

# Internet Banking: An Empirical Study Of Adoption Rates Among Midwest Community Banks

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## ABSTRACT

*As the internet becomes more important for commerce, internet websites are playing a more central role in most companies' business plans. The success of internet banking is determined not only by banks or government support, but also by customers' acceptance of it. Online banking acceptance has gained special attention in academic studies during the past several years as banks move toward implementing internet banking as part of their overall strategy. The business benefit of internet banking is to generate additional revenue, improve customer service, extend marketing, and increase cost savings. In accepting the internet and maximizing its potential, there are several stages that firms evolve through that involve different roles. These different stages of changes are reflected in the many levels that are present when firms go through the adaptation of new technology, including internet banking. From the literature review, some key questions were identified, especially to what extent banks should modify their internet services for customers. The aim of this paper was to identify those areas in which the banks could improve or modify their services to increase the adoption rate of internet banking. Data were gathered from non-internet banking users via a survey questionnaire. The results of the respondents were analyzed using Structured Equation Modeling (SEM) from which the hypotheses were tested and conclusions drawn. The results from the survey indicated that customers find it difficult to use internet banking services, which leads to a decrease in the adoption of internet banking.*

**Keywords:** Internet Banking, E-commerce, SEM, TAM

## INTRODUCTION

Since the mid-1990s, there has been a fundamental shift in banking delivery toward using self-service channels, such as online banking. During the past several years, online banking acceptance has been rapid and current worldwide. Approximately 74% of the private banking customers in Finland are regular users of internet banking services (The Finnish Banker's Association, 2004). In general, Europe has been, and still is, the leader in online banking technology and usage.

As the internet becomes more important for commerce, internet websites are playing a more central role in most companies' business plans. An especially elegant case has been made for the "Internet-only" business model in the banking industry. Eliminating the need for physical branch offices results in the reduction of overhead expenses. Banks can then use the resulting savings to reduce their loan interest rates or increase their deposit interest rates, attracting new customers without sacrificing earnings. The web-based distribution focus allows banks to enter new geographic markets without the costs of acquiring existing banks or starting up new branches, further increasing growth potential.

By comparison, from 1995 to 2005, the percentage of internet users in the USA had risen from 13% to 42 and 43% respectively (Fox and Beier, 2006). Although in recent years this number has grown rapidly, there is some evidence supporting the opposite; i.e., that online banking acceptance is faced with problems. Robinson (2000), for instance, found that half of the people who tried online banking services will not become active users.

Online banking, in this study, is defined as an internet portal through which customers can use different kinds of banking services, ranging from bill payment to making investments. Therefore, banks' websites that offer only information on their pages - without the option to make transactions - are not qualified as online banking services.

The success of internet banking is determined not only by banks or government support, but also by customers' acceptance of it. The customer has a great influence on the adoption of internet banking (Pikkarainen, Pikkarainen, Karijaluoto, and Pahnala, 2004) as they ultimately decide on whether they will use internet banking based on their individual needs. If the service can clearly show the benefits and how they address customers' needs, then customers are more likely to use it. Previous research into internet banking has mainly focused on innovation adoption in the context of North America and Europe (Pikkarainen et al., 2004) and to some degree, other areas, such as Turkey (Polatoglu and Ekin, 2001).

However, a study on potential factors influencing internet banking adoption in different regions of the USA may provide useful insights as to what factors are critical to the customers by specific regions, as different regions throughout the USA may have different needs that determine success. The goal of this article is to increase our current understanding of the critical factors that influence online banking acceptance and usage for small banks in the Midwest regions. More accurately, online banking acceptance will be studied using the factors that are important from the success point of view, referring to the idea that consumers are using banks' information systems (online banking services) directly. Hence, more knowledge on the factors that affect information systems' adoption is needed in order to better understand and facilitate the acceptance.

### **The Internet Banking Environment**

The internet distribution channel can add value to banking franchises in a number of ways, depending on whether it is used to augment physical branches (click-and-mortar banks) or in place of physical branches (internet-only banks). The strategic core of the click-and-mortar banking model is to route standardized, low-value-added transactions (e.g., bill payment, balance inquiries, account transfers, credit card lending) through the inexpensive internet channel, while routing specialized, high-value-added transactions (e.g., small business lending, personal trust services, investment banking) through the more expensive branch channel. By providing an option for customers who want to do some, but not all, of their banking over the internet, a click-and-mortar bank may be better able to retain its most-profitable customers. In contrast, the strategic core of the internet-only business model is to reduce overhead expenses by completely eliminating the physical branch channel.

Most internet-only banking franchises in the United States have struggled for profitability. Some have exited the market via acquisition, voluntary liquidation, or regulatory closure. Others have remained in the market, but changed strategies, augmenting their transactional websites with physical branches. Similarly, a number of the large banking companies that launched "trade name" internet-only ventures, such as Washington-Mutual, have integrated these business units back into the main bank. However, a small number of internet-only banking franchises have achieved some measure of profitability and (at the time this article was prepared) remain committed to this business model in the long run.

This article is divided into four parts: The first part contains a literature review on online banking and information systems acceptance. The second part presents the research methodology used in this work. The third is comprised of the results and analysis where the data is analyzed using Structured Equating Modeling (SEM). The final part consists of the conclusions and practical implications of the research.

## **LITERATURE REVIEW**

### **Online Banking Acceptance Studies**

Online banking acceptance has gained special attention in academic studies during the past five years as banking journals have devoted special issues on the topic (Mukherjee and Nath, 2003). Two reasons can be established for online banking development and diffusion. First, banks can save costs by offering online banking

services. It has been proven that the online banking channel is the cheapest delivery channel for banking products once established (Giglio, 2002). Second, banks can reduce their branch networks and downsize the number of service staff, which opens the way for online banking as many customers feel that branch banking requires too much time and effort. Therefore, time and cost savings and freedom from place have been found to be the main reasons for underlying online banking acceptance (Howcroft, Hamilton and Hewer, 2002).

Online banking offers many benefits to banks, as well as to customers. However, when comparing globally, the percentage of online users is not as high in the USA as in other regions of the world. There can be several reasons for this, such as customers need to have access to the internet in order to utilize the service; new online users need first to learn how to use the service; non-users often complain that online banking has no social dimension; i.e., they are not served in the same way as in a face-to-face situation in a branch; and there are issues of security and privacy.

Organizations invest in information systems for many reasons; for example, to cut costs, to produce more without increasing costs, or to improve the quality of services or products (Lederer, Hamilton and Hewer, 1998). It has been noted that users' attitudes toward and acceptance of a new information system have a critical impact on successful information systems adoption (Davis, 1989; Davis and Venkatesh, 1996). If users are not willing to accept the information system, it will not bring full benefits to the organization (Davis, 1993; Davis and Venkatesh, 1996). The more accepting of a new information system the users are, the more willing they are to make changes in their practices and use their time and effort to actually start using the new information system (Succi and Walter, 1999).

