Chapter 3
LITERATURE REVIEW
3.1 Theoretical Background of Internet Banking Adoption

In order to welcome the method in the wake of factors affecting customers’ attitude and behavioral intention in adopting the internet banking for conducting their financial services and online banking transactions, it is essential to discuss thorough understanding of the theoretical foundation behind adoption of technology. Several models that have been developed in the past and built up on each another were studied in this research.

In the technological context of internet banking adoption the following models or theories are reviewed and discussed. These are:

a) Technology Acceptance Model (TAM) by Davis (1989) - which focuses on user’s adoption or not adopting to use information technology.

b) Theory of Reasoned action (TRA) by Fishbein and Azjen (1975) - Explains and predict the determinants of intended behaviour of individuals.

c) Theory of Planned Behaviour (TPB) by Ajzen (1991) - Extended TRA by adding perceived behavioral control constructs.

d) Diffusion of Innovation (DOI) by Rogers (1983) - recognized factors that are significant in the decision to adopt an innovation.

e) Social Cognitive Theory (SCT) by Brown (1999) - which focused on factors which act as motivator of established cognitive, social, and behaviourial skills in adoption of technology.

f) Institutional Theory (IST) which addresses three institutional pressures - coercive, normative and mimetic playing an influential role in the acceptance of technology.
3.2 Technology Acceptance Model (TAM)

Since past years, Technology Acceptance Model (TAM) is the most widely accepted and researched model in the regarding user acceptance of information technology. The model stems its root from TRA, which was originally proposed by Fishbein and Ajzen in 1975. TAM model predicts and explain the users acceptance or adoption of information technology. This theory focuses the reasons why users either accept or don’t accept information technology. Davis (1993), defined in TAM, intention is a function of attitude and perceived usefulness (PU). Attitude is “the degree of evaluative affect that an individual associates with using the target system”.

Davis et al. (1996) revised model added used external variables i.e. external stimulus, perceived usefulness and perceived ease of use (cognitive response), behavioural intention, and actual usage.

![Technology Acceptance Model Diagram](image)

**Fig.3.1: Technology Acceptance Model**

Perceived usefulness (PU) and perceived ease of use (PEOU) pressure the users’ intention to use information technology either directly or mediating via attitude towards the behaviour intention, leading to actual usage of the system. Attitude and Behavioural Intention are the common attributes among the TAM and TRA model.

Perceived ease of use (PEOU) has a strong control on Attitude through perceived usefulness, and also directly controls it. Perceived Usefulness (PU) has a strong direct influence through attitude and behavioural intention. The original TAM was revised by parting attitude from the model, but empirical study proved that behavioural intention to use is only partly mediated by attitude (Davis and Venkatesh. 1961).
Time to time the TAM model has been modified to have a good explanation in explaining the user acceptance of technology.

Further Davis and Venkatesh (2000) extended the theory and they created TAM2. TAM2 had additional constructs i.e. social influence processes i.e. subjective norm, voluntariness, and image and cognitive instrumental processes i.e. job relevance, output quality, result demonstrability, and perceived ease of use.

TAM is able to explain 40% of the variance in behavioral intention to use and usage behaviour, which supplementary supports the perception of TAM’s suitability in adoption of internet banking research (Legris et al 2003, Pikkarainen et al. 2004). Ajzen (2002) stated intention is an indication of a person's readiness to perform the given behaviour and actual behaviour is the manifest, observable response in a given situation with respect to a given target. The present research takes into consideration, internet banking acceptance as the actual behaviour.

According to Davis (1993), Attitude is defined as the ‘the degree of evaluative affect that an individual associates with using the target system in his / her job’. East (1997), defines attitude is what we feel about a concept, which may be any entity about which we can think and to which we can attach feeling. Swanson (1988) and Davis et al. (1989), in their research proved attitude plays an important role in adopting computer technology and actual usage (e.g., Ives et al. 1983; Swanson 1987). Ajzen and Fishben (1980) suggested two types of attitude:
Chapter 3

(i) Attitude toward objects – a person’s affective evaluation of a specified attitude object.

(ii) Attitude is attitude toward action (behaviour) – a person’s affective evaluation of specified behaviour involving the object.


Bagozzi, et al. (1992) found that TAM’s attitudinal determinates outperformed TRA’s. Legris et al. (2003) also noted the critical importance of examining external variables, since they are the ultimate drivers for the use of technology. Zumd (1979), had examined the role of external variables i.e. cognitive, personality, situational and demographics variables on the effect of technology usage are

Adams et al. (1992) had studied TAM in different application areas like word processors, graphics, spreadsheets, e-mails etc.) and found TAM model maintained its consistency and validity in explaining users’ acceptance of information technology.

3.2.1 Technology Acceptance Model and Internet Banking

Lai et al. (2001) concluded in their research TAM is a well suitable instrument for evaluating Internet banking acceptance, but also that the suitability is independent of the respondent characteristics such as gender, age and information technology competence.

Moon and Kim (2001) investigated the application of TAM in World Wide Web (WWW). The TAM model has been extended in their study by adding a new construct of perceived playfulness which is “based on an individual intrinsic motivation theory”. In addition to the perceived ease of use and perceived usefulness, perceived playfulness was revealed play an important role on user’s attitude toward using the WWW.

Karjaluoto et al. (2002) built a model based on TRA and TAM, which was empirically tested with private Finnish retail bank customers and validated the model and concluded prior computer experience, prior technology experience , personal banking experience, reference group and computer attitudes strongly affecting attitude and usage Behaviour towards internet banking. .
Suh and Han (2002), had taken an extra variable trust and added to the TAM model and conducted their research in South Korea among customers of five banks and had found trust plays an important role in the acceptance of internet banking.

Sudarraj et al. (2003) used deconstructed TAM to measure the importance of usefulness and ease of use in online and telephone banking.

Wang et al. (2003), focused on trust in their research. In addition to the PU, PEOU, Perceived self efficacy they had introduced perceived credibility (PC) to TAM. They found PEOU and PC were significant than PU and Surprising results were found: perceived ease of use and perceived credibility were more significant than perceived usefulness in predicting the behavioral intention to use Internet banking. Majority of TAM related research has concluded that PU is the influencing factor over PEOU. For increasing the predictive power of TAM, Davis (1993) suggested the role of external variables in the TAM model.

Snoj et al. (2004) find that users do not use a system for its own sake but instead use it because of its attributes that drive value, according to the utility provided by the combination of attributes, less the disutility represented by any sacrifices required to use the system.

Ndubisi and Jantan (2003) had evaluated information system usage in Malaysian SMEs, found that there was a positive relationship between computing skill and technical backing and Information system usage directly and indirectly through perceived usefulness and perceived ease of use.

Yang and Yoo (2004) argued that researchers fail to distinguish between the two types of attitudes, where the potentially significant influence of cognition attitude gets offset by the insignificant influence of affect attitude.

Eriksson et al. (2004) found in their study among Estonian private customers trust plays a vital role in the acceptance of internet banking. Trust had a significant positive effect on both perceived ease of use and perceived usefulness, where perceived usefulness is stronger in predicting the behaviors intention to use internet banking among the customers.
Chan and Lu (2004), in their research towards adoption of internet banking in Hong Kong, found that subjective norm, computer self-efficacy and perceived ease of use indirectly played significant roles in influencing the perceived behavioral intention to adopt Internet Banking in Hong Kong.

O’Cass and Fenech (2003), attitude plays an important role in the decision to adopt a new computer technology.

Chan et al. (2004), found in his study, customers will decrease or even will not use technology, if they feel there is a risk or loss in use of the technology, so he suggested degrees of risk that consumers perceive and their risk tolerance are the factors which affect their attitudes towards adoption of internet banking. Perceived risk is a attitudinal factor affecting adoption of internet banking.

Lassar et al. (2005), researched on online banking adoption in USA in the context of TAM and concluded intensity of internet usage significantly affects individual’s adoption of internet banking. These findings suggest consumers experienced in internet and computer usage and more likely to adopt internet banking than those not experienced.

Bruner and Kumar (2005), applied the TAM in context of online consumer behaviour and it has received empirical support through the numerous studies (Venkatesh and Davis, 2000).

King and He (2006) conducted a statistical meta-analysis of TAM as applied in various fields using 88 published studies and the results showed TAM to be a powerful, highly reliable, valid and robust predictive model that may be used in a variety of contexts.

Yiu et. Al (2007) and Michel et. Al (2009), added risk variables to get different results among customers using internet banking.

Hausman and Sickpe (2008), in the technology acceptance sphere, emphasized the relationship between attitude and intentions.

