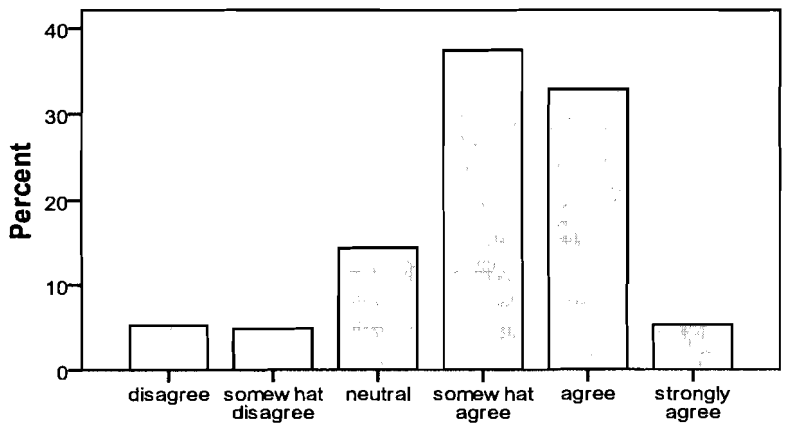


Figure 4.2.7: Respondent by Banking Channels Used

4.3 Reliability Analysis Test

Reliability is the extent to which an experiment, test or any measuring procedure would yield the same result on repeated trials. Zikmund (2000) has coined a simple definition for reliability and stated it as the degree to which measures are free from errors and thus yield consistent results.

Table 4.3: Results of Reliability Test

Variables	No. of Items	Cronbach's Alpha
Perceived Ease of Use	**4**	**.936**
Perceived Usefulness	**4**	**.912**
Perceived Web Security	**4**	**.916**
Attitude	**4**	**.881**
Intention to Use	**3**	**.864**

All the measures obtained from the 286 respondents (N=286) were subjected to reliability analysis to assess the dimensionality of the measurement scale. Scale reliability was assessed in term of items-to-total correlation and Cronbach's alpha to determine the internal consistency of the measurement scale.

Table 4.3 shows the variables and the Cronbach's alpha calculated. The Cronbach's alpha for the variables for Perceived Ease of Use, Perceived Usefulness, Perceived Web Security, Attitude and Intention to Use are: **.936, .912 .916, .881** and **.864** respectively.

From these results, it can be concluded that the measures are all internally consistent and reliable as all of them have a Cronbach's alpha greater than 0.7.

4.4 Descriptive Statistics

When performing the multivariate data analysis, creating a table of means and standard deviations must be considered as the initial step in the process (Genser et al., 2007). It is so because these scores may have a significant influence on the results of analysis and can thus be a cause for concern. Table 4.3 shows the means and standard deviations computed .

Table 4.4: Descriptive Statistics

Item	N	Minimum	Maximum	Mean	Std. Deviation
PEU	286	1.00	7.00	4.3942	1.21538
PU	286	1.00	6.50	4.4834	1.07113
PWS	286	1.00	7.00	4.4738	1.13428
ATT	286	1.00	6.25	4.3960	1.16430
IU	286	1.00	7.00	4.3800	1.25383
Valid N (listwise)	286				

Based on the information given in Table 4.11 the mean and standard deviations of the variables can be interpreted as follows: The mean value of all variables is approximately close to 4.50 which indicates that the all variables account for high mean as the minimum value was 1while the maximum was 7.00.

4.5 Pearson Correlation Analysis

One of the bi-variate measures of association that can be used for the purposes of measuring a relationship between two variables is correlation (Zikmund, 2000). When using correlation, one has to be aware of certain shortcomings present when applying it in practice. One of these shortcomings lies in the fact that correlation operates in a symmetrical fashion, and thus does not provide the researcher with any evidence about the cause-effect directional flow. When working with a set of variables where the dependent variable can be affected by a number of other variables, one must be aware of the fact that any covariance these attributes share with the given independent variable in a correlation may be falsely attributed to that independent variable. Another thing to remember is that correlation usually understates the relationship between two variables which are correlated in a non-linear relationship. Measurement errors attenuate correlation to the extent of the error caused in measurements including the use of sub interval data or artificial truncation of the range of the data.