Researching the literature dealing directly with influences on consumer adoption of internet banking services revealed a fragmented and inconclusive theoretical base:

- Demographics may be relevant. In the uptake of electronic banking – which includes ATMs, phone banking, internet banking and other electronic banking forms – Kolodinsky, Hogarth and Shue (2002) found that the likelihood of adoption rose with higher levels of financial assets and education, but that individual consumer attitudes and beliefs were stronger influences than demographics. In addition, recent studies confirm earlier reports of difficulties attracting the 65+ age group to internet banking (Ilett, 2005; Perumal and Shanmugam, 2004). Gender issues may also be relevant. Shergill and Li's (2005) study of internet banking consumers found that women regarded privacy protection and ethical standards more seriously than did men. Nevertheless, in some countries, such as the UK, women now equal men in numbers using internet banking (Ilett, 2005), raising new questions about the nature of gender differences found in internet banking adoption.
- Convenience has been identified by a number of studies as an important adoption factor (ACNielsen, 2005; Pew, 2003; Ramsay and Smith, 1999; Thornton and White, 2001). A U.S. survey found the main motivator for internet banking to be convenience in terms of 24/7 access and time savings (Pew, 2003). Interestingly, Chung and Paynter (2002) found that many people who did not use internet banking believed they did not need high levels of convenience. Accessibility, which may be related to convenience, has been found important (Ramsay and Smith, 1999). High levels of workplace internet use have also been associated with the uptake of internet banking (Durkin, 2004).
- The relevance of internet banking as an innovation has been found significant. Tan and Teo's (2000) survey of (mostly male) internet users employed Ajzen's (1985) theory of planned behavior and Rogers' (1985) theory of innovation diffusion and identified the main influences as: perceptions of relative advantage, compatibility, trialability, and risk. All but risk are known constructs in Rogers' (1985) theory of innovations diffusion. Also supporting the importance of trialability, Chung and Paynter (2002) found that lack of prior use of internet banking inhibited consumer adoption. Their survey further found that consumers who did not use the internet channel did not feel a need to do so, suggesting the importance of relative advantage. In a related finding, Sathye's (1999) study highlighted that many consumers were simply unaware of internet banking and its unique benefits.
- Adaptability, technical self-efficacy and knowledge of the internet banking application have been found influential, suggesting that individual characteristics affect the adoption decision (Thornton and White, 2001). The desire for control of service delivery was found important by Ramsay and Smith (1999) while

habit may also play a role (Wan, Luk and Chow, 2005). The information provided on the banking website may help provide needed knowledge and thus help to motivate adoption (Waite and Harrison, 2004).

- Security, privacy, trust and risk concerns may impact consumer internet banking choices. It was found that 80% of global phishing attacks in the first quarter of 2005 targeted the financial services sector (IDC, 2005). One survey by Chung and Paynter (2002) identified consumer fears regarding transaction security as an inhibitor to the adoption of internet banking. Security has also been identified as a key consumer concern in other internet banking adoption studies (e.g. Black, Lockett, Winklhofer and McKechnie, 2002; Siu and Mou, 2005). In the context of consumer attitudes toward internet banking systems, trust may be related to consumer judgment on security and privacy issues (Wang, Wang, Lin, and Tang, 2003). Suh and Han (2002) found trust to be an important factor in consumer adoption of internet banking using a web-based survey, while Rexha, Kingshott and Aw (2003) obtained similar results in Singapore.

Given the wide range of contributing theories and factors identified in the literature, it was felt that existing insights on consumer adoption of internet banking were insufficiently mature for there to exist a solid foundational basis from which to explore this topic, especially given the ever-changing parameters of a digital environment and an increased need for service-oriented knowledge management. Therefore, it was decided to draw on new data and use an interpretive approach based on grounded theory, while taking note of the established research reviewed in this section.

### **Online Banking Trends**

Traditional banks have been at the forefront of online banking channel development and control the majority of the total market (Pikkarainen et. al, 2004). However, the online banking channel also works without having an extensive branch network (Lowe, A., 2001). In recent years, there has been a rise of pure online banks, but their impact on the whole banking sector has been minimal. Pure online banks often use other channels as well, such as contact centers (both outbound and inbound), and some have even established physical presences by establishing branch services. Many pure online players have suffered from a lack of sufficient customer base and thus have had to close down their business.

Despite the setbacks with pure online banks, online banking is the fastest growing service that banks can offer in order to gain and retain new customers (Moody, 2002). By the end of 2004, 86% of community banks in the USA had a web presence, an increase from 66% in 2001. As can be seen from these figures, internet banking is growing in the USA and there is further growth potential. For new entrants, this would seem a lucrative market. However, some critics are not so quick to accept the internet banking boom and foresee some crucial issues for existing and new entrants.

However, despite the surge of banks toward adopting an internet presence, customers' adoption rates are low, and their interest in internet banking is waning. Weeldreyer (2002) states that in 2000 there were 60 internet-only banks; however, that number has now dwindled to about 20.

The business benefit of the internet, according to Gow (1997), is to generate additional revenue, improve customer service, extend marketing, and increase cost savings. Banks enjoy these benefits as well. In an article entitled "Next-Generation Retail Banking" (Compaq, 2001), the business drivers for internet banking included:

- Additional transaction revenues. Banks can derive revenues over and above their offline revenues by charging for online services and value-added services, such as providing a portal for financial services linked to short- and long-term insurers, links to stock brokers, and links to foreign banks.
- Savings from reduced transactional costs. On the internet, customers serve themselves, negating the need for frontline staff. Savings are gained from reductions in staff, reduction in branch sizes, and reduction in consumable costs, such as paper, ink cartridges, and other stationery.
- Opportunities for acquiring new customers. Customers looking for the flexibility and convenience offered by internet banking will be attracted to banks providing the best services. Existing customers can be sold products that they do not have in their portfolio, such as a second credit card, life insurance, and home loans, among others.

- Improved ability to retain customers. Customer relationship management (CRM) can be facilitated by the data acquired and captured on the corporate database. Products and services can be customized to suit the needs of the customer or groups of customers, thus facilitating customer loyalty.

The internet has become a customary member of the banking family of services. However, its evolution is far from over. There are a number of challenges facing internet bankers and these factors are different and unique to each region and environment due to customer expectations and needs.

One major issue could be that banks are forgetting the traditional rules of business, such as listening to customers and delivering the satisfaction that they are willing to pay for. Weeldreyer (2002) advises that banks need to know who they are serving, what their needs and problems are, and what their financial priorities are. The mistake that online merchants, and now online banks, are making is redesigning the organization strategy to become an electronic strategy, rather than developing a strong organization strategy that incorporates an electronic strategy. These contrasting viewpoints give rise to the question, "Why would banks want to have an internet presence?"

### **E-Commerce Strategies In Banking**

Many banks have taken a different approach to internet banking by setting up independent e-commerce organizations. According to Fox and Beier (2006), there is an increasing segment of customers who prefer to do business through the new, more virtual channels. Moreover, it is easier to accommodate these customers by starting a new company than by adapting an existing one. In this respect, it is then a process of "natural selection"; i.e. cannibalizing your own customers by creating a new company or be eaten by the new online competition (Daniel, 2000). It is also suggested that the market will eventually find a natural balance between the traditional and virtual company.

Although it is effective because it waits for the market to decide, this approach is time-consuming, costly and rather reactive than proactive. The alternative is to move forward with a purposeful management of channel mix options within the existing company (Durkin and Howcroft, 2003). If successful, this approach allows the firm to utilize all the knowledge and experience it has of its customers to the maximum.

In addition, such a purposeful and integrated approach offers a clear vision and sends a consistent message to the market and to customers. These considerations are especially important when one considers the importance of branding and trust in online business. This approach also gives employees a sense of direction and purpose, which is important because the commitment of employees in the implementation of any change process has been shown to be crucial (Bennett and Durkin, 2000). Indeed, recent research has shown that many banks are now considering moving the separate virtual business back under the parent brand due to high costs. It is reported that many of the new virtual banks having spent huge resources on promotional activity are generating relatively little interest amongst consumers. One reality is that online banking has not really succeeded; many customers still need the reassurance of visiting their branch.

If technology gets too far ahead of the business, banks won't be able to accommodate the customer; if business gets too far ahead of the technology, banks won't be able to deliver to the customer.

Such a dilemma about technological influence raises the question as to how banks can differentiate themselves and in what ways will the bank-customer relationship change. In addressing these questions, it is appropriate to examine what factors are important to the organization's current and potential customers in their adoption of internet banking (IB).