Lau & Woods (2008) and Teo (2008), in their study found the role of attitude towards use of TAM (Technology Acceptance Model). However attitude was removed from TAM as per the study conducted by Thompson, Higgins & Howell (1991).
Zumd (1979), further suggested, in a variety of disciplines, external variables that were used to explore the effect on technology usage are individual differences, such as cognitive, personality, demographic, and situational variables. These variables also play a role as an external variable in the TAM model and may influence the customer attitude in adoption of internet banking.

Jacoby and Kplan (1972), Havlena and DeSarbo (1990), Murray and Schlacter (1990), Stone and Gronhaug (1993), in their research specified perceived risk is categorized as financial, performance, physical, psychological, social and time risks.

In the IT context, a common and widely recognized barrier to e-commerce acceptance has been the lack of security and privacy over the Internet (Bhimani, 1996; Cockburn and Wilson, 1996; Quelch and Klein, 1996; Jarvenpaa and Todd, 1997; Miyazaki and Fernandez, 2000; Miyazaki and Fernandez, 2001).

Lim et al. (2010), in their study mentioned internet allows consumers to reach a large variety of products and services from companies around the world. From their study it suggests that consumers may get a wide variety of services if they adopt internet banking for their financial transaction.

Samah et al. (2011) and Mohd et al. (2011) in their study have expanded to find the progress of TAM. The studies have developed in a specific field or in a comprehensive study with meta analysis. In conjunction with the progress of diffusion innovation technology, TAM’s analysis has been employed in many areas of researches.

Read et al. (2011) has found Technology acceptance model as a dominant research models in studies of determinants of acceptance of IT.

Hsiao et. A (2011) concluded in his research TAM model plays a vital role in the prediction of acceptance of the information technology (IT).

Sheikh (2012) found in his research there exists a significant relationship between customers PEOU and PU of their attitude towards internet baking.
Moscato and Altschuller (2012) found that the greatest problem about the online banking is security. Banks should provide safe online platforms for their potential and existing customers in order to attract; earn their trust and make profit from them.

Cracknell (2004) discusses affording to go every day to the bank or paying a lot for a good protection in the online banking. It also discusses online banking types and attractiveness of them and the effect of the environment on the online banking decisions.

Candra S (2013), research conducted in Indonesia found PU give significant input to the perceived behavioral intention to use internet banking among the customers, while other attributes like risk, PEOU have no significant impact on the attitude towards using internet banking.

Sathyе (1999) conducted a study and found safety and security of transactions over the internet are the main concern among consumer for the adoption of internet banking. Consumers are more concerned about safety and security of the transaction over the internet. Further it was found in his study consumers will not be ready to accept or change from present familiar ways of banking to internet banking unless their specific need is satisfied.

Table 3.1: Summary of Prior Studies used TAM

<table>
<thead>
<tr>
<th>Study</th>
<th>Framework</th>
<th>Subject</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chan &amp; Lu (2004)</td>
<td>TAM2 and Social cognitive</td>
<td>Internet Banking</td>
<td>Subjective norms and self-efficacy play significant role in influencing the behavioural intention to adopt internet banking services. Effects of perceived usefulness and perceived ease of use on intention similar to other studies.</td>
</tr>
<tr>
<td>Chau &amp; Lai (2003)</td>
<td>Extended TAM</td>
<td>Internet Banking</td>
<td>Personalization, alliance services, task familiarity and accessibility were found to have significant influence to attitude through perceived ease of use and perceived usefulness.</td>
</tr>
<tr>
<td>Klopping &amp; Mckiney</td>
<td>TAM</td>
<td>e-Commerce</td>
<td>Perceived Usefulness is found to be more dominant predictor than perceived ease of use.</td>
</tr>
<tr>
<td>Davis 1989</td>
<td>TAM</td>
<td>E-mail &amp; file</td>
<td>High reliability for the PU &amp; PEOU.</td>
</tr>
<tr>
<td>Venkatesh &amp; Morris 2000</td>
<td>TAM</td>
<td>Data &amp; information Retrieval system</td>
<td>Women are influenced by PEOU &amp; SN in making their adoption decisions while men consider PU only.</td>
</tr>
<tr>
<td>Wixom &amp; Todd 2005</td>
<td>TAM</td>
<td>Data warehouse Predefined reporting software.</td>
<td>Results supported the application of information &amp; system satisfaction as external variables to traditional TAM</td>
</tr>
<tr>
<td>Teoh &amp; Md Nor (2007)</td>
<td>TAM</td>
<td>Mobile Banking</td>
<td>Perceived usefulness and perceived ease of use had a positive effect on the intention to use mobile banking. Additional factor that affect the intention to use mobile banking is perceived security.</td>
</tr>
<tr>
<td>Chen et al. (2002)</td>
<td>TAM</td>
<td>Virtual Store</td>
<td>Perceived ease of use had a positive effect on both perceived usefulness and attitude toward using the virtual stores. Perceived usefulness had a significant effect on attitude toward using the virtual stores. Attitude affected behavioral intention and behavioral intention significantly affected the actual usage.</td>
</tr>
<tr>
<td>Hu et al. (1999)</td>
<td>TAM</td>
<td>Telemedicine</td>
<td>Perceived usefulness was a significant determinant of attitude and intention. Attitude was a significant determinant of behavioral intention. However, perceived ease of use was not significant on both attitude and intention.</td>
</tr>
<tr>
<td>Lai and Li (2001)</td>
<td>TAM</td>
<td>Internet banking</td>
<td>Attitude towards technology determined intention to use. Attitude was determined by perceived ease of use and perceived usefulness.</td>
</tr>
<tr>
<td>Pikkarainen et al. (2004)</td>
<td>TAM</td>
<td>Internet Banking</td>
<td>Perceived enjoyment, information and privacy had an impact on the internet banking adoption.</td>
</tr>
<tr>
<td>Eriksson et al. (2005)</td>
<td>TAM</td>
<td>Internet Banking</td>
<td>Trust is an antecedent to PU &amp; PEOU.</td>
</tr>
<tr>
<td>Gumiting &amp; Ndubisi (2006)</td>
<td>TAM</td>
<td>Internet Banking</td>
<td>Self efficacy and prior computer experience have an indirect effect on BI through PU &amp; PEOU.</td>
</tr>
<tr>
<td>Ndubisi &amp; Sinti (2006)</td>
<td>TAM</td>
<td>Internet banking</td>
<td>Attitudinal factors (compatibility, complexity, trialability, risk) play a role in Internet banking adoption</td>
</tr>
<tr>
<td>Sheikh (2012)</td>
<td>TAM</td>
<td>Internet Banking</td>
<td>PU and PEOU plays role in attitude formation towards internet banking.</td>
</tr>
</tbody>
</table>
Several studies found perceived credibility has stronger influence on intention than perceived usefulness and perceived ease of use in Internet banking and mobile banking context. Among other variables that are reported influenced intention in prior studies, self-efficacy (Chan & Lu, 2004; Wang et al, 2003), perceived cost (Luarn & Lin, 2004), social contact (Riemenschneider and Harrison, 2003) and gender (Lederer, Mauphin, Sena & Zhuang, 2000) perceived enjoyment (Teo, Lim & Lai, 1999) are few of them.

3.3 Theory of Reasoned Action (TRA)

TRA is a widely accepted model in social psychology that can explain virtually any human behaviour (Fishbein & Ajzen, 1975). According to TRA, a person’s performance of a specified behaviour is determined by an intention (I) to perform the behaviour, \( B = f(I) \). Next, the intention is jointly determined by a person’s attitude (A) and subjective norm (SN) with relative weights estimated by regression coefficients (\( B = wA + wSN \)). Furthermore, a person’s attitude toward a behaviour is also determined by his salient belief (bi) on the consequences of performing the behaviour multiplied by evaluation (ei) of those consequences (\( A = Ebiei \)). Finally, an individual’s subjective norm (SN) is a multiplicative function of normative beliefs (nbi) and motivation to comply (mci), \( SN = Enbimci \). A notable aspect of TRA is the assumption that all other factors influencing behaviour indirectly through attitude, subjective norms, or relative weights (Davis, Bagozzi, & Warshaw, 1989).

The TRA hypothesizes that behaviour is predicted by an individual’s intention to engage in a given behaviour. Intention, in turn, is predicted by two factors, the individual’s attitude towards the outcome of the behaviour and by the opinions of the person’s social environment, which is called the subjective norm (Fishbein and Ajzen, 1975).