Pearson has come up with a correlation matrix which is capable of indicating the direction, strength and significance of the bi-variate relationship between the variables studied.

The scale model suggested by Zikmund (2000) has been used in this study to describe the relationship between the independent variables and the dependent variables, the association measurements are described as: 0.7 and above – very strong relationship, 0.50 to 0.69 – strong relationship, 0.30 to 0.49 – moderate relationship, 0.10 to 0.29 – weak relationships, and 0.00 to 0.09 – very weak relationship.

Table 4.5 Pearson Correlation Analysis

		PEU	PU	PWS	ATT	IU
PEU	Pearson Correlation	1	**.899****	.669**	**.856****	**.944****
	Sig. (2-tailed)		.000	.000	.000	.000
	N	286	286	286	286	286
PU	Pearson Correlation		1	.868**	**.897****	**.891****
	Sig. (2-tailed)			.000	.000	.000
	N		286	286	286	286
PWS	Pearson Correlation			1	**.857****	**.677****
	Sig. (2-tailed)				.000	.000
	N			286	286	286
ATT	Pearson Correlation				1	**.918****
	Sig. (2-tailed)					.000
	N				286	286
IU	Pearson Correlation					1
	Sig. (2-tailed)					
	N					286

From Table 4.5, it can be seen that the variables selected, namely the Internet Perceived Ease of Use, Perceived Usefulness, Perceived Web Security and Attitude have all been significantly correlated to the Intention to Use; correlated positively. According to (Zikmund,2000), the Pearson Correlation Coefficients of **0.944, 0.891, 0.677** and **0.918** represent the relationship among variables.

4.6 Hypotheses Testing : Results of One-Way ANOVA

Hypothesis testing is a method of making decisions using experimental data. Hypothesis testing is also known as confirmatory data analysis as it is conducted to confirm a hypothesis already formed against exploratory data analysis where data is analyzed to form a hypothesis. Statistical hypothesis testing is a widely used technique for inferring relationship between variables. Contrary to statistical hypothesis testing, Bayesian approach to hypothesis testing is based on the posterior probability to reject the hypothesis. Decision theory and optimal decisions are other methods which can be used to arrive at decisions based on data.

4.6.1 Hypothesis 1

H1: Customers' Attitude positively influences their Intention to use IB.

Table 4.6.1 Findings of One-Way ANOVA on Intention and its Relationship With Attitude

AAT ⟶ IU	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	386.891	20	19.345	0.81	.000
Within Groups	61.154	265	.231		
Total	448.045	285			

Table 4.6.1 shows that probability (P) is zero which is less than 0.01. In other word, this hypothesis is accepted at significance level of 0.01.

4.6.2 Hypothesis 2

H2a: Perceived Usefulness has a direct positive relationship with customers' Intention.

Table 4.6.2 Findings of One-Way ANOVA on Intention and its Relationship With Perceived Usefulness

PU ⟶ IU	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	374.208	21	17.819	1.30	.000
Within Groups	73.837	264	.280		
Total	448.045	285			

Table 4.6.2 shows that probability (*P*) is zero which is less than 0.01. Therefore , this hypothesis is accepted at significance level of 0.01.

4.6.3 Hypothesis 3

H2b: Perceived Usefulness has a direct positive relationship with customers' Attitude.

Table 4.6.3 Findings of One-Way ANOVA on Attitude and its Relationship With Perceived Usefulness

PU ⟶ ATT	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	322.975	21	15.380	0.76	.000
Within Groups	63.368	264	.240		
Total	386.343	285			

Table 4.6.3 shows that probability (*P*) is zero which is less than 0.01. Hence, this hypothesis is accepted at significance level of 0.01.

