

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The focus of the current study is twofold: one is to understand the impact of consumer adoption of mobile banking, the second is to identify the service quality dimensions of internet banking and measure the customer satisfaction of internet banking services in India. Internet banking and mobile banking are innovations involving both an intangible and an innovative medium of services employing high technology. These service channels are technology-based banking services available to the consumers. From this perspective, it is important to review two areas of literature. One is the technology adoption literature, and the other is the e-service quality literature. The first part of this literature review begins with the term consumer behavior, adoption process, basic knowledge of services, and then proceeds with service quality literature, e-service quality literature, and previous studies on e-service quality of internet banking. The second part begins with the underpinning models used in understanding the adoption of various technologies, and it also reviewed the prior studies on mobile banking adoption. The gaps identified from the literature review have used to develop the research objectives and the theoretical framework.

2.2 Consumer Behavior in General

Consumer behavior emerged as a distinct field of study during the 1960s, and is characterized by two broad paradigms: the positivist and the non-positivist. The positivist paradigm covers the economic, behavioral, cognitive, motivational/trait/attitudinal, and situational perspectives. The non-positivist paradigm laid out the importance of symbolic and subjective experience. The consumers' construct meaning is based on unique and shared cultural experiences, and thus there can be no single unified world view.

Kotler and Keller (2009) defined consumer behavior as “the study of how individuals, groups, and organizations select, buy, use, and dispose of goods, services, ideas, or experience to satisfy their needs and wants”. The buying behavior of a consumer depends on various factors such as culture, social factors, and personal characteristics. The term

consumer behavior is defined as “the behavior that consumers display in searching for, purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs” (Schiffman & Kanuk, 2004). Two kinds of consuming entities described in consumer behavior: the personal consumer and the organizational consumer. The personal consumers are referred to as *end users* or *ultimate consumers* who buy goods and services for individual consumption, for the use of the household, or as a gift for a friend. Organizational consumers buy products, equipments, and services in order to run their organization. The focus of this study is on the individual consumer or end user whose perception towards using mobile banking.

2.2.1 Consumer Adoption Process of Technology

Consumer decision-making process to buy a product or a service goes through a set of processes. These processes are explained by Kotler and Keller (2009) in five stages: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior. Consumer acceptance of new products and services are drawn from the area of research known as the diffusion of innovation. The diffusion of innovation broadly consists of two processes: the diffusion process and the adoption process. The diffusion is a macro process concerned about the spread of an innovation from its source to the end user, whereas adoption is a micro process, that focuses on the different stages through which a consumer passes when deciding to accept or reject a new product or service. The adoption process involves many stages through which an individual consumer arriving at a conclusion to accept or reject a new product or service. The five major adoption stages are described as (1) awareness, (2) interest, (3) evaluation, (4) trial, and (5) adoption (or rejection) (Schiffman & Kanuk, 2004). There exist many enhancements to the traditional adoption process to suit the need for the different type of products or services.

2.3 Convergence of Technology and Services

2.3.1 Services

The growth of the service sector is tremendous in today’s competitive business environment and the number and diversity of service providers' increases rapidly. Many definitions of service are present in the service marketing literature. Gronroos (1990) defined service as “ a process consisting of a series of more or less intangible activities that normally, but not

necessarily always, take place in the interaction between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customers”. According to Zeithmal and Bitner (1996), service is defined as “deeds, processes, and performances”. Services that are different from physical goods possess several characteristics: heterogeneous, intangible, simultaneous in production, distribution, and consumption, core value created in buyer-seller relationships, and no transfer of ownership in service transactions (Zeithmal & Bitner, 1996; Gronroos, 2000). The role of the customer is more prominent in the service where the customers participate in the production of the service. Service encounters have been defined as the “moment of interaction between a customer and firm” (Bitner et al, 1994; Bitner et al, 2000) called as critical moments of truth during which customers make an impression about the service firm. These service encounters can take place face-to-face, over the phone, through the mail, the Internet, or even wireless.