### **Stages in Adopting the Internet**

In accepting the internet and maximizing its potential, there are several stages that firms evolve through that involve different roles. These different stages of changes are reflected in the many levels that are present when firms go through the adaptation of new technology. These stages, whether for a matured firm or a firm in the introductory stage, would also apply to a bank adapting or using IB. According to Parsons, Zeisser and Whitman

(1996), firms go through four major stages. The first phase is information presentation, which involves the initiative to launch a basic on-line service for the purpose of presenting information to the customers. It will involve one-way communication (such as information about products and services) or may involve two-way communication (where customers may provide feedback). In this stage, the primary purpose of using the internet is from a marketing perspective - to enhance the image or provide information.

The second stage is the transaction stage. Here a small full-time technical group is established for maintenance of the website. The direction at this stage is still not clear and straight; the site is mainly used as a platform where customers can carry out basic transactions. In the third stage, the internet grows and develops its own structure and marketing-related functions. The on-line structure begins to gain the status of a stand-alone unit conducting its own activities and with its own objectives. In the fourth stage, the internet structure is in transformation of the firms’ business unit(s). The internet is not only used as an interface between firm and customers, but also as means of reshaping the core business by opening up new business nationally and internationally.

In implementing IB, banks will go through different levels of development varying from a marketing approach (involving changing the presentation and interactivity) to a strategic approach (redefining the business model). Whether a bank envisions a marketing-oriented approach or a business-oriented approach will depend on the degree to which they are willing to adapt IB, as well as the target market understanding and acceptance of IB.

**Table 1: Summary of Research Findings on Factors Associated with Internet Banking Adoption**

<b>Factors</b>	<b>Gerrard and Cunningham (2003)</b>	<b>Liao and Cheung (2002)</b>	<b>Mattila et al. (2003)</b>	<b>Moutinho and Smith (2000)</b>	<b>Rotchanakitumnuai and Speece (2003)</b>	<b>Sathye (1999)</b>	<b>Wang et al. (2003)</b>
<b>Ease of use</b>	Complexity,PC proficiency	Expectations of user-friendliness	Perceived difficulty in using computers	Ease of banking		Lack of awareness about IB	Perceived ease of use
<b>Transaction security Transaction accuracy Speed</b>	Confidentiality	Expectations of security Expectations of accuracy Expectations of network speed			Security	Security concerns	Perceived credibility
<b>Convenience</b>	Convenience, accessibility, compatibility	Expectations of convenience		Convenience			
<b>Provision of different personal services Social desirability Usefulness</b>	Social desirability						Perceived usefulness
<b>Economic benefits User Involvement</b>	Economic benefits	Expectations of user involvement					

**Review of IB Adoption**

Marketing literature has studied IB from various different points of view. Some studies analyze growth in IB, while others describe the benefits to be gained from IB for an organization, and other studies focus on the factors of privacy and security. A condensed summary of the various factors related to IB adoption is mentioned in Table 1.

An attempt was made to highlight the commonalities of these studies by grouping similar findings from different studies into the same column. The most commonly identified factors are ease of use, beliefs of transaction security, speed, and convenience. Although these factors are important in the virtual environment, the belief of this paper is that there are other factors that also influence the adoption of IB. Such factors will be identified and are believed to be customer driven rather than technology or marketing driven.

### Factors in Consumer Adoption of Internet Banking

A generic theoretical framework (Figure 1) shows that a bank must first attract banking consumer *attention* to the internet banking service before the consumer will consider internet banking. However, unless the consumer has a high level of internet *accessibility* at home or at work, they are unlikely to consider using internet banking. The consumer also assesses whether it is convenient to conduct their banking that way (*convenience*), how usable the application appears (*usability*), and their perceived competence of internet use and banking application use (*self-efficacy*). The four factors of accessibility, self-efficacy, convenience and usability are interrelated. The consumer also considers whether the perceived relative advantages of internet banking, compared with other banking forms, outweigh perceived risks and costs. In addition, the availability of sufficient support and in depth knowledge from the bank and its employees contribute significantly to the adoption decision.

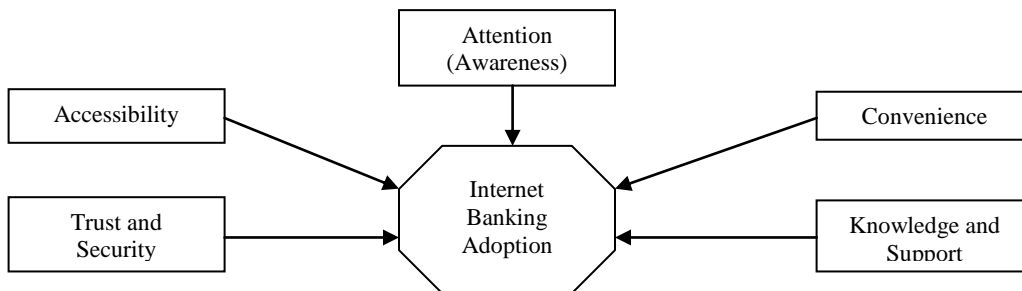


Figure 1: Key factors in consumer adoption of IB, a generic theoretical framework

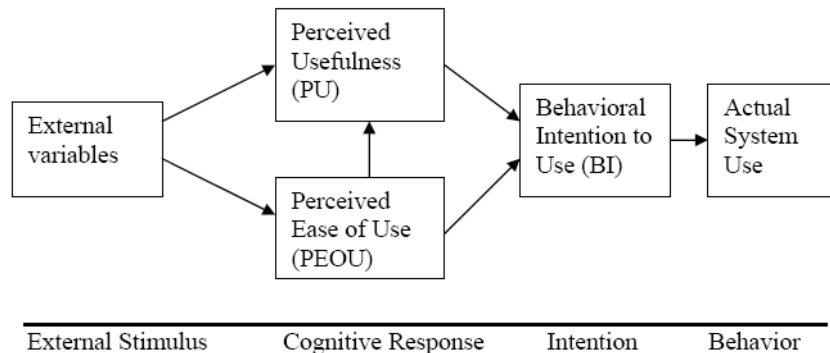
### TAM and related studies

Organizations invest in information systems for many reasons; for example, cutting costs, producing more without increasing costs, or improving the quality of services or products (Lederer et al., 1998). It has been noted that users' attitudes toward - and acceptance of - a new information system have a critical impact on successful information system adoption (Davis, 1989; Venkatesh and Davis, 1996; Succi and Walter, 1999). If users are not willing to accept the information system, it will not bring full benefits to the organization (Davis, 1993; Davis and Venkatesh, 1996). The more accepting of a new information system the users are, the more willing they are to make changes in their practices and use their time and effort to actually start using the new information system (Succi and Walter, 1999).

A system that satisfies users' needs reinforces satisfaction with the system and is a perceptual or subjective measure of system success. Similarly, usage of a system can be an indicator of information system success and computer acceptance in some cases. Whether the system is regarded as good or bad depends on how the user feels about the system. Especially if the users do not rely on the system and its information, their behavior toward the system could be negative. Success is not necessarily dependent of the technical quality of the system (Ives, Olson and Baroudi, 1983). Using the system is connected with the effectiveness of the system - systems that users regard as useless cannot be effective. Therefore it is important to find out the reasons why people decide to use or not to use information system (IS). This knowledge will help both systems designers and developers in their work (Mathieson, 1991).

One of the most utilized models in studying information system acceptance is the technology acceptance model (TAM) (See Figure 2) in which system use (actual behavior) is determined by perceived usefulness (PU) and perceived ease of use (PEOU) relating to the attitude toward use that relates to intention and finally to behavior.