4.6.4 Hypothesis 4

H3: Perceived Ease of Use has a direct positive relationship with customers' Attitude.

Table 4.6.4 Findings of One-Way ANOVA on Attitude and its Relationship With Perceived Ease of Use

PEU ⟶ ATT	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	310.582	23	13.504	2.40	.000
Within Groups	75.761	262	.289		
Total	386.343	285			

Table 4.6.1 shows that probability (*P*) is zero which is less than 0.01. Thus, this hypothesis is accepted at significance level of 0.01.

4.6.5 Hypothesis 5

H4a: Perceived Ease of Use has an indirect positive relationship with customers' Intention via Perceived Usefulness.

Table 4.6.5 Findings of One-Way ANOVA on Intention and its Relationship With Perceived Ease of Use via Perceived Usefulness

PEU⟶ PU⟶ IU	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	408.561	23	17.764	2.07	.000
Within Groups	39.484	262	.151		
Total	448.045	285			

Table 4.6.5 shows that probability (*P*) is zero which is less than 0.01 which makes this hypothesis is accepted at significance level of 0.01.

4.6.6 Hypothesis 6

H4b: Perceived Ease of Use has an indirect positive relationship with customers' Attitude via Perceived Usefulness.

Table 4.6.6 Findings of One-Way ANOVA on Attitude and its Relationship With Perceived Ease of Use via Perceived Usefulness

PEU→PU→ATT	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	276.540	23	12.023	0.52	.000
Within Groups	50.444	262	.193		
Total	326.984	285			

Table 4.6.6 shows that probability (*P*) is zero which is less than 0.01. Subsequently, this hypothesis is accepted at significance level of 0.01.

4.6.7 Hypothesis 7

H5a: Perceived Web Security has a direct positive relationship with customer's Intention.

Table 4.6.7 Findings of One-Way ANOVA on Intention and its Relationship With Perceived Web Security

PWS → IU	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	250.094	21	11.909	3.10	.000
Within Groups	197.951	264	.750		
Total	448.045	285			

Table 4.6.7 shows that probability (*P*) is zero which is less than 0.01. In other word, this hypothesis is accepted at significance level of 0.01.

4.6.8 Hypothesis 8

H5b: Perceived Web Security has a direct positive relationship with customer's Attitude.

Table 4.6.8 Findings of One-Way ANOVA on Attitude and its Relationship With Perceived Web Security

PWS→ ATT	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	304.912	21	14.520	2.66	.000
Within Groups	81.431	264	.308		
Total	386.343	285			

Table 4.6.8 shows that probability (*P*) is zero which is less than 0.01. As a result, this hypothesis is accepted at significance level of 0.01.

Table 4.6.9 summarizes the findings of hypotheses testing at 0.01 level of significance.

TABLE 4.6.9 Summery of Hypotheses Testing

Number	Hypothesis	Conclusion	Sig.<0.01= accept Sig.>0.01= reject
H1	Customers' Attitude positively influences their Intention	**Accept**	**0.000**
H2a	Perceived Usefulness has a direct positive relationship with customers' intention	**Accept**	**0.000**
H2b	Perceived Usefulness has a direct positive relationship with customers' Attitude	**Accept**	**0.000**
H3	Perceived Use of use has a direct positive relationship with customers' Attitude	**Accept**	**0.000**
H4a	Perceived Use of use has a indirect positive relationship with customers' intention via perceived usefulness	**Accept**	**0.000**
H4b	Perceived Use of use has a indirect positive relationship with customers' Attitude via perceived usefulness	**Accept**	**0.000**
H5a	Perceived Web Security of use has a direct positive relationship with customers' intention	**Accept**	**0.000**
H5b	Perceived Web Security of use has a direct positive relationship with customers' Attitude	**Accept**	**0.000**

4.7 Factor Analysis

Using SPSS, we have conducted our exploratory factor analysis on our survey data. Table 4.7.1 presents the rotated factor matrix which is a result from independent variables' Varimax rotated principal axis factor extraction. The 1.0 eigenvalue cut-off criterion has been used for the independent variables factor extraction. The table points out that five factors which are the variables used for our research have emerged and reports their factor loadings.