Attitude towards the behaviour reflects an individual’s evaluation or general feeling toward target behaviour. It indicates an individual’s positive or negative evaluation about performing the behaviour. The attitude toward behaviour is a product of beliefs about the behaviour and the individual’s evaluation of the outcome resulting from that behaviour. The theory postulates that the intention to perform behaviour will be higher when the individual has positive evaluation of performing the behaviour (Ajzen, 1991).
Fishbein & Ajzen (1975), in their study focused on, subjective norm refers to an individual’s perceived social pressure to perform or not to perform target behaviour. The subjective norm is a composite of normative beliefs about a certain behaviour and the individual’s motivation to comply with relevant others. Mathieson (1991) suggested normative beliefs indicate one’s perception of the influence the extent the individual wants to comply with the wishes of the referent other. People often act based on their perception of what others think they should do, and their intention to adopt behaviour is potentially influenced by people close to them.

Davis et al. (1989) and Mathieson (1991) found no significant effect of subjective norms on behavioural intention, while Taylor and Tood (1995) found opposite.

![Diagram of Theory of Reasoned Action (TRA)](source)

**Fig. 3.3: Theory of Reasoned Action (TRA) (Source: Fishbein & Ajzen(1975))**

**Table 3.2: Summary of prior Studies used TRA**

<table>
<thead>
<tr>
<th>Study</th>
<th>Framework</th>
<th>Subject</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bock, Zmud, Kim and Lee (2005)</td>
<td>TRA</td>
<td>Knowledge Sharing</td>
<td>TRA was used as a theoretical framework to investigate knowledge sharing intentions. Both attitude and subjective norm were found to influence behavioural intention of the respond to share.</td>
</tr>
<tr>
<td>Shih and Fang (2006)</td>
<td>TRA</td>
<td>Internet Banking</td>
<td>TRA was replicated and extended in the context of intention to adopt internet banking. Attitude was found to be significant, while subjective norm was not.</td>
</tr>
<tr>
<td>Wan et al. (2006)</td>
<td>TRA</td>
<td>Internet Banking</td>
<td>Demographics were strongly associated with adoption.</td>
</tr>
<tr>
<td>Loiacono, Watson, and Goodhue (2007)</td>
<td>TRA</td>
<td>Instrument development for Web site quality</td>
<td>TRA and TAM were utilized to develop an instrument that would facilitate consumer evaluation of websites. The 12 resulting dimensions showed strong measurement validity.</td>
</tr>
<tr>
<td>Khalil, Emad and Pearson (2008)</td>
<td>TRA</td>
<td>Internet Banking</td>
<td>Individuals’ behavioural intention to use internet banking is influenced by their attitude and subjective norm.</td>
</tr>
</tbody>
</table>
3.4 Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) refers to an individual’s perception of the presence or absence of requisite resources or opportunities necessary for performing a specific behaviour. Perceived behavioural control mediates the effect of control belief and perceived facilitation.

Ajzen & Madden (1986), pointed out control belief is defined as individual’s self confidence in his or her ability to perform behaviour, similar to self efficacy (Bandura, 1977) and perceived facilitation, which is defined as individuals’ assessment of the importance of those resources to the achievement of outcomes (Ajzen & Madden, 1986). As per the theory subject norm and attitude towards behavior are the determinant of behavioral intention. It also proposes that it represents a motivational element and cognitive demonstration which a person will work out to carry out the behavioral intention to use and the intention is an instantaneous cause of such behavior. It is also an immediate precursor of actual behaviour.

Shih and Fang (2004) presented a complete learning of the beliefs of individuals, their attitudes, subjective norms and perceived behavioral control, and how these can influence intention toward adopting Internet banking based on theory of planned behavior model. The TPB (Ajzen, 1985, 1991) is an extension of the well-known TRA (Fishbein and Ajzen, 1975). Both assert that behavior is a direct function of behavioral intention. With the TRA, that intention is modeled as the weighted sum of attitude and subjective norm (Fishbein and Ajzen, 1975). TPB formulated, at behavioral intention is a function of attitude and subjective norm .However, an additional construct, perceived behavioral control (PBC) is added to the TPB model to account for situations where individuals lack complete control over their behavior (Ajzen, 1985, 1991; Ajzen and Madden, 1986). Notably, a number of empirical studies have found a relationship between PBC and intention (Ajzen, 1991; Sparks et al., 1992). Perceived behavioral control refers to belief of the individual concerning control weighted ($c_{b_k}$) by the perceived facility ($pf_k$), that is, of the efficacy of the control factor in either inhibiting or facilitating the behavior. Control beliefs reflect the perceived difficulty (or ease) with which the behavior may be effected (Ajzen, 1991). Perceived facility acts as an importance weighting (Ajzen, 1991). The association between control beliefs and PBC have been demonstrated empirically (Ajzen
and Madden, 1986). For our empirical case of Internet banking, the control belief refers to knowing how to perform transactions via Internet banking (self-efficacy; Bandura, 1977) and facility refers to externally based resource constraints, such as time, money and resources. The key role of these factors reflects the perceived difficulty (or ease) with which the behavior may be effected (Ajzen, 1991).

The following sub-section highlights relevant literatures pertaining to the identified constructs within TPB, which subsequently leads to the development of respective hypotheses intended for this study.

i) **Attitude:** Attitude towards behaviour is defined as an overall evaluation of the likely outcomes of behaviour (Ajzen, 1991).

ii) **Subjective Norms:** People’s intentions to perform a particular action are a function of their perception that important others think they ought to do (termed subjective norms) (Ajzen, 1985, 1991).

Chiason and Lovato (2001) reported that subjective norms are a significant antecedent of information system’s adoption intention.

iii) **Perceived Behavioural Control:** Perceived behavioural control (PBC) is a general construct dealing, self-evidently, with consumer perceptions of whether a behavioural act is within their control.

Mathieson (1991) shows that behavioural control influences intention to use information system.

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**Fig.3.4: The Theory of Planned Behaviour (TPB) (Source: Ajzen (1991))**
3.5 Diffusion of Innovation Theory (DOI)

Rogers (1983) developed a diffusion of innovation (DOI) model to explain how the diffusion of innovations takes place in social systems. According to DOI theory, individuals collect and synthesis information about an innovation and compiling this information forms their perception about an innovation. Based on these perceptions, an individual may decide to accept or reject an innovation (Agarawal & Prasad, 1997; Moore & Benbasat, 1991).

According to Rogers, individuals’ perceptions of the attributes of an innovation and not the attributes as classified objectively by experts or change agents, affect the rate of adoption. Innovation attributes can explain the rate of innovation adoption. Most of the variance in the rate of adoption (49-87 per cent) is explained by the five perceived attributes of an innovation. These attributes are interrelated empirically but each is conceptually distinct, and the selection of these attributes is based on past research as well as a desire for maximum generality and succinctness:

Relative Advantage: is the degree to which an innovation is perceived as better than the idea it supersedes.

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

Complexity: is the degree to which an innovation is perceived as relatively difficult to understand and use.

Trialability: is the degree to which an innovation may be experimented with on a limited basis.

Observability: is the degree to which the results of an innovation are visible to others.

Rate of adoption is the relative speed with which an innovation is adopted by members of a social system, usually measured by the number of individuals who adopt a new idea in a specified period of time. In other words, it is a numerical indicator of the steepness of the adoption curve for an innovation. In addition to the five perceived attributes of an innovation, there are variables such as:
(1) Type of innovation (optional, collective, or authoritative)
(2) Communication channel (e.g., mass media or interpersonal)
(3) Nature of social system (e.g., norms, degree of network interconnectedness, etc.)
(4) Extent of change agents’ promotion efforts.

3.5.1 Research Applying the DOI Theory

Tornatz and Klein (1982) presented a meta analysis reviewing the innovation characteristics literature hypothesizing that perceived innovation characteristics can predict the adoption and implementation of various innovations. The ten innovation attributes most frequently addressed in the reviewed articles included Rogers’, as well as, cost, communicability, divisibility, profitability, and social approval. Having noted that some attributes were closely related, e.g., compatibility and observability or divisibility and trialability, the study ended with recommendations of an improved measurement of the various attributes in order to reduce the number and the need for further research to demonstrate that perceived characteristics of an innovation are consistently related to innovation adoption and implementation across settings.

Moore and Benbasat (1991) extended and refined Rogers model to develop an instrument that can be used across a variety of information system/technology innovation domains and at the same time robust enough to tap a variety of perceptions of innovations. They retained relative advantage, compatibility and trialability as original and renamed complexity as ease of use to be consistent with Davis’s (1989) TAM.

Agarwal & Prasad (1998), in their study referred to the fact, that an innovation is more likely to be adopted when it is compatible with an individual”s job responsibilities, value, and system.