2.3.2 Technology in Service Delivery

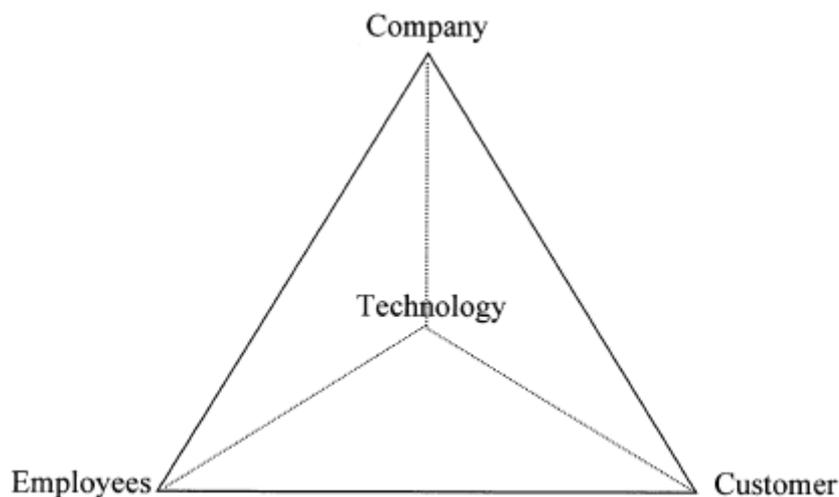
The impact of technology in the service delivery process attained much attention in the literature (Dabholkar et al, 1996; Bitner et al, 2000; Meuter et al, 2000; Parasuraman & Grewal, 2000). Today’s banking sector is largely driven by technology innovations and being characterized as a high-technology service sector. The advent of technology had replaced the traditional marketplace transactions to market-space transactions, defined as “a virtual realm where products and services exist as digital information and can be delivered through information-based channels” (Rayport & Sviokla, 1995 cited in Bitner et al, 2000). The use of technology allows reducing cost, reducing employee/customer interactions, and eliminating uncertainties.

A combination of technologies like computers, telecommunications, the Internet, and mobile phones can be used for a variety of service-delivery purposes, including customer service functions, transactions, and learning or information seeking (Meuter et al, 2000; Bitner et al, 2000; Bitner, 2001). The introduction of self-service technologies (SST) enables customers to produce a service independent of direct service employee involvement (Meuter et al, 2000; Dabholkar & Bagozzi, 2002). Examples of SSTs in the banking sector include ATM, Internet Banking, and Mobile Banking.

2.3.3 Service Pyramid model

To incorporate the changing environment in the service sector and the growing importance of technology, Parasuraman (1996) modified the service marketing triangle (Kotler, 1994) to form a pyramid by adding technology at the fourth endpoint called as the service pyramid model (see FIGURE 2.1). The base of the pyramid consists of three end points which are customer, employees, and the technology and this is the key interactive marketing components of the pyramid directly affecting service encounter satisfaction. The service encounter now can be seen as the dynamic relationship between employees, customers, and technology.

FIGURE 2.1: SERVICE PYRAMID MODEL (PARASURAMAN, 1996)



2.3.4 Classification of Technology-Based Service Delivery Options

The technology-based service delivery options are classified based on different criteria's (Dabholkar, 1994). The first classification depends on 'who' uses the technology to deliver 'what' services, whether it is a face-to-face service encounter or a technological interface. The second classification is based on 'location' where the service can be delivered and the location can be the service firm itself, or at the customers' home or office, or at a neutral place such as an ATM center. The final criterion is 'contact' with the technology in the service operation, whether direct or indirect like in the case of telephone banking. In the case of the internet and mobile banking, both are technology interface which can be used at customers' convenient places and customer can contact with the technology directly.