In general, factor analysis that account for 60 to 70 % or more of the total variance is considered a good fit to the data (Kim and Mueller, 1989). In addition, all characteristics with factor loadings of 0.50 and above were retained (Almossawi, 2001). The resulting varimax rotation factors are shown in the following tables.

Table 4.7.1 Reliability and Factor Analysis (From SPSS Analysis)

Item	Reliability	Factor loading	Cronbach alpha	Variance explained (%)
Perceived Ease of Use (PEU)			0.957	87.954
Using the Internet Banking (IB) service is easy for me	0.975	0.747		
I find my interaction with the IB services clear and understandable	0.974	0.841		
It is easy for me to become skillful in the use of the IB services	0.974	0.940		
Overall, I find the use of the IB services easy	0.973	0.942		

Perceived Usefulness (PU)			0.948	8.457
Using the IB would enable me to accomplish my tasks more quickly	0.974	0.940		
Using the IB would make it easier for me to carry out my tasks	0.973	0.942		
I would find the IB useful	0.975	0.958		
Overall, I would find using the IB to be advantageous	0.976	0.896		
Perceived Web Security (PWS)			0.972	2.484
I would feel secure sending sensitive information across the IB	0.975	0.925		
The IB is a secure means through which to send sensitive information	0.975	0.911		
I would feel totally safe providing sensitive information about myself over the IB	0.975	0.931		
Overall, the IB is a safe place to transmit sensitive information	0.975	0.925		
Attitude (ATT)			0.948	0.858
Using the IB is a good idea	0.975	0.931		
I would feel that using the IB is pleasant	0.975	0.936		
In my opinion, it would be desirable to use the IB	0.974	0.940		

In my view, using the IB is a wise idea	0.973	0.942		
Intention to Use (IU)			0.953	0.247
I would use the IB for my banking needs	0.973	0.942		
Using the IB for handling my banking transactions is something I would do	0.974	0.940		
I would see myself using the IB for handling my banking transactions	0.973	0.942		

Used SPSS Principal Axis Factoring extraction with Varimax rotation method

As it is shown in Table 4.7.1, all factor loadings are larger than 0.5 for all items of the five variables included in this study, which characterize an acceptable significant level of internal validity.

The factor loadings vary from 0.747 to 0.942 for Perceived Ease of Use (PEU) which proves that all items used should be retained, which means that they are suitable and convenient for this study.

For items included in Perceived Usefulness (PU) the factor loadings vary from 0.896 to 0.958 which also leads to a good indication regarding these items.

In terms of Perceived Web Security (PWS) the factor loadings vary from 0.911 to 0.931 which also support the idea of retaining all items.

For Attitude (ATT), it varies from 0.931 to 0.942 which also leads to a good indication regarding these items.

Finally, the range of factor loadings is from 0.940 to 0.942 for Intention to Use (IU) which also support the idea of retaining all items.

All 19 questionnaire items are held on to further analysis, because all factor loadings are found to be of an acceptable significant level.

For evaluation of the Cronbach's alpha we have tested the data using the SPSS Exploratory Factor Analysis (EFA), where the Cronbach's alpha ranged from 0.948to 0.972. To ensure convergent validity and item reliability we have evaluated each of the items individually.