Lehman & Markman (2001) investigated the psychological processes involved in consumers’ adoption decision and reported that prior product knowledge had a negative influence on adoption.

In the internet banking context, although Tan and Teo (2000) found that relative advantage, compatibility and trialability influence intention, complexity is found insignificant, which contradicted prior findings. In another empirical study in Turkey,
relative advantage is found to be one of the important factors affecting users’ adoption decisions (Polatoglu & Ekin, 2001).

Gerrard and Cunningham (2003), Compatibility is a measure of the values or beliefs of individuals, the ideas they have adopted in the past, and the ability of an innovation to meet their needs.

Table 3.3: Summary of Prior Studies Used DOI

<table>
<thead>
<tr>
<th>Study</th>
<th>Framework</th>
<th>Subject</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tan &amp; Teo (2000)</td>
<td>TPB+DOI</td>
<td>Internet Banking</td>
<td>Intention to adopt Internet banking can be predicted by attitude &amp; PBC but not by SN.</td>
</tr>
<tr>
<td>Gerrard &amp; Cunningham (2003)</td>
<td>DOI</td>
<td>Internet Banking</td>
<td>Adopters and non-adopters have same belief about desirability, confidentiality, accessibility, economic benefits etc.</td>
</tr>
<tr>
<td>Kolodinsky et al. (2004)</td>
<td>TAM+DOI</td>
<td>Internet Banking</td>
<td>Relative advantage and Compatibility were significant for e-banking</td>
</tr>
</tbody>
</table>

3.6 The Social Cognitive Theory

The social cognitive theory (SCT) stemmed from the social learning theory (SLT) which was launched in 1941 by Miller and Dollard’s publication of Social Learning and Imitation when they introduced the principle of learning through “Models”. Currently, subsets of theories based on SLT with emphasis on cognitive variables assert that human cognition mediates between stimulus and response, placing individual control over behavioural responses to stimuli. Although there are several versions of SLT, they all share three basic tenets:

**Tenet (1):** Response consequence such as reward / punishment influence an individual’s behaviour.

**Tenet (2):** Observational learning (vicarious learning) whereby humans can learn by observing others, in addition to learning by personally participating in an act.

**Tenet (3):** Identification: individuals likely to model behaviour observed by others they identify with or are emotionally attached to.
Many authors have contributed to the development of SLT over the years, among them Albert Bandura theory was the first to incorporate the notion of modelling (vicarious learning) as a social learning form. In addition, he introduced several other important concepts: reciprocal determinants, self efficacy, and the idea that a significant temporal variation in time lapse could occur between cause and effect. He renamed his version of social learning theory, social cognitive theory (SCT) (Brown, 1999).

3.6.1 Research Applying SCT

Bandura argued that some sources of influence are stronger than others and the interaction between the three factors would differ based on the individual, the particular behaviour being examined and the specific situation in which the behaviour occurred (Pajares, 2002). For instance, personal factors-behaviour interaction involves the influence of the individual’s thoughts and emotions, biological properties (such as sex, ethnicity, temperament, and genetic dispositions) and his/ her actions. The individual’s expectations, beliefs, self-perceptions, goals, and intentions shape and direct his/her behaviour. The second interaction of a bi-directional nature also occurs between the individual’s characteristics and the environment. Within such interactions, human expectations, beliefs, and cognitive competencies are developed and modified by social influences (conveying information, activating emotional reactions through factors such as modelling, instructions and persuasion) and physical structures (such as age, size, race, sex, and physical attractiveness) within the environment. The final interaction occurs between behaviour and the environment; a person’s behaviour is a product of the environment and vice versa. Thus, behaviour determines which of many potential environmental influences come into play and what forms they will take. In turn, the environment partly determines which form of an individual’s behaviour is developed and activated (Bandura, 1989).

According to Bandura, learning from models can take various forms, including new behaviour patterns, judgment standards, cognitive competencies and generative rules for creating new forms of behaviour, styles of inquiry, information processing skills, and standards of self evaluation. Observational learning is guided by four component sub-functions that evolve with maturation and experience: attention span, retention processes, motor reproduction processes, and motivational processes. Individuals selectively observe actions / behaviours in their environment, code them into symbols and use them as a guide
for future actions. The model and individual’s characteristics affect the type and amount of observation experienced. It is most likely that individuals selectively attend to models and behaviours they identify with such observed behaviours can only be modelled if retained in the individual’s memory. Retention is made by actively transforming and restructuring the information conveyed by observing models and events into rules and conceptions for memory representation. In the third sub-function, behavioural production process, symbolic conceptions are translated into appropriate actions. According to the fourth sub-function, motivational process, people do not usually perform all they learn. Performance of observationally learned behaviour is influenced by three types of incentive motivators: direct, vicarious, and self-produced (Bandura, 1989).

According to Bandura, three factors seem to determine the degree of self-motivation: self-efficacy; feedback; and anticipated time to goal attainment. If a person feels capable of achieving a goal, she / he is likely to work harder and give up less easily than a person with low self-efficacy. Feedback not only enables a person to adjust her / his efforts to make them more realistic but also feedback enhances a person’s self efficacy. Eventually, timely or proximal goals are more effective than distal ones in enlisting self-motivation. Social and moral standards also regulate behaviour. People develop moral standards from a variety of influences such as direct instructions, feedback on behaviours from significant others, and modelling of moral standards by others. Standards are also developed from institutionally organized systems such as religion, education, media, and legal and political agencies.

Nevertheless, people do not passively absorb all the standards of behaviour to which they are exposed. Instead, they internalize standards from models similar to themselves, from their perception of their locus of control, and from the value they assign to the activity involved in that behaviour. It is through the process of self-regulation that pro-social behaviour can be internally maintained.

Self-efficacy is defined as: “Peoples judgments of their capabilities to organize and execute courses of action required to attain designed types of performances. It is concerned not with the skills one has but with judgment of what one can do with whatever skills one possesses” (Bandura 1986, p391).
Bandura (2001) stated that efficacy beliefs are the foundation of human agency and unless people believe that they can produce desired results and prevent harmful ones through their actions, they have little incentive to act or preserve in the face of life difficulties. People develop adequate ways to deal with reoccurring situations; they act on their perceived efficacy without requiring continuing directive or reflective thought (e.g., learning driving skills in congested traffic). Once a skill is routinized, efficacy belief is no longer an important factor to develop that skill.

Thus, as long as people believe in their ability to perform a given activity, they act habitually on that belief until significant changes occur in task demands or situations; then their belief of personal efficacy is promptly reappraised as a guide for action under changing conditions (Bandura, 1997).

3.6.2 Self-Efficacy and Computing

SCT is considered a valid model of individual behaviour, widely accepted and empirically validated (Igbaria & Iivari, 1995; Compeau & Higgins, 1995). Of specific interest is the role of self-efficacy judgment in inducing or deterring certain behaviours. This factor has been researched along with other factors in the IS / IT domain to explain individuals’ acceptance or adoption of various technologies.

Compeau and Higgins (1995) carried out to develop and validate a measure of computer self-efficacy and to assess both its impact and antecedents. He explained three distinct but interrelated dimensions of self-efficacy: magnitude, strength, and generalizability. The magnitude of self-efficacy refers to the level of task one believes oneself able to obtain and the higher the magnitude the more complex tasks one would expect to accomplish. Self-efficacy strength refers to the level of conviction about one’s judgment of his/ her efficacy as well as his/her resistance to disconfirmation. Frustrated individuals will lower their sense of efficacy while those with a higher sense of efficacy will not be deterred by difficult problems and will overcome whatever obstacles are presented. Generalizability of self-efficacy indicates the extent to which perceptions of self-efficacy are limited to particular situations. They defined computer self-efficacy as the judgment one has of his/her capability to use the computer, in a sense to apply the dimensions as follows: - Magnitude can be interpreted to reflect the level of capability
expected. Individuals with high magnitude self-efficacy might perceive themselves as able to accomplish difficult computing tasks with less support and assistance than those with lower judgments of self-efficacy.

- Strength of computing self-efficacy refers to the level of conviction about the judgment or the confidence one has in one’s ability to perform various computing tasks. Of course, individuals with high computer self-efficacy perceive themselves as able to accomplish more difficult tasks and display greater confidence in performing them.

- Generalizability refers to the degree to which the judgment about computing self efficacy is limited to a particular domain of activity such as different hardware or software configurations. Thus, individuals with high computer self-efficacy generalizability would expect to be able to use different packages and different systems while those with low computer self-efficacy generalizability would perceive their capabilities to be limited to a particular software package or computer system.