2.4 Service Quality

Measuring service quality is an exigent task for any service provider where the quality of the service offered plays a key role in the success of the business organization. Earlier, the service quality is defined and measured as product quality. Service quality is more difficult to evaluate than product quality due to the absence of tangible cues (Gronroos, 1982; Parasuraman et al, 1985). In the literature, there exist two types of conceptualization of service quality. The first one is “Nordic” perspective, which defines service quality as two dimensions: functional quality and technical quality (Gronroos, 1982, 1984). The second, the “American” perspective (Parasuraman et al, 1988) defines service quality consists of five dimensions (responsiveness, assurance, empathy, reliability, tangibles). The latter conceptualization dominated the service quality literature. Service quality is conceptualized by Parasuraman et al (1985, 1988) as the difference between the customer expectations and the actual performance of the service quality based on the gap theory (FIGURE 2.2).

The various gaps proposed in the model are:

Gap1: Difference between consumer expectations and management perceptions of those expectations, i.e. not knowing what the consumer expects.

Gap2: Difference between management perceptions of consumer expectations and the firm’s service quality specifications, i.e. knowledge of consumer expectations exists but improper service quality specifications.

Gap3: Difference between service quality specifications and actual service delivery, i.e. the service performance gap.

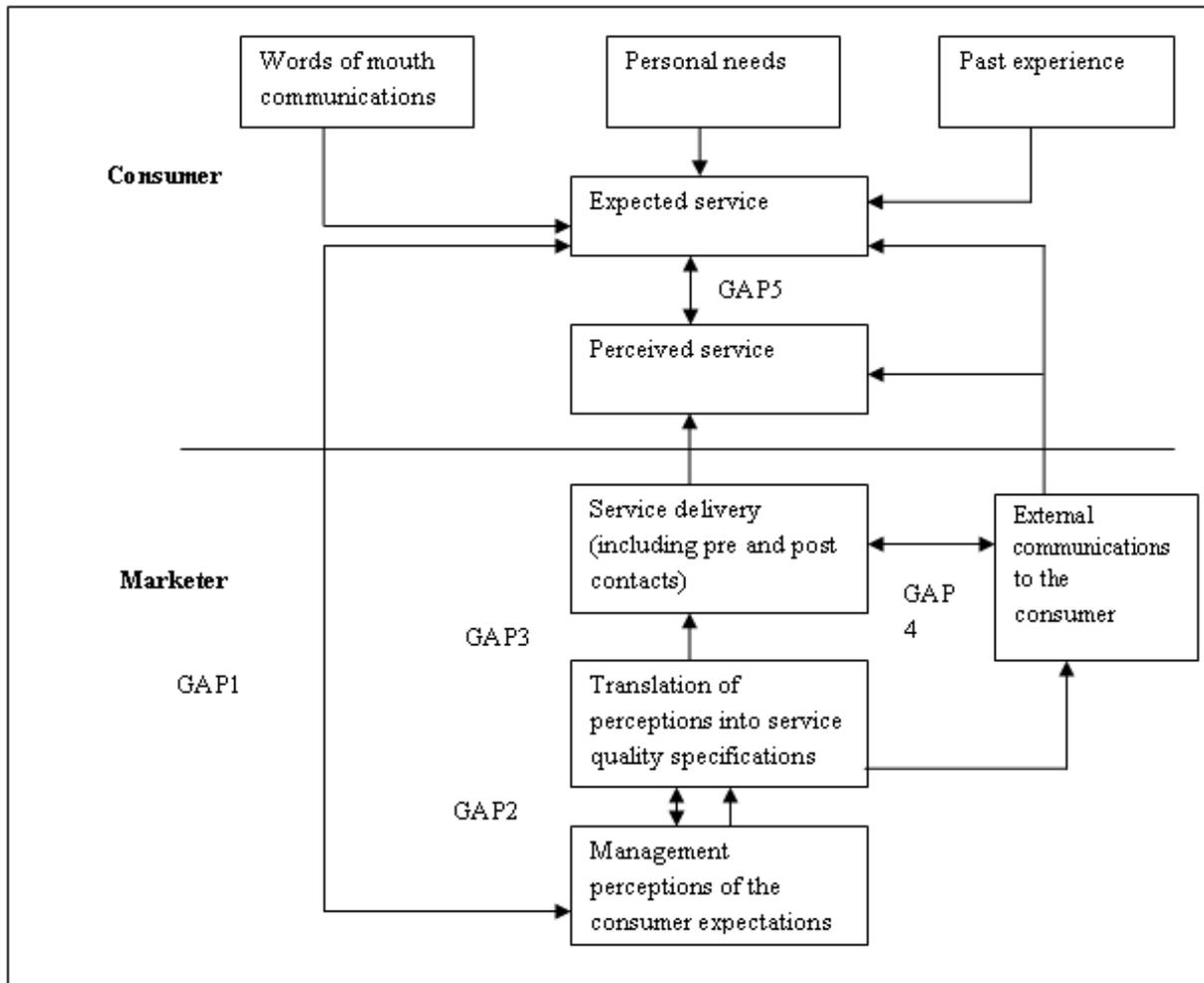
Gap4: Difference between actual service delivery and external communications about the particular service, i.e. differences between promises and service delivery.