- Perceived ease of use (PEOU), defined as “the degree to which a person believes that using a particular system would be free of effort”
- Perceived usefulness (PU), defined as “the degree to which a person believes that a particular system would enhance their performance”



(Davis and Venkatesh, 1996<sub>1</sub>)

**Figure 2: Technology Acceptance Model (TAM)**

According to the TAM, these two beliefs are of primary significance for computer acceptance. PU refers to the prospective user's subjective likelihood that the use of a certain application will increase his or her performance. PEOU is defined as the degree to which the prospective user expects the potential system to be free of effort (Davis et al., 1989). According to DeLone and McLean (1992), system use, as the dependent variable, is acceptable if system usage is not compulsory. TAM has been tested widely with different samples in different situations and proved to be a valid and reliable model explaining information system acceptance and use (Mathieson, 1991; Davis and Venkatesh, 1996).

TAM is based on the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), which is concerned with the determinants of consciously intended behaviors (Ajzen and Fishbein, 1980; Davis, Bagozzi and Warshaw, 1989). Development of TRA started in the 1950s and the first research concerning this theory was published in 1967 (Ajzen and Fishbein, 1980). Since 1967, TRA has been developed, tested and used extensively; and its extension, the theory of planned behavior (TPB) (Ajzen, 1991), has been utilized widely. It has been proven successful in predicting and explaining behavior across a wide variety of domains and is based on the assumption that consumers behave rationally and that they collect and evaluate systematically all of the available information. Additionally, TRA assumes that people also take into account the effects of their possible actions and, based on this reasoning, they make a decision whether or not to take action (Ajzen and Fishbein, 1980). Individuals would use computers if they have a feeling that there could be positive benefits (outcomes) associated with using them (Compeau and Higgins, 1995). From the information system's perspective, one relevant element of TRA is its assertion that any other factor that influences behavior - for example, systems design variables, user characteristics, task characteristics, political influences and organizational structure - do so only indirectly by influencing attitude toward behavior, subjective norm or their relative weights (Davis et al., 1989).

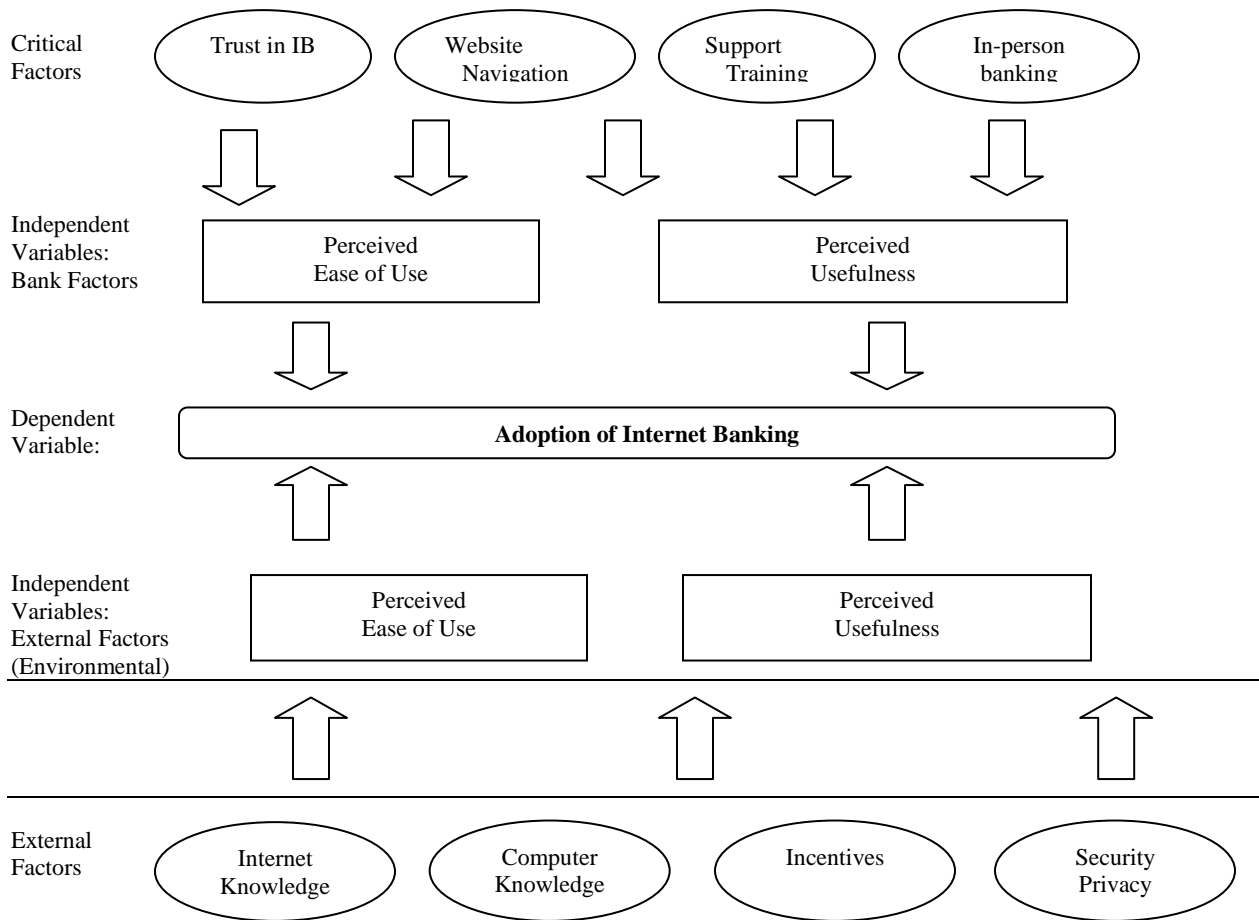
**The Model**

Based on the preceding study of current bank customers, a model indicating the acceptance of online banking was developed (See Figure 3). The model consists of factors hypothesized to have an effect on acceptance of internet banking.



TAM is an adaptation of the Theory of Reasoned Action (TRA) to the field of IS. TAM envisions that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use. Perceived usefulness is also seen as being directly impacted by perceived ease of use. Researchers have simplified TAM by removing the attitude construct found in TRA from the current specification (Venkatesh, Speier and Morris, 2002). Attempts to extend TAM have generally taken one of three approaches: by introducing factors from related models, by introducing additional or alternative belief factors, and by examining antecedents and moderators of perceived usefulness and perceived ease of use (Wixom and Todd, 2005).

**Factors and Their Relationship to TAM**



**Figure 3: Critical success factors of IB**

The following five dimensions (See Figure 4) have been identified as common determinants of predicting the adoption of internet banking and other types of e-commerce. Therefore, they have been selected for closer investigation through the TAM model, which provides the conceptual model for this research.