![Diagram of SCT Modeling Behaviour]

**Fig.3.5: The SCT Modeling Behaviour Source: Compeau & Higgins (1995)**

### 3.7 Institutional Theory (IST)

The institutional theory sheds light onto the importance of institutional environments to attitudes and behaviours of social actors. The theory argues that in modern societies, social actors are typified as systems of rationally ordered rules and behaviours.

1. The institutional theory posits that social actors face pressures to conform to these shared notions of appropriate structures, attitudes, and behaviours, which
suggests that social actors are subject to pressures to be compatible with the shared notions.

(2) DiMaggio, Powell and Scott suggested three institutional pressures—coercive, normative and mimetic. These three elements move ‘from the conscious to the unconscious, from the legally enforced to the taken for granted’

*Coercive pressures* are defined as formal or informal pressures exerted on social actors to adopt the same attitudes, behaviours and practices, because they feel pressured to do so by more powerful actors. Previous Empirical evidence suggests that, at the organisational level, coercive pressures may stem from a variety of sources, like resource dominant organisations (e.g., suppliers, customers), regulatory bodies and Parent Corporation. In general, there are two types of coercive pressures—competition and regulation. Competitive pressure arises from the threat of losing competitive advantage. Regulatory pressure may rise from government agencies and professional regulatory bodies. The literature has cited the influence of coercive pressures on innovation acceptance.

Wang and Cheung found that coercive pressure was positively related to travel agencies’ adoption of e-business.

Zhu *et al.* indicated that the regulatory environment plays an important role in e-business diffusion. At the individual level, it seems unlikely that there are coercive pressures from regulatory bodies and resource-dominant organisations identified at the organisational level. However, at the individual level, Internet Banking individuals may still face coercive pressures from other sources. For example, to use such financial services such as mortgage, loan and retirement account management, banks may require users to embrace IB. Employees may be required to use IB for payroll checks.

*Normative pressures* occur when social actors voluntarily, but unconsciously, copy other actors’ same attitudes, behaviours and practices. The institutional theory suggests that social actors are more likely to imitate a certain action if that action has been taken by a large number of other actors. Social actors are then compelled to adopt certain behaviour due to their desire for legitimacy and not necessarily for suitability. However, this imitation or copying is not coerced by any powerful actors, neither is it conscious. On the contrary, attitudes, behaviours and practices demonstrated for a long time by most actors in the same
social context become so legitimized as the ‘right’ way things are done that individuals often come to believe that these practices and behaviours represent the ‘only’ way to do things. The normative pressures may lead social actors who have not adopted the innovation to experience dissonance and hence discomfort when peers whose approval they value have adopted the innovation.

Granovetter and Krassa suggest that decisions to engage in a particular behaviour depend on the sheer number of similar others in the environment that have already done likewise. In the context of IB, normative pressures suggest that individuals will be more likely to adopt IB if they perceive that a large number of other individuals in their social network have already adopted IB. In many cases, individuals may be afraid that they will be deemed ‘old fashioned’ or ‘laid back’ if they do not follow the current trend.

*Mimetic pressures* force social actors to behave by seeking examples of established practices and behaviours to follow through voluntarily and consciously copying the same practices and behaviours of other successful and high-status actors. They mimic the course of action of such successful and high-status actors due to the belief that actions taken by successful actors will be more likely to yield positive outcomes. In addition, through imitating the actions of other successful and high-status actors, actors can economise on search costs and minimise experimentation costs, and avoid risks inherent from being the first-movers.

In the Internet Banking, individuals may selectively imitate the attitudes and behaviours that have been adopted by higher-status individuals. Individuals may believe that they can acquire higher status or associate with higher status individuals by imitating attitudes and behaviours taken by elite groups and high-status individuals. Therefore, it suggests that individuals will be more likely to adopt IB if their social ties who they perceive as high-status have already adopted IB.
### Table 3.4: Determinants of Behaviour in Technology Acceptance

<table>
<thead>
<tr>
<th>Model</th>
<th>Determinants of Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM</td>
<td>Perceived Usefulness (PU)+Perceived ease of Use(PEOU)</td>
</tr>
<tr>
<td>TRA</td>
<td>Individuals’ perceptions+Attitudes towards the behaviour+Social influences</td>
</tr>
<tr>
<td>TPB</td>
<td>Attitude toward behaviour+subjective norms +perceived behavioural control</td>
</tr>
<tr>
<td>DOI</td>
<td>Innovation attributes+ innovators’ characteristics</td>
</tr>
<tr>
<td>SCT</td>
<td>Self-efficacy +outcome expectations affect(Venkatesh,1999)</td>
</tr>
<tr>
<td>IST</td>
<td>Institutional Forces+ Attitudes towards adoption</td>
</tr>
</tbody>
</table>

### 3.8 Research Model Development

Several studies focusing on adoption of internet banking services have their roots in Technology acceptance Model (Davis, 1989). TAM model has become the most widely applied model of user acceptance and usage (Ma et. al, 2004). The banking system has been attempting to gather more and more information on aspects that induce people to do their banking over the Internet (Gerrard and Cunningham, 2003; Sathye, 1999). The adoption of internet banking by customers is being extensively investigated by several authors (Sayar and Wolfe, 2007; Eriksson, Kerem and Nilsson, 2005; Jaruwachirathanakul and Fink, 2005; Gerrard and Cunningham, 2003; Wang et al., 2003; Mukherjee and Nath, 2003).

In the following sections prior studies using TAM, TRA, TPB, DOI, SCT and IST Theory in the adoption of technology and Internet banking services context are used to develop the following research models. The first model takes the original TAM and attempts to include additional factors that have been empirically tested and found to influence on intention in order to enhance the prediction capabilities of TAM. The second research model is based on the DOI approach proposed by Moore and Benbasat and adapted to the Internet Banking context. The third research model takes into consideration of social cognitric facts in the attitude formation towards Internet banking.
3.8.1 First Research Model

Among the different models that have been proposed for the adoption and usage of relatively simple information system/technology, the technology acceptance model (TAM) (Davis, 1989; Davis et al., 1989) adapted from the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980), appears to be the most widely accepted one.

According to the TAM, adoption behavior is determined by the intention to use a particular system, which in turn is determined by the perceived usefulness and perceived ease of use of the system. As Davis (1989) suggested, future technology acceptance research must look for other variables that influence perceived usefulness and perceived ease of use and user acceptance.

The current study proposes the application of the technology acceptance model (TAM) to capture factors which have significant impact on the acceptance of Internet banking.

Several studies (Agarwal & Prasad, 1997; Venkatesh & Davis, 2000; Venkatesh & Morris, 2000) have attempted to extend TAM with different variables and had observed that addition of such variables increases the prediction of systems usage.

Factors affecting consumer acceptance and adoption of Internet banking have been investigated in many countries such as the US (e.g. Lassar et al., 2005; Kolodinsky et al., 2004), Europe (Littler and Melanthiou, 2006; Pikkarainen et al, 2004; Howcroft et al., 2002; Karjaluoto et al., 2002; Daniel, 1999), Australasia (e.g. Lichtenstein and Williamson, 2006; Sathye 1999), and Asia (see Yiu et al., 2007; Chan and Lu, 2004; Suh and Han, 2002).

Although previously researchers have investigated and replicated the TAM and agreed that it is valid in predicting the individual’s acceptance, the TAM’s fundamental constructs does not fully reflect the specific influences of technological and usage-context factors that may alter the users’ acceptance (Moon and Kim, 2001). Therefore, in the current study incorporated two new constructs (preserved web security and Risk and customer attitude) to enhance the understanding of an individual’s acceptance behavior of electronic banking.
A wide range of research over the past decade provides evidence of the significant effect of perceived ease of use on usage intention in a way or other through its effect on perceived usefulness (Davis et al., 1989; Venkatesh and Morris, 2000; Venkatesh et al., 2003). Moreover, extensive research in information system context provides evidence of the significant effect of perceived usefulness on attitude towards usage (Davis et al., 1989; Jackson et al., 1997; Venkatesh and Morris, 2000; Venkatesh et al., 2003). Finally, attitude towards usage is found to impact the intention to use Internet banking context (Tan and Thoen, 2000).

TAM has been the instrument in many empirical studies and it has been found that its ability to explain attitude towards using an information system is better than TRA and TPB (Mathieson, 1991). King and He (2006) conducted a statistical meta-analysis of TAM as applied in various fields using 88 published studies and the results showed TAM to be a powerful, highly reliable, valid and robust predictive model that may be used in a variety of contexts. Many researchers have suggested that external variables may be added to TAM as a way of improving the model’s predictive power (AlSukkar, 2005; Davis et al., 1989; Davis, 1993). In particular, AlSukkar (2005) proposed an extended TAM framework to model behavioural intentions in developing countries so that it may have greater applicability.