Gap5: Difference between consumers’ expected service and perceived service. This gap depends on the size and direction of the four gaps associated with the service delivery on the marketers’ side.

The Gap model (Parasuraman et al, 1985) was further refined empirically named as SERVQUAL scale (Prasuraman et al, 1988) used to measure perceived service quality. The scale is initially comprised of ten dimensions proposed in the earlier study (Parasuraman et al, 1985) later collapsed to five dimensions. The scale consists of 22 items, which fall into

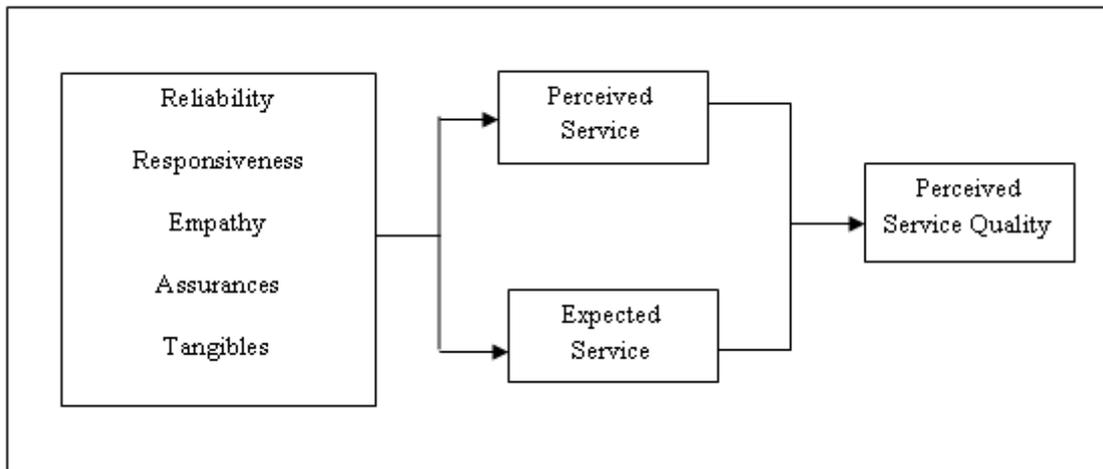
five dimensions; tangibles, reliability, responsiveness, empathy and assurance. There are total 44 items (22 items to measure expectations and 22 for perceptions) (FIGURE 2.3).

FIGURE 2.2: GAP MODEL (PARASURAMAN et al, 1985)



Several studies advanced modified versions of the SERVQUAL scale (Cronin & Taylor, 1992; Parasuraman et al, 1991, 1992; Zeithmal et al, 1996). These studies dropped the expected portions altogether (Cronin & Taylor, 1992).SERVQUAL is extensively used in various industries to assess the service quality of firms (Sureshchandar et al, 2002; Ladhari, 2009). Even though SERVQUAL is a widely accepted scale, it has raised some criticism from the scholars (Cronin & Taylor, 1994; Van Dyke, Kappelman & Prybutok, 1997).