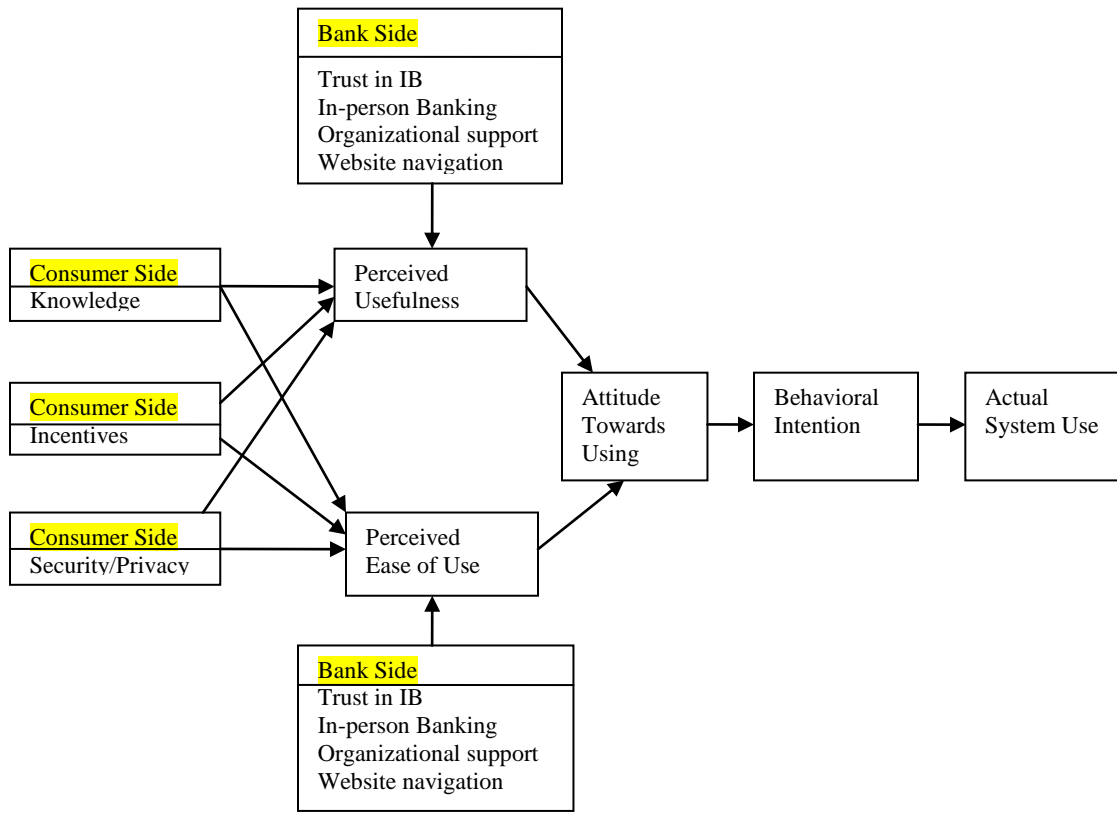


Figure 4: The expanded TAM for use in the IB study, the conceptual framework

**Perceived Usefulness:** “The degree to which a person believes that using a particular system would enhance their performance” (Davis, 1989)

**Perceived Ease of Use:** “The degree to which a person believes that using a particular system would be from effort” (Davis, 1989)

**Trust in IB:** A person’s estimate of their faith in using a particular system

**In-person Banking:** A person’s preference for using the branch

**Organizational Support:** The importance of support a customer received from their own organization

**Website navigation:** A person’s ability to find their way around a particular website

**Incentives:** The amount of influence that an organization effects its’ customers

**Security/Privacy:** The degree of faith that an organization will handle all transactions securely and privately

**Knowledge of IB**

The amount of knowledge consumers have about IB has been identified as a major factor impacting the adoption. According to Sathye (1999), while the use of IB services is a fairly new experience to many people, low knowledge of IB services and benefits is a major factor in causing people not to adopt IB. Hence, we posit that:

- H1a.** The amount of knowledge a consumer has about IB has a positive effect on Perceived Usefulness
- H1b.** The amount of knowledge a consumer has about IB has a positive effect on Perceived Ease of Use

*Incentives*

The importance of offering incentives is not new in the marketing environment. Without some sort of reward system or compensation system, encouraging the use of IB will be difficult, especially for hard-line customers. Hence we posit:

- H2a.** The quality of the incentives has a positive effect on Perceived Usefulness
- H2b.** The quality of the incentives has a positive effect on Perceived Ease of Use

*Security and Privacy*

The importance of security and privacy to the acceptance of online banking has been noted in many banking studies (Sathye, 1999; Hamlet and Strube, 2000; Tan and Teo, 2000; Polatoglu and Ekin, 2001; Black et al., 2002; Giglio, 2002; Howcroft et al., 2002). To be more precise, privacy and security were found to be significant obstacles to the adoption of online banking in Australia (Sathye, 1999). Roboff and Charles (1998) found that people have a weak understanding of online banking security risks, although they are aware of the risks. Furthermore, they found that consumers often trust that their bank is more concerned about privacy issues and will protect them. Finally, they argue that although consumers' confidence in their bank is strong, their confidence in technology is weak (Howcroft et al., 2002).

Users want to control what kind of data is collected, the purpose, length of time it is recorded, and reasons why it is processed (Kobsa, 2001; Kobsa, 2002). Gathering and recording user data without consumers' awareness is a major concern (DePallo, 2000).

Trust, security, and privacy are multi-dimensional constructs and need further explanation. In this article, the concentration is only on the aspects consumers are most concerned about, which are interest in the level of confidence in the technology and willingness to adopt the online banking service, as provided. Thereby, the following hypotheses are proposed:

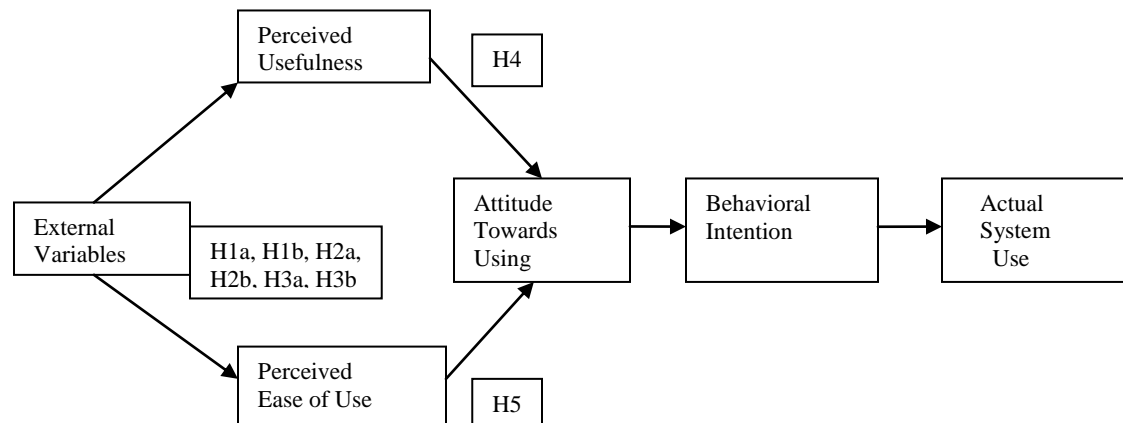
- H3a.** Security and privacy have a positive effect on Perceived Usefulness
- H3b.** Security and privacy have a positive effect on Perceived Ease of Use

*Perceived Usefulness PU and Perceived Ease of Use PEOU*

TAM posits that PU is a significant factor affecting acceptance of an information system (Davis et al., 1989). Davis defined PU as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). In the online environment, perceived usefulness is about the perception of the usefulness of making purchases over the internet. Therefore, in this study, it is defined as the extent to which a person believes that using IB will create value for them.

According to TAM, PEOU is a major factor that affects acceptance of information system (Davis et al., 1989). PEOU is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989). In the online environment, perceived ease of use is about the perception of the ease of using IB. Therefore, in this study, it is defined as the extent to which a person believes that using IB will be free from effort or effortless for them. Hence, an application perceived to be easier to use than another is more likely to be accepted by users. By applying these into online banking context, we hypothesize:

- H4.** Perceived usefulness (PU) has a positive effect on consumer adoption of IB
- H5.** Perceived ease of use (PEOU) has a positive effect on consumer adoption of IB



**Figure 5: The measurement model for the study based on TAM**

The structural paths for the model (See Figure 5) represent the following hypothesis to be tested.