Considering the importance of the construct perceived behavioural control of TPB in explaining Internet Banking usage as expressed in prior studies, the current study proposes to extend TAM by adding an internal control factor, perceived self efficacy (Luarn & Lin, 2004). Further perceived Perceived Web security and risk is added to the model since it is widely recognized obstacle to the adoption of internet related application in prior studies. The security and risk issues are found to be significant concern for users while conducting transaction over internet.

3.8.2 Perceived Usefulness (PU)

The importance of perceived usefulness has been widely recognized in the field of internet banking (Guriting and Ndubisi, 2006, Jaruwachirathanakul and Fink, 2005; Eriksson, Kerem, and Nilsson, 2005; Laforet and Li, 2005; Polatoglu and Ekin, 2001; Liao and Cheung, 2002). According to them usefulness is the subjective probability that the technology can improve the way a user completes a given task. Based on theories in social
psychology, such as the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and the theory of planned behavior (TPB) (Ajzen, 1985), the technology acceptance model (TAM) has been validated as a powerful and parsimonious framework (Davis, 1989; Davis et al., 1989).

The PU is also an important variable from TAM (Araujo and Araujo, 2003; Noteberg et al. 2003; Gefen et al., 2003; Matheison, 1991; Malhotra and Galleta, 1999). Perceived Usefulness has been confirmed as an important variable that influences user technology acceptance and therefore has received a great deal of attention from prior researchers. The importance of perceived usefulness has been widely recognized in the field of Internet banking (Guriting and Ndubisi, 2006; Jaruwachirathanakul and Fink, 2005; Eriksson et al., 2005; Laforet and Li, 2005; Polatoglu and Ekin, 2001; Liao and Cheung, 2002).

According to the TAM, perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance. According to Davis et al. (1992), perceived usefulness refers to consumers’ perceptions regarding the outcome of the experience. Davis (1993) defined perceived usefulness as the individual’s perception that using the new technology will enhance or improve her/his performance. Similarly, Mathwick et al., (2001) defined perceived usefulness as the extent to which a person deems a particular system to boost his or her job performance.

Pikkarainen et al. (2004) applied TAM in Finland and they found perceived usefulness as a determinant of actual behavior which encouraged the user of the twenty first century banking to use more innovative and user friendly self-service technologies that give them greater autonomy in performing banking transactions, in obtaining information on financial advices, and in purchasing other financial products.

Gerrard and Cunningham (2003) noted that the perceived usefulness depends on the banking services offered such as checking bank balances, applying for a loan, paying utility bills, transferring money abroad, and obtaining information on mutual funds.

There are extensive evidences proving the significance of effect of perceived usefulness on adaptation intention (Chen and Barnes, 2007; Guriting and Ndubisi, 2006; Jaruwachirathanakul and Fink, 2005; Eriksson et al., 2005; Hu et al., 1999; Venkatesh,
2000; Venkatesh and Davis, 1996; Venkatesh and Morris, 1996). Tan and Teo (2000) suggested that the perceived usefulness is an important factor in determining adaptation of innovations. As a consequence, the greater the perceived usefulness of using electronic banking services, the more likely that electronic banking will be adopted (Polatoglu and Ekin, 2001, Jaruwachirathanakul and Fink, 2005).

Previous literature demonstrated PU to have large effects on attitude and intentions of technology use (e.g. Davis, 1989; Davis et al., 1989; Lin and Lu, 2000; Gefen et al., 2003; Fusilier and Durlabhji, 2005). Recent IS acceptance studies reveal that the influence of PEOU on attitude and intentions remains speculative and suggest that PEOU operates mainly through PU (e.g. Gefen and Straub, 2000, Ha and Stoel, 2008).

Raman, et al.(2008), applied the perceived ease of use construct in the Internet banking context, banks should focus on Web site navigation and applicable functions to cater the needs of their users.

In the internet banking context, it is presumed that the level of usefulness that Internet banking offers over and above regular banking methods could affect intentions towards adoption and usage. For example, individuals who find it difficult to visit the bank would perceive the possibility of performing transaction at any time of the day from any location.

3.8.3 Perceived Ease of Use (PEOU)

According to TAM, the PEOU is one of the main variables influencing adoption of Internet banking technology (Araujo and Araujo, 2003, Noteberg et al. 2003, Gefen et al. 2003, Matheison, 1991, Malhotra and Galleta, 1999).

Perceived ease of use refers to the ability of consumers to experiment with a new innovation and evaluate its benefits easily. The drivers of growth in electronic banking are determined by the perceived ease of use which is a combination of convenience provided to those with easy internet access, the availability of secure, high standard electronic banking functionality, and the necessity of banking services.

Extensive research over the past decade provides evidence of the significant effect of perceived ease of use on usage intention, either directly or indirectly (Hernandez and
Recently, Chen and Barnes (2007) have empirically found that two technological aspects of the interface, namely perceived ease of use and perceived usefulness significantly affect customer adaptation intentions.

Prior studies have shown that while the direct access of perceived ease of use remain important over the time, the indirect effect of perceived ease of use become stronger (Venkatesh & Morris, 2000). In the Internet banking context it is presumed that the system must be easy to learn and use for potential adopters otherwise they might refrain from adopting or using of Internet Banking. The indirect effect of perceived ease of sue through perceived usefulness will be more significant for existing user of Internet banking services as experience with system increases.

Extensive research over the past decade provides evidence of the significant effect of perceived ease of use on usage intention, either directly or indirectly (Hernandez and Mazzon, 2007; Guriting and Ndubisi, 2006; Eriksson, Kerem, and Nilsson, 2005; Wang et al., 2003; Venkatesh, 2000; Venkatesh and Davis, 1996; Venkatesh and Morris, 2000).

3.8.4 Perceived Web Security and Risk (PWSK)

The role of perceived Web security and risk has been investigated widely in the banking arena in understanding consumers’ intention to bank online or not. Perceived risk has been conceptualized in different literature in different ways. Studies showed perceived risk is an important factor that influences online shopping (Doolin, Dillo, Thompson & Corner, 2005; Jarvenpaa & Todd, 1997; Stewart, 1999); still limited work has been carried to identify risk dimensions in this context.

Security and reliability of transactions over the internet is a burning issue and it is an important factor that customers consider before adopting Internet banking. Some customers avoid electronic banking as they perceive it as being easily susceptible to fraud. This perception can damage consumers’ confidence of the online system as a whole. According to a study conducted by Sathye (1999), 73% avoided the adoption online, banking because they are concerned about safety and security of transactions over the
internet. Moreover, Sathye (1999) found that consumers will not be ready to change from present familiar ways of banking to Internet banking unless their specific need is satisfied.

In Internet banking services, perceived risk may be associated with the financial product itself as well as with electronic delivery channel. Importance must be given to this attribute while examining consumers’ adoption behaviour (Harrison, 2000). Authors (Polatoglu & Ekin, 2001; Sathye, 1999; Tan & Teo, 2000) found that perceived risk is one of the major factors affecting user adoption of Internet banking.

Chan and Lu (2004) added that risk perception hinders adoption for potential customers more than for existing customers of Internet banking services.

Wong and Chan (2005) claimed that more experienced Internet users are likely to involve themselves in Internet Banking services than those less experienced, as adoption is affected by the perceived risks and familiarity with internet technology.

AlSukkar (2005) proposed an extended TAM framework to model behavioural intentions in developing countries so that it may have greater applicability.

According to Salisbury et al. (2001) perceived security is defined as , the extent to which one believes that the World Wide Web is secure for transmitting sensitive information. According to Salisbury et al. (2001), Perceived Web Security was found to favorably influence customers’ attitude to purchase on the WWW. Customers tend to increase purchases only if they perceive that their credit card and other sensitive information are safe. Therefore, Perceived Web Security is expected to have a positive relationship with customers’ attitude to use Internet banking.

From the literature review it is evident that many consumers believe that carrying out financial transactions over the web is risky. Their concerns are about the reliability of the Internet and related infrastructure, as well as the spatial and temporal separation among users and bank personnel.

Perceived Risk is associated with consumers uncertainty about decision outcomes and possible negative consequences associated with a particular choice (Dowling and Staelin, 1994). Featherman and Pavlous’ (2002) study, for example, integrates Perceived Risk Theory and Technology Acceptance Model (Davis et al., 19989) and identifies a
research model where perceived risk negatively influences intentions to adopt e-service. Risk perceptions can escalate because in Internet banking there is no personal face-to-face contact with added potential financial risk and perceived threats to privacy.