FIGURE 2.3: THE SERVQUAL MODEL (PARASURAMAN et al, 1988)



SERVQUAL is the most accepted scales in the service quality literature. The major criticisms raised by this scale are its reliance on two scales measuring expectations and perceptions, the ambiguity of the expectation constructs, inconsistent factor structure, and the suitability of using a single scale to measure the service quality in different industries.

Another scale is the SERVPERF scale (Cronin & Taylor, 1992) which uses a single instrument that measures service quality performance. Cronin and Taylor (1992) developed SERVPERF scale which uses the performance-based measure of service quality. SERVPERF conceptualization is based on attitude model rather than the satisfaction paradigm. This scale is a performance-based measure consists of 22 items. This model concludes that perceptions only are the best predictor of service quality. Service quality is evaluated by perceptions by the formula

$$SQ = \sum_{j=1}^k P_{ij}$$

Where:

SQ = Overall service quality;

k = the number of attributes;

P_{ij} = performance perception of stimulus i with respect to attribute j.

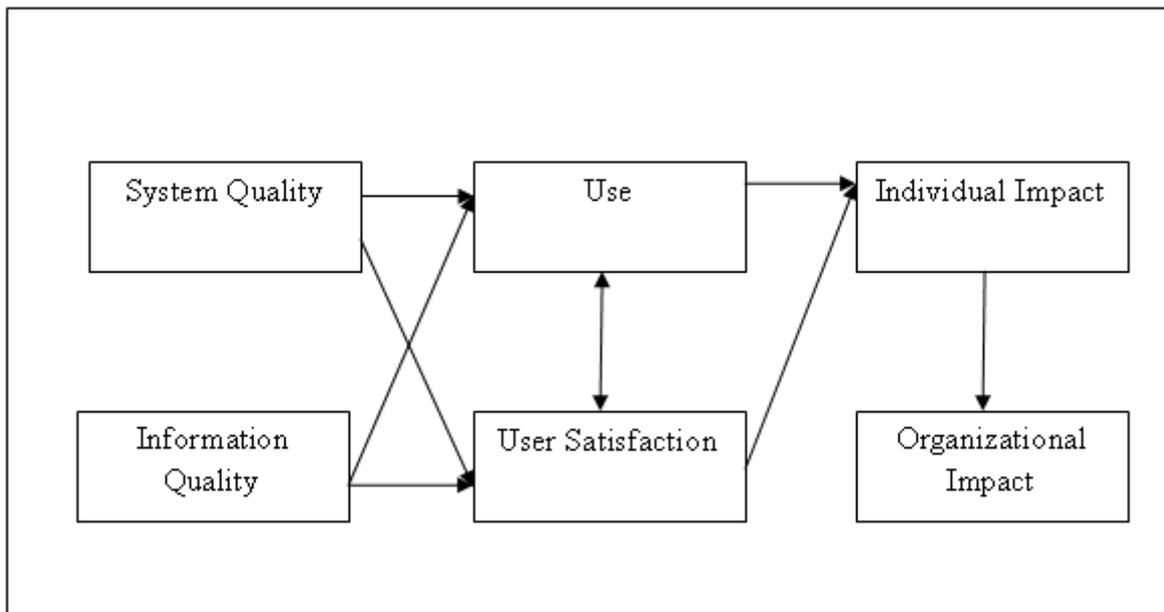
Many researchers have found service quality perceptions are multilevel and multidimensional (Daobolkar et al, 1996; Rust & Oliver, 1994; Brady & Cronin J., 2001). There are many service quality models present in the literature (see detailed review in Seth et al, 2005).

Even though, SERVQUAL and SERVPERF are the two major scales widely accepted in the literature, but there is no universal concord among researchers about the service quality scale.