Table 4.7.2 Detailed Factor Analysis

Attributes	Factor 1	Factor 2	Factor 3
Perceived Ease of Use			
Using the Internet Banking service is easy for me	**0.709**	0.028	0.493
I find my interaction with the use of the Internet Banking services clear and understandable	**0.820**	0.131	0.390
It is easy for me to become skillful at the use of the Internet Banking services	**0.913**	0.215	0.243
Overall, I find the use of the Internet Banking services easy	**0.825**	0.480	0.177
Perceived Usefulness			
Using the Internet Banking would enable me to accomplish my tasks more quickly	**0.913**	0.215	0.243
Using the Internet Banking would make it easier for me to carry out my tasks	**0.825**	0.479	0.177
I would find the Internet Banking useful	0.304	0.351	**0.861**
Overall, I would find using the Internet Banking to be advantageous	0.247	0.271	**0.873**
Perceived Web Security			
I would feel secure sending sensitive information across the Internet Banking	0.240	0.302	**0.881**
The Internet Banking is a secure means through which to send sensitive information	0.247	0.344	**0.855**
I would feel totally safe providing sensitive information about myself over the Internet Banking	0.306	**0.839**	0.364
Overall, the Internet Banking is a safe place to transmit sensitive information	0.307	**0.841**	0.352
Attitude			
Using Internet Banking is a good idea	0.326	**0.844**	0.336
I would feel that using Internet Banking is pleasant	0.306	**0.855**	0.333
In my opinion, it would be desirable to use Internet Banking	**0.913**	0.215	0.243
In my view, using Internet Banking is a wise idea	**0.825**	0.480	0.177
Intention to Use			

I would use the Internet Banking for my banking needs	**0.825**	0.479	0.177
Using the Internet Banking for handling my banking transactions is something I would do	**0.913**	0.215	0.243
I would see myself using the Internet Banking for Handling my banking transactions	0.825	0.480	0.177
Eigenvalues	13.622	2.420	1.426
Percentage of Variance	71.696	12.737	7.508
Cumulative Variance	71.696	84.433	91.941

As it is shown in Table 4.7.2, the first factor identifies four major dimensions. In other word, it has a cluster of relationships among four variables (Perceived Ease of Use, Perceived Usefulness, Attitude and Intention to Use). Regarding the first dimension which is Perceived Ease of Use (PEU), it includes Using the Internet Banking service is easy for me (0.709), I find my interaction with the use of the Internet Banking services clear and understandable (0.820), it is easy for me to become skillful at the use of the Internet Banking services (0.913) and Overall, I find the use of the Internet Banking services easy (0.825).

Regarding the second dimension which is Perceived Usefulness (PU), it includes Using the Internet Banking would enable me to accomplish my tasks more quickly (0.913) and Using the Internet Banking would make it easier for me to carry out my tasks (0.825).

Third dimension would be Attitude which includes in my opinion, it would be desirable to use Internet Banking (0.913) and in my view, using Internet Banking is a wise idea (0.825).

The last dimension regarding first factor is Intention to Use. It includes I would use the Internet Banking for my banking needs (0.825) and Using the Internet Banking for handling my banking transactions is something I would do (0.913).

This factor accounts for (71.696) of total variance and considered the most important factor in determining how easy bank clients can use internet banking which is Perceived Ease of Use, as all items in this variable got values greater than 0.5. Thus, this factor could be labeled "Perceived Ease of Use".

The second factor as it is shown in Table 4.7.2, delineates two dimensions. These are Perceived Web Security and Attitude. Concerning Perceived Web Security, it includes I would feel totally safe providing sensitive information about myself over the Internet Banking (0.839) and Overall, the Internet Banking is a safe place to transmit sensitive information (0.841).

In relation to Attitude, it includes Using Internet Banking is a good idea (0.844) and I would feel that using Internet Banking is pleasant (0.855). This factor accounts for (12.737) of total variance. Therefore, this factor could be labeled as either Perceived Web Security or Attitude as two items of each of them accounts for greater than 0.5.

The last factor which is number three delineates two dimensions. Theses dimensions consist of Perceived Usefulness and Perceived Web Security. Regarding Perceived Usefulness, it includes I would find the Internet Banking useful (0.861) and Overall, I would find using the Internet Banking to be advantageous (0.873).