The issue of security and trust are important in services involving online banking transactions. The risk perception regarding internet banking may likely involve two concerns: whether the information transmitted via internet is safe and whether the internet merchants a trustworthy in handling sensitive customer information and managing their financial assets.

In the study of Singapore consumers, Gerrard and Cunningham (2003) found security concerns of internet banking high in both adopters and non-adopters. However, it has been found that risk perception associated with transaction security is negatively related to willingness to make internet purchase (Jarvenpaa et al., 1999; Neumann, 1999; Swaminathan et al., 1999).

Sathye (1999) found that security concerns were an obstacle to the adoption of internet banking among Australian consumers.

3.8.5 Perceived Self-efficacy

Self-efficacy refers to the level of confidence a person has on oneself. Some people may be very confident about themselves just because that is their nature, where as others who are competent in something and should feel confident about doing it, actually don’t. Previous experience, ability to learn and adopt new information, willingness to just try out new things probably influence individuals self-efficacy in many situations.

Perceived behavioral control refers to the factors that may impede the performance of the behavior. This definition encompasses two components. The first component is self-efficacy and is defined as an individual’s self-confidence in his or her ability to perform a behavior (Bandura 1977 1982). The second component is “facilitating conditions” and it reflects the availability of resources needed to engage in the behavior (Triandis 1979).

Hill et al. (1986) found that self-efficacy predicts intentions to use a wide range of technologically advanced products. Thus, an individual confident in having the skills in
using the computer and the Internet is more inclined to adopt Internet banking. This is because the individual is comfortable in using the innovation.

Chan and Lu (1999) report that subjective norms and computer self-efficacy have a significant effect on intentions to adopt Internet banking, whereas, perceived ease of use had only an indirect significant effect on intention to adopt Internet banking through perceived usefulness.

In Internet banking context, self-efficacy is treated as one’s confidence in having the knowledge and skill in using the computer and the Internet to carry out banking transaction over the internet. Luarn and Lin (2004) found that self-efficacy has a significant positive influence on behavioural intention to use mobile banking.

Based on the above literature review it is found that self-efficacy influences behavioural intention of internet banking adoption.

### 3.8.6 Customer attitude

Empirical studies related to diffusion of technological innovations have expanded the use of the TAM model to include attitudes as defined by the Theory of Reasoned Action (Davis et al., 1989; Jayawardhena and Foley, 2000; Karjaluoto et al., 2002). At first, Lancaster (1966) noted that attitude is the driver of consumer utility or attributes. Triandis (1979) described attitude as an individual’s positive or negative behavior towards innovation adaptation. Triandis further stated that attitude portrayed the perceptions of usefulness of electronic banking, adaptation features, bank electronic features, risk and privacy, and personal preferences. TAM suggests that attitude is based on the salient beliefs which a person has about the consequences of a given behavior and his or her evaluation of those consequences.

More specifically, Polatoglu and Ekin (2001) suggested that customer attitude is composed of one’s attribute beliefs about the object and perceived importance (weight) of that attribute in making the decision to adopt.

In the Internet banking context, consumers attitude is assorted in terms of perceptions regarding product information, form of payment, delivery terms, service offered, risk involved, privacy, security, personalization, visual appeal, navigation,
entertainment, and enjoyment. Understanding the determinants of consumers’ attitude, it is argued that this attitude has a strong, direct, and positive effect on consumers’ intentions to actually use the new technology or system (Hernandez and Mazzon, 2007; Eriksson et al., 2005; Jaruwachirathanakul and Fink, 2005; Bobbitt and Dabholkar, 2001). On this basis, the researchers expect that customer attitude affects the acceptance of internet banking.

3.8.7 Behavioral Intention to use

It is the course of action that intends to flow towards an objective. It is an anticipated outcome that is intended or that guides ones planned actions. It is a decision or wish to do something specific with determination. The intention is an important variable in the TPB (Mathieson, 1991) and TAM (Araujo and Araujo, 2003; Noteberg et al., 2003; Gefen et al., 2003; Mathieson, 1991; Malhotra and Galleta, 1999).

TAM (Davis, 1989; Davis et al., 1989) model suggests that customer adaptation behavior is determined by the intention to use a particular system, which in turn is determined by the perceived usefulness and perceived ease of use of the system.

Liao and Cheung (2002) utilized an alternative research approach which assumes that customer adaptation is determined by intention to perform the behavior. However, factors affecting the adaptation of a new information technology are likely to vary with the technology, target users, and context (Moon and Kim, 2001).

In prior studies intention to use if found to be a predictor of actual use. Therefore, actual use has been used as a dependent variable in several studies (Agarwal & Prasad, 1997; Davis, 1989). In Internet banking context it is presumed that an individual with positive intention to adopt or use will use Internet banking services more frequently. In other words, positive intention will increase the number of times the services is being used within a period of time.
3.9 Second Research Model

Research model 2 uses extended DOI model proposed by Moore and Benbasat (1991). As noted earlier, this model replaced Rogers’ (1983) complexity factor with ease of use. In this model, we utilized concepts from DOI theory because it is well established and widely used in information systems (IS) diffusion related research (Prescott & Conger, 1995). We focus on individual’s perceptions about the characteristics of innovation to technologies based self-service mainly (Internet banking) as exploratory and predictive variables for user acceptance behaviour.

3.9.1 Relative Advantage

Relative advantage is defined as the degree to which an innovation is subjectively perceived as better than its alternatives methods available (Roger, 1995). Polatoglu and Ekin’s (2001) findings discussed relative advantage in terms of price, convenience and performance. Here for this work, the relative advantages of the banking based self-service via internet perceived to be better than interact and acquiring the services physically from bank branch.

With respect to Internet banking, consumers may perceive a relative advantage over branch banking in accessing accounts from any location and at any time of the day, and in
facilitating greater control and flexibility in managing their accounts. Several studies (Kolodinsky & Hogarth, 2001; Polatoglu & Ekin, 2001; Tan & Teo, 2000) on Internet banking have reported relative advantage as one of the key determinants that influences consumers’ adoption decisions.

Relative advantages could be measured in economic, social prestige, and convenience terms. Some adoption research, which has been conducted on the different self-service technologies used in banking, has cited economic benefits such as savings of time and money and convenience (Kolodinsky & Hogarth, 2001; Suganthi, et al, 2001; Lockett and Littler, 1997; and Polatoglu, & Ekin, 2001).

On other hand, researchers have cited and identified social prestige terms as relative advantages (e.g., Gerrard & Cunningham, 2003; Rogers, 1983). Widely, studies in the diffusion of innovation have used the convenience attribute as one of the characteristics of innovation. The evidence is drawn from the internet banking research done by Kolodinsky & Hogarth, (2001); Suganthi, et al, (2001); and Brown, et al. (2004) while, other utilized the satisfaction attribute of innovation such as Brown, et al. (2004).

The relative advantage variable are positively related to the adoption of innovation, in which the greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely to be. Dimensions of the construct of relative advantage according to Black, et al (2001)’s study have some generality including reduced costs and greater convenience. Moreover, savings of time and money have been cited much as relative advantages in several studies (e.g., Polatoglu, & Ekin, 2001; Suganthi, et al., 2001; and Al-Sabbagh & Molla, 2004). The innovation decision is made through a cost-benefit analysis where people will adopt an innovation if they believe that it will, overall, enhance their utility. The economic benefits have been found as good predictors of innovation’s relative advantages, which has been cited by several researchers (e.g., Kolodinsky & Hogarth, 2001; Black, et al., 2001; Polatoglu & Ekin, 2001 and Gerrard & Cunningham, 2003). For instance, cost is demonstrated as the most important reason for non-adoption of IB in the Singaporean market. Similarly, in Australia. Molla (2004) found relative advantage together with compatibility, and ease of use the most important factors affecting Internet banking adoption (intention to adopt).
3.9.2 Ease of Use

In studies based on DOI, complexity or ease of use is found to be an important factor affecting users’ intentions. In the context of Internet Banking, complexity has been measured in relation to several perceptions. Al-Sabbagh & Molla (2004); Brown, et al. (2004); Suganthi, et al. (2001); and Kolodinsky & Hogarth, (2001) have cited the user’s perception of difficulty of doing banking over Internet.

Subsequently, authors such as (Al-Sabbagh & Molla, 2004), in Omani context, Suganthi, et al. (2001), in Malaysian context and Kolodinsky and Hogarth 2001) Turkey context, exploited the (PEOU) to predict extend of simplicity or vice versa (complexity) of particular innovation tested.