- H1a.** That consumer knowledge of IB has an effect on Perceived Usefulness  
**H1b.** That consumer knowledge of IB has an effect on Perceived Ease of Use
- H2a.** That the quality of the incentives has an effect on Perceived Usefulness  
**H2b.** That the quality of the incentives has an effect on Perceived Ease of Use
- H3a.** That security and privacy have an effect on Perceived Usefulness  
**H3b.** That security and privacy have an effect on Perceived Ease of Use
- H4.** That the perceived usefulness (PU) affects customers' adoption of IB
- H5.** That the perceived ease of use (PEOU) affects customers' adoption of IB

### Methodology

A number of key questions stem from the literature review, specifically to what extent banks should modify their internet services for customers. Particularly, which financial services are best delivered over the internet, and how can the internet add value to the bank-customer relationship. In addressing these fundamental questions, the research had two primary objectives: 1) to gain an insight into how relationship-oriented banks position themselves with regard to internet delivery and the services that they provide, and 2) to better understand the influences on the customer's decision to use internet banking.

In addressing these issues, three discussion themes were incorporated into the questionnaire. These themes are:

1. to measure the attitudes of non-users with respect to critical success factors toward IB in this region
2. the type of products and services important from the customer's perspective for IB
3. to understand the characteristics and behavior of non-users of IB

The research study initially involved in-depth interviews with bankers in the Midwest region of the USA. All the sample banks had traditional branch networks, positioned themselves as being relationship-oriented and had already introduced the internet into their business. A total of three interviews were conducted at the respondents' place of work or via telephone networking and each lasted for approximately 90 minutes. Interviews were conducted with executives and senior managers with special responsibility for IB and internet strategy. The reason for these

interviews was to persuade the banks to participate and inform them of the nature and purpose of the study. The study was intended to view the IB from the customer's vision and to identify those areas in which the banks could improve or modify their products and services to increase the number of IB users within their own existing customer base. In order to achieve this, a detailed questionnaire was developed and sent to customers of these participating banks at random.

### **Data Collection Instrument**

The data for the study was gathered through an undisguised questionnaire. It was pre-tested several times among various faculty members, as well as managers in the banking sector, with special responsibility for IB in order to verify face validity of the items. The purpose of the pretest was to address any misunderstanding of the wording of the questions.

The questionnaire was formalized using literature on IB and other banking studies, measuring customer behavior, satisfaction and service quality. The first part of the questionnaire includes questions about internet habits and usage. The second part of the questionnaire consists of questions regarding the usage of IB services, measuring the satisfaction of customers already using these services and actions that a current user may take when using the services. The third part was for those who are not currently IB users. It measures their inhibitors and determines other factors that are important to non-users, as well as their intention to adopt this service if these factors were available or addressed. The fourth section included the demographic characteristics of the sample, such as gender, age, education level, employment, income, and accessibility.

The main purpose of the questionnaire was to identify the key factors that are important to facilitate current users and the factors that inhibit usage among non-users of IB in the Midwest regions.

### **Data Analysis**

In analyzing the questionnaire, means, frequencies and reliability were initially calculated using SPSS software, and content validity of the questionnaire was established by reviewing existing literature. Also, the test for 'goodness of fit' SEM was performed. The multivariate technique of SEM was chosen for this study because it can:

- analyze the relations between both the unobservable (latent) and observable variables
- test the validity of the causal structure

The technique has two stages. The first is the measurement model, which specifies how well the constructs are measured in terms of the observed variables. The second is the structural model, which focuses on the relationships among the constructs.

The survey questionnaire captured background data for study participants. Overall, 362 non-IB users' questionnaires were useable and 37 were considered invalid. The respondents in this study were relatively older adults, with 45.7 percent under 36 years of age and 31.1 percent between 36 and 51 years of age (See Table 2).

In terms of computer experience, about 18.7 percent of respondents were beginners to intermediate, 32.8 percent were considered average, and 48.5 percent had above-average experience with computers. This is also consistent with previous research, which found that internet users have above-average computer experience because it requires computer awareness and internet skill.

Regarding internet experience, 82.4 percent had more than three years of internet experience, 10.7 percent had two to three years, 2.7 percent had one to two years, and only 4.2 percent had less than one year of experience using the internet.

**Table 2: Demographics of Study Sample-362 Subjects**

Age		Mean: 38.97 years old Range: 18-79 years old
Gender		Male: 49.6% Female: 50.4%
Frequency of Internet Purchases	Number of purchases made through the internet in past year	Zero : 34.4% 1-5 14.5% 6-10: 11.8% 11 or more: 39.3%
Extent of computer Knowledge	Average self rating; (1-Novice, 7-Expert)	4.96
Extent of Web knowledge	Average self rating; (1-Novice, 7-Expert)	4.69

**Table 3: Construct and associated latent variables; mean scores and reliability scores**

Construct/Latent Variables	Mean	Reliability Cronbach's alpha
<b>Knowledge in5, in6, in11</b>		.587
Having the correct computer equipment is important for IB	3.96	
Having the correct computer knowledge is important for IB	3.94	
I don't know how to use IB services	3.37	
<b>Incentives in9, in10, in12</b>		.680
My bank doesn't offer incentives to use IB services	3.37	
My bank doesn't offer training to use IB services	3.29	
I prefer face-to-face banking	3.82	
<b>Security/Privacy in1, in2, in3</b>		.877
I am concerned about the security of IB services	4.13	
I am concerned about the privacy of IB services	4.14	
Trust in IB services is important to me	4.36	
<b>Perceived usefulness in8, in14</b>		.592
It is important to have 24hr. support for IB services	3.79	
Understanding the website details is important for IB	4.08	
<b>Perceived ease of use in4, in7, in13</b>		.623
IB services are important for my banking needs	3.62	
Comfortable using computer equipment is important for IB	3.94	
Navigating the website easily is important for IB	4.11	

**Table 4: Reliability of Study**

Scale	Cronbach's Alpha	Composite Factor Reliability	Average Variance Extracted (AVE)	Number Of Items
Knowledge	0.587	0.621	0.625	3
Incentives	0.680	0.692	0.696	3
Security/Privacy	0.877	0.970	0.942	3
Perceived Usefulness	0.592	0.521	0.555	2
Perceived Ease of Use	0.623	0.639	0.641	3

## THE MEASUREMENT MODEL: TESTING FOR INTERNAL CONSISTENCY

### Reliability Analysis

PLS (Partial Least Squares) was used to assess the reliability of the measures in addition to the Cronbach's alpha (See Table 3). The Cronbach's alpha evaluates the proportion of variance attributable to the true score of the

variable the researcher intends to measure. It reflects the consistency of the measure and the homogeneity of the items in the scale. PLS evaluates the individual item reliability and presupposes no distribution form (like multi-normality) of the data (Gopal, Bosrom and Chin, 1992). PLS is recommended to evaluate the loadings of each item with its construct. These loadings should be higher than 0.5 (ideally higher than 0.70) which indicates that significant variance is shared between each item and the construct. In this study, to further increase the reliability levels, items were dropped when their removal meant that the level of reliability would increase.

Average Variance Extracted (AVE) was calculated as a measure of reliability of the construct (See Table 4). The acceptable level of AVE is 0.50 (Chin, 1998). This indicates that more than 50% of the variance of the indicators has to be accounted for by the latent variables. All the constructs exceed the minimum AVE level and therefore demonstrate sufficient reliability.

### **Validity**

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study's success at measuring what the research sets out to measure. There are two types of validity used to analyze scale evaluation: content and construct validity.

Content validity refers to the representativeness and comprehensiveness of the items used to create a scale. It is a qualitative assessment of whether the items in a scale capture the real nature of the construct as it is in the real world. To establish content validity of the scale, an initial set of items was compiled from previous literature dealing with online trust in ability, integrity and benevolence. The entire set of items was examined and a suitable subset of the items that applied to online consumer behavior was then chosen for this study. This consists of definitions of user participation, user attitude and user beliefs.