Concerning Perceived Web Security, it has I would feel secure sending sensitive information across the Internet Banking which account for (0.881) and The Internet

Banking is a secure means through which to send sensitive information (0.855). This factor accounts for (7.508) of the total variance. Therefore, this factor could be labeled as either Perceived Usefulness or Perceived Web Security as two items of each of them accounts for greater than 0.5.

4.9 Conclusion

This chapter explains the finding of the study conducted in accordance with the objectives mentioned in Chapter One. Hypotheses developed in Chapter Three are tested and accepted, strength of the relationships are also reported and proven. Several statistical methods are used to analyze the data. This chapter presents the results of the data analysis carried out to determine the relationship between the independent variables and the dependant variable. From the 350 questionnaires distributed, 296 responses are received and out of these 286 responses are found to be complete. These 286 responses are used in the analysis. Initially, the demographic factors of the respondents are analyzed and presented in a table and in graphical format. Then the reliability of the data received is tested using Cronbach's Alpha and is found to be one-dimensional, internally consistent, reliable and valid for analysis of the model.

The relationship between the independent variables and dependant variable has been tested using correlation analysis. The results of the Pearson's correlation analysis showed a positive correlation between the independent variables and the dependant variable confirming the hypotheses developed in Chapter Three. Thus it was concluded that there are strong positive relationship between the Internet Usage Habit, Perceived Ease of Use, Perceived Usefulness, Perceived Web Security, Attitude and Intention to Use.

Factor analysis has been conducted and shows that all items in the questionnaire are found to have high factor loadings which are greater than 0.5. This indicates a high level of consistency among all variables included in this study.

CHAPTER FIVE

SUMMARY AND CONCLUSIONS

5.0 Introduction

This chapter summarizes the findings of the study and provides recommendations for banks and also for related future studies. Moreover, practical implications will be presented in this Chapter.

5.1 Summary

It is found from this study that the relationship between the independent variables and dependant variable has been tested using correlation analysis. The results of the Pearson's correlation analysis showed a positive correlation between the independent variables and the dependant variable confirming the hypotheses developed in Chapter Three. Thus it was concluded that there are strong positive relationship between the Internet Usage Habit, Perceived Ease of Use, Perceived Usefulness, Perceived Web Security, Attitude and Intention to Use.

The purpose of this research is to propose an extension of Perceived Web Security with TAM model in a more comprehensive manner that jointly predicts user adoption of internet banking. This study has extended the TAM by considering the characteristics of the Internet banking environment. This study has verified that an additional belief, of Perceived Web Security, is one of the most important

determinants of customer adoption of Internet banking. A sample of 286 of UUM students who use internet banking has been conducted to empirically examine this research model. There are several new findings regarding the roles of Perceived Web Security with TAM in internet banking as discussed previously.

5.2 Conclusions

The objectives of the study are as follows:

1. To investigate how UUM students' Attitude influence their Intention to use IB;

2. To examine the relationship of Perceived Usefulness with the UUM students' Attitude and Intention to use IB;

3. To investigate the relationship of Perceived Ease of Use with the UUM students' Attitude and Intention to use IB;

4. To investigate whether Perceived Web Security is a concern for the usage of internet banking.

In relation to the first objective, it is clear from correlation analysis done in the previous chapter that there is a positive significant relationship between students' attitude and their intention to adopt internet banking which account for 0.918.

Regarding the second objective, it was also shown in the previous chapter that there is a positive significant relationship between Perceived Usefulness and intention to adopt internet banking via attitude which account for 0. 897.

Concerning the third objective, it is proven that there is a positive significant relationship between Perceived Ease of Use and intention to adopt Internet Banking via Attitude which accounts for 0. 856.

Finally, it is obvious from the correlation analysis that Perceived Web Security has a major impact on both Attitude and the Intention to Use Internet Banking which account for 0.857 and 0.677 respectively. Regarding the hypothesis of this study, all the hypotheses are tested and accepted at the 0.01 level of significance as shown in the previous chapter.