Suganthi, et al (2001) empirically considered user’s perception on the ease of performing Internet banking transactions and ease of navigation the banks site to be pertinent factors that affect the adoption of Internet Banking. Moreover, Suganthi, et al (2001) employed two other dimension of complexity, which are accessibility and reluctance. With respect to accessibility and in the context of IB, Chau and Lai (2003) described the accessibility as the physical accessibility of Internet connections, and the global accessibility of nature of Internet banking round-the-clock. Accessibility by Chau and Lai (2003) found to be a significant factor influences the intention to adopt Internet Banking over influencing the perceived ease of use. Thus, if a user finds Internet Banking services difficult to access, he or she might be very frustrated and would therefore form a negative perception on Internet banking as complex services.

Similarly, Kolodinsky and Hogarth (2001) have demonstrated difficulty of use and fix errors as a form of complexity that significantly influenced e-banking adoption. Polatoglu and Ekin (2001) reported that no more complexity in Internet Banking with well-educated people, who are familiar to use Internet and e-mail.

Black, et al. (2001) found that complexity in conducting financial transactions over the Internet inversely related to a user's experience of computers. Similarly, in this research, we are expecting complexity variable to predict Internet Banking adoption applicable to Yemeni context and Yemenis banking users.

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3.9.3 Compatibility

Agarwal & Prasad (1998), Tornatzky & Klein (1982), focused on individuals are more likely to adopt the innovation when they feel they are compatible with the innovation. In the internet banking context, compatibility can be viewed as how well does the service fit with the way consumers manage their finances and how does it suit their lifestyle.

Studies Agarwal & Prasad (1997), Kolodinsky & Hogarth (2001) and Tan & Teo (2000), research on e-commerce and Internet banking have found positive influence of compatibility on intention to adopt. It is expected that people perceive Internet banking services more compatible to their lifestyle, they will more likely to adopt (Tan & Teo, 2000).

In the context of internet banking, Brown, et al. (2004) looked into to what extend using Internet Banking fits with working style, with the way preferred to manage finances affairs and lifestyle among the two contexts. In term of using compatibility as a measure of the values or beliefs of consumers, the ideas they have adopted in the past, and the ability of an innovation to meet their needs. Internet experience according to Brown, et al. (2004) showed a greater influence on adoption in Singapore than South Africa. As well as, Black et al. (2001) conclude that past experiences and the values of consumers in the British context appear to have a significant impact on their intention to adopt Internet Banking.

On the other hand, reviewing the Turkey context derived from Polatoglu and Ekin (2001) findings shown that respondents viewed Internet banking as being incompatible due to respondents’ preference for using traditional banking channel at bank branches and low levels of e-mail usage. Therefore, lack of compatibility may be a factor hindering the adoption of Internet banking Polatoglu and Ekin (2001) and it could be applicable that those who indicated they were comfortable with the Internet were more positive about Internet banking.

A study on factors underlying attitude formation towards online banking in Finland done by Karjaluoto, et al. (2002) demonstrated that four factors: prior computer experience, prior technology experience, personal banking experience, and reference group influence, affect attitude towards online banking as well as online banking usage. Thus, a better understanding of innovation allows the consumer to better appreciate the benefit brought by new innovation improvements and compatibility.

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3.9.4 Trialibility

Customers should try internet banking services before actually adopting the internet banking for their financial transactions. Before adoption the new innovation in financial services distribution they should try and think for the adoption will influence to have positive attitude towards the adoption of internet banking. Customer will test the product as trial then will adopt. If the trial product brings confidence then it will have a positive attitude towards adoption for internet banking. It will bring a positive attitude among those who are worried or have different anxiety toward adoption for the internet banking.

Brown (2004), pointed out and extended the definition given by Roger’s and elaborated users would like to have an opportunity to trial or experiment with the techno innovation prior to adoption or usage of innovation. From the internet banking perspective, customers will have a positive attitude to trial the product then will go for the adoption of the internet banking.

Brown, et al. (2004), Polatoglu, & Ekin (2001), and Kolodinsky & Hogarth (2001) had viewed the trail ability as positive attitude towards the adoption of innovation. Brown, et al. (2004), in his study focused, customers demand to be able to use Internet Banking services on a trial basis first at least for a month found a major influence on Internet banking adoption in South Africa and in Singapore.

Al-Sabbagh & Molla (2004) who emphasis on influence of user group for enabling customer’s towards the adoption of internet banking services. Their findings shows that, adopter’s group of the Internet Banking was much concern on how they influenced by their colleagues to use Internet banking rather than group who intend to use. Gerrard and Cunningham (2003), banks are responsible on how they can shift the perceptions of customers relating to the characteristics of internet banking which viewed in a negative or neutral way, thereby enabling Internet Banking to be viewed more favourably.

3.9.5 Observability

Moore and Benbasat (1991), argued that potential customer’s simple experience to internet banking or different objects will make a customer capable of making a positive attitude towards the adoption. They pointed customers exposure will influence the customer’s attitude towards the adoption of technology based financial services. Polatoglu and Ekin (2001), found if consumers observe the positive effects of adoption, success of adoption is more. Black, et al. (2001), study on adoption of internet financial services had found using internet for financial transactions appears to have less associated social esteem
so consumers by observing this will have a less inclination towards adoption. So they concluded that observation in his study had a contribution whether consumer will adopt or not. Again it can be concluded that if customers who are using internet banking will not show the result to third party then how other customers will observe and adopt internet banking. Chan and Ming-te (2004), have pointed out, Internet Banking usage is less observable like other IT innovations because banking and financial services transaction are very sensitive issue and requires a lot of security and also protection of customers privacy. Customers will hesitate to do internet banking transaction as it will be observed by others. Customers will feel to adopt internet banking in a secure environment. It will have a positive or negative perception regarding the adoption of internet banking through observability.

![Fig 3.7 Research Model-2 (Modified DOI) Model](image)

3.10 Research Model – 3

3.10.1 Impulse Tendency and Anxiety

According to Kacen and Lee (2002) and Rook and Fisher (1995), the general trait of impulsiveness has been extensively studied in clinical and developmental psychologists, education researchers, and criminologists. Impulsiveness is characterized by unreflective actions (Eysenck et al., 1985), and is significantly correlated with thrill-seeking (Weun et al., 1998), as well as the psychological need to maintain a relatively high level of stimulation (Gerbing et al., 1987; Kacen and Lee, 2002).

According to Puri (1996), the accessibility of the costs versus the benefits of impulsiveness influences whether consumers behave in an impulsive or a controlled manner. Whether or not an individual focuses on the costs or the benefits of impulsiveness may also depend on an individual’s basic values. Impulsiveness is a consumer’s tendency to transact spontaneously, unreflectively, and immediately. Highly impulsive consumer’s
are more likely to experience spontaneous transact stimuli; their transaction lists are more “open” and receptive to sudden, unexpected transaction ideas. Furthermore, their thinking is likely to be relatively unreflective, prompted by the physical proximity to a desired services, dominated by an emotional attraction to it, and absorbed by the promise of immediate gratification. Technologies such as the Internet expand consumers’ impulse transacting opportunities, increasing both the accessibility to products and services and the ease with which impulse transactions can be made. The impulse transacting tendency is defined as the “degree to which an individual is likely to make unintended, immediate, and unreflective transactions (i.e., impulse transaction). - anxiety: the degree of anxious or emotional reactions associated with the use of a particular system.

Venkatesh et al. (2003) published the results of a study that developed and validated a new research model with seven constructs: performance expectancy, effort expectancy, attitude toward using technology, social influence, facilitating conditions, self-efficacy, and anxiety, which are hypothesized to be fundamental determinants of the user behavioral intention of information technology.

Anxiety is also a factor as considered in different research towards different objects, so this study also tried to find out the impact of anxiety towards the attitude which may lead to the actual use of internet banking. Some characteristics in internet banking website enable consumers to go through the transacting stages very quickly. Internet banking provide 24X7 services all year round, consumers can search for information and do any transaction at any time. The virtual banking is reachable for customers who can browse internet banking at home and save on transportation time. Thus, impulsive consumers may show a more positive attitude toward internet banking than rational consumers.

![Research Model-3](image)

**Fig. 3.8 Research Model-3**

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Fig. 3.9 Proposed Conceptual Model

**Note:**
1. Perceived usefulness, perceived ease of use adopted from modified TAM (Pikkarainen et al., 2004).
2. Attitude towards using system is adopted from decomposed TPB.
3. Relative advantage, compatibility, trialability, observability and Image adopted from DOI.
4. Coercive and Normative forces adopted from IST.

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