Construct validity looks at the extent to which a scale measures a theoretical variable of interest. It seeks agreement between a theoretical concept and a specific measuring device or procedure, such as a questionnaire. To understand whether a research has construct validity, three steps should be followed. First, the theoretical relationships must be specified. Second, the empirical relationships between the measures of the concepts must be examined. Third, the empirical evidence must be interpreted in terms of how it clarifies the construct validity of the particular measure being tested. Construct validity can be broken down into two sub-categories: convergent validity and discriminant validity.

Convergent validity refers to the extent to which multiple measures of a construct agree with one another or is the actual general agreement among ratings, gathered independently of one another, where measures should be theoretically related. In this study, convergent validity was assessed through the use of Partial Least Squares Method. Under this method, the item loadings of the indicators for each construct, called item reliability, were evaluated (See Table 5). These item loadings should be greater than 0.71 for each individual loading (Chin, 1998).

The traditional methodological complement to convergent validity is discriminant validity, which represents the extent to which measures of a given construct differ from measures of other constructs in the same model. One criterion for adequate discriminant validity is that a construct should have a higher variance with its own measures than it shares with other constructs in a given model. To assess discriminant validity, the use of Average Variance Extracted is employed (i.e., the average variance shared between a construct and its measures).

Discriminant validity was evaluated using Partial Least Squares method by examining the following: (1) item loadings and cross loadings of the indicators within its own construct and other constructs and (2) comparing the correlation among the construct scores against the square root of the average variance extracted (AVE). The item loadings on its own construct should be higher than on other constructs and the correlation scores should be lower than the square root of the AVE for its own construct (See Table 6).

Table 5: Loading and Cross Loading of Model Latent Variables

Indicator	Knowledge	Incentives	Security	Perceived Usefulness	Perceived Ease of Use	Intent to Use
in5	<b>0.7571</b>	0.087	0.000	0.029	0.105	0.000
in6	<b>0.7691</b>	0.048	0.011	0.030	0.005	-0.042
in11	<b>0.8236</b>	0.071	-0.058	-0.066	-0.062	0.000
in9	-0.009	<b>0.8006</b>	-0.006	-0.024	0.028	0.013
in10	-0.043	<b>0.8297</b>	-0.027	-0.005	0.017	-0.019
in12	0.006	<b>0.8402</b>	0.004	-0.036	-0.044	0.012
in1	-0.015	0.002	<b>0.9675</b>	-0.016	-0.049	0.022
in2	0.003	-0.013	<b>0.9737</b>	-0.038	-0.024	0.071
in3	-0.039	0.026	<b>0.8129</b>	-0.015	0.005	-0.029
in4	-0.005	0.039	0.062	<b>0.7823</b>	0.001	0.021
in7	0.007	-0.039	-0.045	<b>0.8444</b>	-0.051	-0.046
in13	-0.023	-0.012	-0.037	<b>0.7689</b>	0.031	-0.009
in8	-0.054	-0.039	-0.007	-0.019	<b>0.9797</b>	-0.013
in14	-0.073	-0.021	0.013	-0.015	<b>0.9118</b>	-0.045
in15	0.036	0.006	-0.024	0.035	-0.015	<b>0.8072</b>

Table 6: Correlation among Variable Scores (Square Root of AVE in Diagonals)

Indicator	Knowledge	Incentives	Security	Perceived Usefulness	Perceived Ease of Use	Will to Adopt
Knowledge	<b>0.791</b>					
Incentives	0.171	<b>0.834</b>				
Security	0.232	0.125	<b>0.971</b>			
Perceived Usefulness	0.396	0.284	0.442	<b>0.745</b>		
Perceived Ease of use	0.247	0.650	0.179	0.279	<b>0.801</b>	
Will to Adopt	0.176	0.311	0.068	0.360	0.210	<b>1.000</b>

### The Structural Model: Testing for Significance

In order to validate the theoretical model and make inferences with regard to the hypotheses, data analysis was performed using the Path Analysis method. Model fit was analyzed as a measure of the validity of the model and statistical significance of the path coefficients were used to make conclusions about the hypotheses. Table 7 shows the standardized regression coefficients ( $\beta$ ) named “path coefficients” in SEM terminology, as well as the T-statistics and  $R^2$  values.

Under PLS,  $R^2$  values of endogenous variables are used to determine the fit of the model. Interpretation of the  $R^2$  values is similar to ordinary least squares method regression. The results of the data analysis, including the  $R^2$  values, are pictorially presented in Figure 6.

$R^2$  values measure the construct variance explained by the model. The  $R^2$  for “behavioral intention,” the endogenous variable to be explained, is 0.143. For the rest of the variables, “perceived usefulness” is 0.447 and “perceived ease of use” is 0.322.

A standardized path coefficient analyzes the degree of accomplishments of the hypotheses. Chin (1998) suggests that they should be greater than 0.3 to be considered significant.



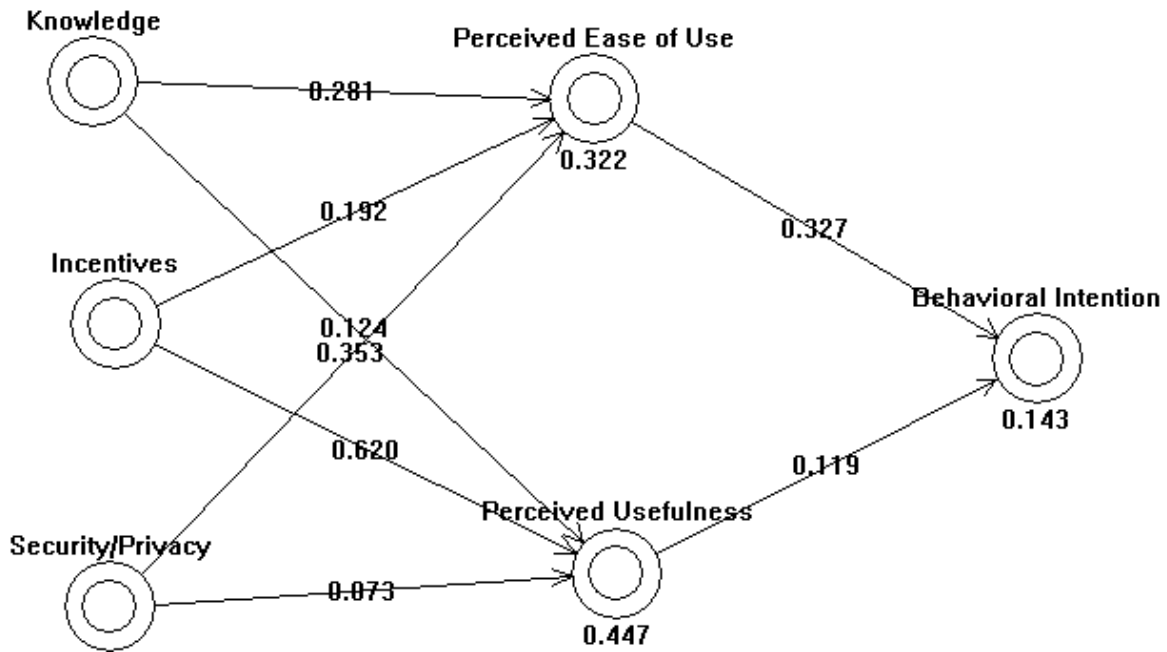


Figure 6: The structural model for the study based on TAM

Table 7: Statistical Significance of Coefficients

Endogenous Variable	R <sup>2</sup>	Independent Variable	Standardized Coefficient	T-Statistic	P-Value less than
Perceived Usefulness	0.447	Knowledge	0.124	1.315	0.121
		Incentives	0.620	6.598	0.030*
		Security/Privacy	0.073	1.327	0.127
Perceived Ease of Use	0.322	Knowledge	0.281	4.584	0.045*
		Incentives	0.192	0.997	0.184
		Security/Privacy	0.353	1.632	0.101
Willingness to Adopt IB	0.143	Perceived Usefulness	0.119	1.984	0.071
		Perceived Ease of Use	0.327	8.954	0.001***

\*p < .05 \*\*p < .01 \*\*\*p < .001

**H1a:** That consumer knowledge of IB has an effect on Perceived Usefulness

As shown in Table 7, the path coefficient from knowledge to Perceived Usefulness is 0.124 (p-value < 0.121), which is not statistically significant at the 0.05 level. This suggests that the hypothesis is not supported and that knowledge of IB doesn't have any effect on how useful the process may be to consumers. As a result, hypothesis H1a is rejected.