5.3 Implications of the Study

The implication of these findings and conclusions are that, banks need to play a leading role in influencing the perception, and there by the Attitude, Intention and behavior of current and potential internet banking users. Bank managers should concentrate on the factors which have the major impact on customer's intention to use internet banking. These factors as it is clear from this study are Perceived Usefulness, Perceived Ease of Use, and Perceived Web Security and Attitude which have significant relationship with the intention to use internet banking as it was shown in the previous chapter. Therefore, this study is significant to provide useful information for bank management in formulating IB marketing strategies. In general, the outcome of this study has two practical implications and recommendation for banks.

5.3.1 Push Strategy

Awareness of internet banking services is essential in the early adoption stages. As internet banking services are still considered to be new among students in UUM, effective presentations using all forms of media advertising such as leaflets, brochures, web pages, etc., will be useful to introduce the services to

a wider audience and educate potential customers about the benefits of internet banking. To access more potential adopters, information about internet banking should be provided by bank tellers and bank assistants at branches. The information should include references to "time saving", "convenience" at anywhere any time, "low costs", and "information availability". In addition, banks should design their web sites as effective delivery channels and offer information beyond banking services (Jaruwachirathanakul and Fink, 2005).

It is essential to provide a well-designed and user-friendly web site to attract potential adopters' attention. The customer should not be required to expand a lot of effort or time, or undergo too great a change in behavior, to adopt internet banking services.

Information and instructions on the web should be provided in both Malay and English in order to make the adopter comfortable. Wide publicity underscoring the benefits and ease of use by demonstrating internet banking services should be provided. This could be implemented by providing personal computers at bank branches accompanied by good documentation and bank assistance. Regular surveying of customers' responses and opinions of the services should be conducted to ensure continuous improvement (Jaruwachirathanakul and Fink, 2005).

The findings of this study seems to be consistent with that of (Jaruwachirathanakul and Fink, 2005).

In summary, recommendations for "supplier push" strategies are as follows:

1. Build customers' recognition of internet banking: Emphasize the advantages of internet banking services, i.e. time saving, low cost services, and convenience and information availability; and provide various types of information both financial and non-financial.

2. Attract customers to the web site: provide a well-designed and user-friendly web site; provide information in both Malay and English languages; provide demonstrations in public places, e.g. bank branches, department stores, etc; provide both electronic and documentary demonstrations of online services; and regularly survey customers' responses to internet banking procedures and further develop the web site.

3. Attract customers by ease of access: regularly monitor customers' access; implement traffic management systems for internal and external users; co- ordinate services with internet service providers.

4. Build customers' confidence: present the security used in both technical and non-technical terms; outline the procedure and information on how to cope with problems if they occur; and provide instructions on how to use internet banking services safely.

5. Other strategies: offer incentives such as free internet access dial-up, frequent user benefits, member rewards, etc.

5.3.2 Pull Strategy

Banks should develop internet diffusion strategies by adopting "pull" strategies. Increased diffusion will increase the number of internet banking adopters since they are likely to come from the internet population. Furthermore, support from the government and the industry regulator will positively affect internet banking services by increasing the confidence of the adopters.

Effective co-operation among banks has to be developed. The value of internet banking is increased by linking one activity with other both within banks and with outside suppliers, channels and customers (Porter, 2001). Furthermore, banks should collaborate with internet service providers because it will enable banks to better control quality of services as well as enhance adopters' accessibility. In addition, a high quality internet infrastructure should be provided since it is one of the primary requirements for internet usage. (Jaruwachirathanakul and Fink, 2005).

The findings of this study seems to be consistent with that of (Jaruwachirathanakul and Fink, 2005).

In summary, recommendations for "market pull" strategies are as follows:

1. Increase service value by collaboration: collaborate with internet service providers; offer free internet access; expand banking service across banks; and increase linkages to suppliers and merchants.

2. be proactive: support the government to enact electronic commerce laws; work with the industrial regulator; and provide education on the uses of the internet and

internet banking.

Customer-targeting strategies Internet banks should focus on people with high purchasing power as the first priority and attempt to shift them online. This requires extensive analyses of customers' needs and the provision of customized services that are of value to them.

5.4 Recommendations for Future Studies

There are several recommendations and suggestions that can be discussed and potentially used by other researchers in future study to enhance better outcomes. Several areas for additional research become evident while conducting this study. In terms of the sample itself, customers in other Malaysian cities could be surveyed in which different population size and cultural configurations could have a major role in determining the Intention to Use internet banking in Malaysia. In this way, perhaps more valid generalizations of the present results could be made relating to the Intention to Use Internet Banking. In term of time, since our research was performed with time constraint, as with other cross-sectional studies, it is not without limitations. A wider scope of study for a full investigation of the pre-launch stage, the promotion stage and the post-launch stage of IB would surely be an important contribution to the IB literature in the future.

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APPENDIX: The questionnaire

Part A:

I. Demographic characteristics of the respondent (Please circle your choice of answer)

1. Gender: Male / Female

2. Age group: <20/ 21–25 / 26–30 / 31–40 / >40

II. General questions (Please circle your choice of answer)

Internet usage habit:

1. I have access to the Internet: No / yes at home / yes at university
2. Months using IB : < 3M / 3–6M / 6–12M / >12M / N.A.

N	Questions	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
3.	I use IB frequently	1	2	3	4	5	6	7
4	I encounter problem frequently in using IB	1	2	3	4	5	6	7
5.	I use IB service frequently as source of information	1	2	3	4	5	6	7
6.	I use IB from more than one bank frequently	1	2	3	4	5	6	7
7.	Besides IB, I use frequently other banking channels (ATM, branch teller, phone banking...)	1	2	3	4	5	6	7

Part B:

Please respond to questions below by circling your choice (1=strongly disagree, 7=strongly agree)

N	Questions	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
Perceived Ease of Use								
1.	Using the Internet Banking service is easy for me	1	2	3	4	5	6	7
2.	I find my interaction with the use of the Internet Banking services clear and understandable	1	2	3	4	5	6	7
3.	It is easy for me to become skillful at the use of the Internet Banking services	1	2	3	4	5	6	7
4.	Overall, I find the use of the Internet Banking services easy	1	2	3	4	5	6	7
Perceived Usefulness								
5.	Using the Internet Banking would enable me to accomplish my tasks more quickly	1	2	3	4	5	6	7
6.	Using the Internet Banking would make it easier for me to carry out my tasks	1	2	3	4	5	6	7
7.	I would find the Internet Banking useful	1	2	3	4	5	6	7
8.	Overall, I would find using the Internet Banking to be advantageous	1	2	3	4	5	6	7
Perceived Web Security								
9.	I would feel secure sending sensitive information across the	1	2	3	4	5	6	7

	Internet Banking							
10.	The Internet Banking is a secure means through which to send sensitive information	1	2	3	4	5	6	7
11.	I would feel totally safe providing sensitive information about myself over the Internet Banking	1	2	3	4	5	6	7
12.	Overall, the Internet Banking is a safe place to transmit sensitive information	1	2	3	4	5	6	7
Attitude								
13.	Using Internet Banking is a good idea	1	2	3	4	5	6	7
14.	I would feel that using Internet Banking is pleasant	1	2	3	4	5	6	7
15.	In my opinion, it would be desirable to use Internet Banking	1	2	3	4	5	6	7
16.	In my view, using Internet Banking is a wise idea	1	2	3	4	5	6	7
Intention to Use								
17.	I would use the Internet Banking for my banking needs.	1	2	3	4	5	6	7
18.	Using the Internet Banking for handling my banking transactions is something I would do	1	2	3	4	5	6	7
19.	I would see myself using the Internet Banking for Handling my banking transactions	1	2	3	4	5	6	7

Thank you for your cooperation and participation all Information provided will be confidential.