**H1b:** That consumer knowledge of IB has an effect on Perceived Ease of Use

As shown in Table 7, the path coefficient from knowledge to Perceived Ease of Use is 0.281 (p-value < 0.045), which is statistically significant at the 0.05 level. This suggests that the hypothesis is supported and that knowledge of IB does have an effect on how the system (IB) would be easy to use (effortless) for consumers. As a result, hypothesis H1b is accepted.

**H2a:** That the quality of the incentives has an effect on Perceived Usefulness

As shown in Table 7, the path coefficient from the quality of the incentives to Perceived Usefulness is 0.620 (p-value < 0.030), which is statistically significant at the 0.05 level. This suggests that the hypothesis is supported and that the quality of the incentives of IB does have an effect on how useful the process may be to consumers. As a result, hypothesis H2a is accepted.

**H2b.** That the quality of the incentives has an effect on Perceived Ease of Use

As shown in Table 7, the path coefficient from the quality of the incentives to Perceived Ease of Use is 0.192 (p-value < 0.184), which is not statistically significant at the 0.05 level. This suggests that the hypothesis is not supported and that the quality of the incentives of IB doesn't have any effect on how the system (IB) would be easy to use (effortless) for consumers. As a result, hypothesis H2b is rejected.

**H3a:** That security and privacy have an effect on Perceived Usefulness

As shown in Table 7, the path coefficient from security and privacy to Perceived Usefulness is 0.073 (p-value < 0.127), which is not statistically significant at the 0.05 level. This suggests that the hypothesis is not supported and that security and privacy of IB doesn't have any effect on how useful the process may be to consumers. As a result, hypothesis H3a is rejected.

**H3b.** That security and privacy have an effect on Perceived Ease of Use

As shown in Table 7, the path coefficient from security and privacy to Perceived Ease of Use is 0.353 (p-value < 0.101), which is not statistically significant at the 0.05 level. This suggests that the hypothesis is not supported and that security and privacy of IB doesn't have any effect on how the system (IB) would be easy to use (effortless) for consumers. As a result, hypothesis H3b is rejected.

**H4:** That the perceived usefulness (PU) affects customers' adoption of IB

As shown in Table 7, the path coefficient from perceived usefulness (PU) to willingness to adopt IB is 0.119 (p-value < 0.071), which is not statistically significant at the 0.05 level. This suggests that perceived usefulness (PU) doesn't influence consumers' willingness to adopt IB. When consumers are not aware of how the system can enhance their lives or performance, they are less likely to use or participate in the system; in this case, not adopt IB. As a result, hypothesis H4 is rejected.

**H5:** That the perceived ease of use (PEOU) affects customers' adoption of IB

As shown in Table 7, the path coefficient from perceived ease of use (PEOU) to willingness to adopt IB is 0.327 (p-value < 0.001), which is statistically significant at the 0.05 level. This suggests that perceived ease of use (PEOU) does influence consumers' willingness to adopt IB. When consumers recognize that a system is easy to use or effortless, they are likely to participate and employ the system; in this case, adopt IB. As a result, hypothesis H5 is accepted.

As indicated by the R<sup>2</sup> values, the model fit was weak for Willingness to Adopt IB (0.141), but strong for Perceived Usefulness (0.447) and Perceived Ease of Use (0.322). As summarized in Table 8, three of the hypotheses were supported and five were not supported.

**Table 8: Summaries of Hypotheses Results**

<b>Hypotheses</b>		<b>Supported</b>
H1a	That consumer knowledge of IB has an effect on Perceived Usefulness	No
H1b	That consumer knowledge of IB has an effect on Perceived Ease of Use	Yes
H2a	That the quality of the incentives has an effect on Perceived Usefulness	Yes
H2b	That the quality of the incentives has an effect on Perceived Ease of Use	No
H3a	That security and privacy have an effect on Perceived Usefulness	No
H3b	That security and privacy have an effect on Perceived Ease of Use	No
H4	That the perceived usefulness (PU) affects customers' adoption of IB	No
H5	That the perceived ease of use (PEOU) affects customers' adoption of IB	Yes

## DISCUSSION AND CONCLUSIONS

The analysis of the study focused on the reliability and validity of the data and measurement model, and the path coefficients and goodness of fit of the structural model. The constructs displayed strong internal reliability on three measures: Cronbach's Alpha, Composite Reliability and Average Variance Extracted (AVE). The constructs also demonstrated strong convergent and divergent validity. High indicator construct loadings showed strong convergent validity, whereas strong divergence was shown by the cross loadings results. Also shown is the square root of the AVE whose own construct value was higher than the variables of other constructs.

The  $R^2$  for Willingness to Adopt is 0.141 (14.1%), reflecting that the model does not provide a strong explanation of the variance. This indicates that the model can't be used as a good method of explaining what causes these differences and is not useful in predicting Willingness to Adopt, which is synonymous with intent to use IB.

In addition, we are interested in learning how well the antecedents alone can predict adoption of IB. Because these factors can be measured during the stages of IB, some predictions can be made based on the antecedents to guide management on the factors to consider when marketing IB services to non-users. In order to assess the plausibility of these factors, the structural model can be visualized in individualized segments.

The  $R^2$  for Perceived Usefulness is 0.447 (44.7%) and Perceived Ease of Use is 0.322 (32.2%). These represent a strong explanation of the variance of these endogenous variables. And although the beta coefficients ( $\beta$ ) are not strong for each of the exogenous variables, analyzing them separately will help to isolate individual measurements that can be useful.

This study hypothesized (5) antecedents to Willingness to Adopt, (3) exogenous and (2) endogenous to measure non-users of IB and factors that are important to them. The study found that two of these independent variables - quality of incentives and knowledge of computers – significantly predict expectations within the theoretical model. As well, Perceived Ease of Use (how the system will be free of effort) of the IB system is an important factor in adopting IB services.

While separately these factors can't statistically predict IB adoption, understanding how these factors are important to consumers would be useful for management. These direct-effect models provide a good indicator as to what is considered important to non-IB users.

In the *service* environment, consumers are involved in the assembly and consumption of services due to the inseparability dimension of services. In the IB environment, the inference of inseparability is complicated due to the lack of social presence; i.e., the sellers of the service are not available physically at the point of usage. Thus, consumers have to complete the process without interaction from service providers.

Consumers may therefore find it difficult to use online IB services, leading to a decrease in their intention to adopt IB. In response, companies need to standardize their IB services to make the service as simple as possible for consumers to use. At the same time, they need to develop more effective websites that offer clear and precise instructions, so as to provide adequate support for users of their services.

By boosting the ease of use of IB services, combined with bank defined incentives, banks in the Midwest region would stand a better chance to increase the adoption rate of IB users, and from a management's perspective, it may be worthwhile to move these factors to the forefront of their IB marketing programs.

## AUTHOR INFORMATION

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