2.5 Information Systems (IS) success Model

Internet banking and mobile banking are both an information system and technology-based self-services (e-service) provided to the customers. Both information systems (IS) and service qualities are two parallel research fields; to integrate them are necessary to get a holistic view to the acceptance of any new information system (Wixom & Todd, 2005). Meanwhile, many academic researchers have understood the role of technology for the delivery of services recently (Bitner et al, 2000; Dabholkar, 1996; Parasuraman & Grewal, 2000; Meuter et al; 2000; Al-Hawari et al, 2005), and the qualities of these services are related to both user satisfaction and the information systems (IS) success in the IS field (Yen & Lu, 2008).

FIGURE 2.4: THE ORIGINAL IS SUCCESS MODEL (DELONE & MCLEAN, 1992)

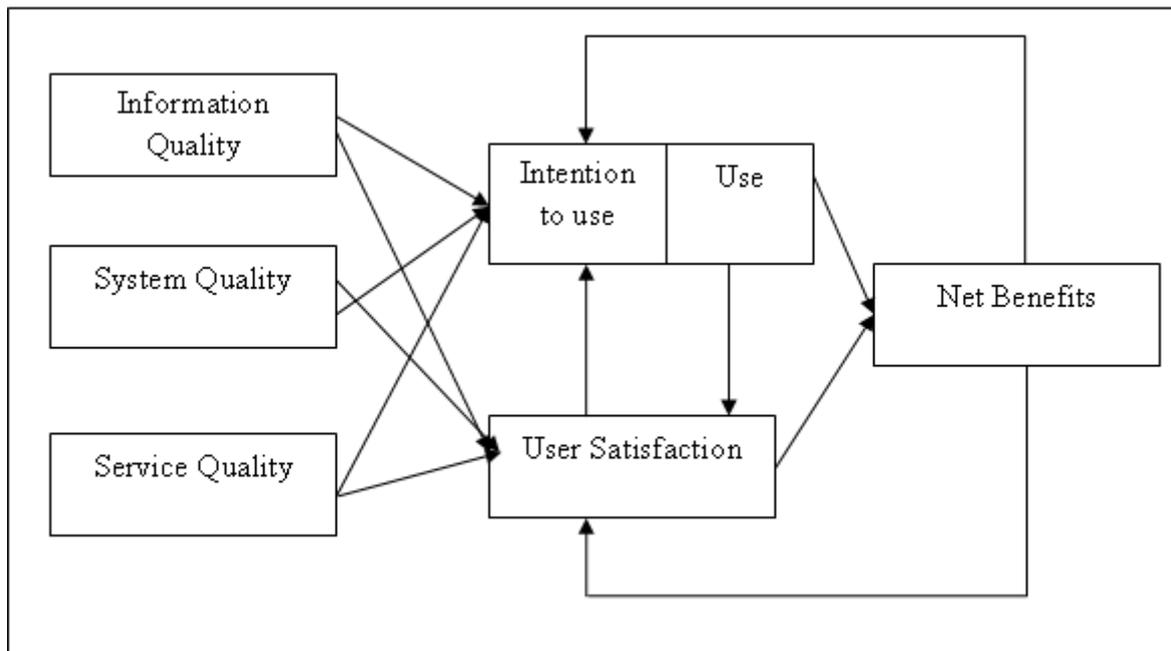


The Measurement of IS system success is the major research area in the IS field. Many researchers attempted to measure the success of information systems (Mason, 1978; Ives & Olson, 1984; Delone & McLean, 1992). Delone and McLean (1992) developed a model which has been widely accepted to measure the information system success. Their conceptual model (FIGURE 2.4) consists of six interdependent dimensions to IS successes, which are

system quality, information quality, use, user satisfaction, individual impact and organizational impact.

Several researchers have re-specified and empirically validated the IS success model (e.g. Seddon, 1997; Molla & Licker, 2001; Rai et al., 2002). Delone and McLean (2003) updated their initial model (Delone & McLean, 1992) to measure the e-commerce success (FIGURE 2.5).

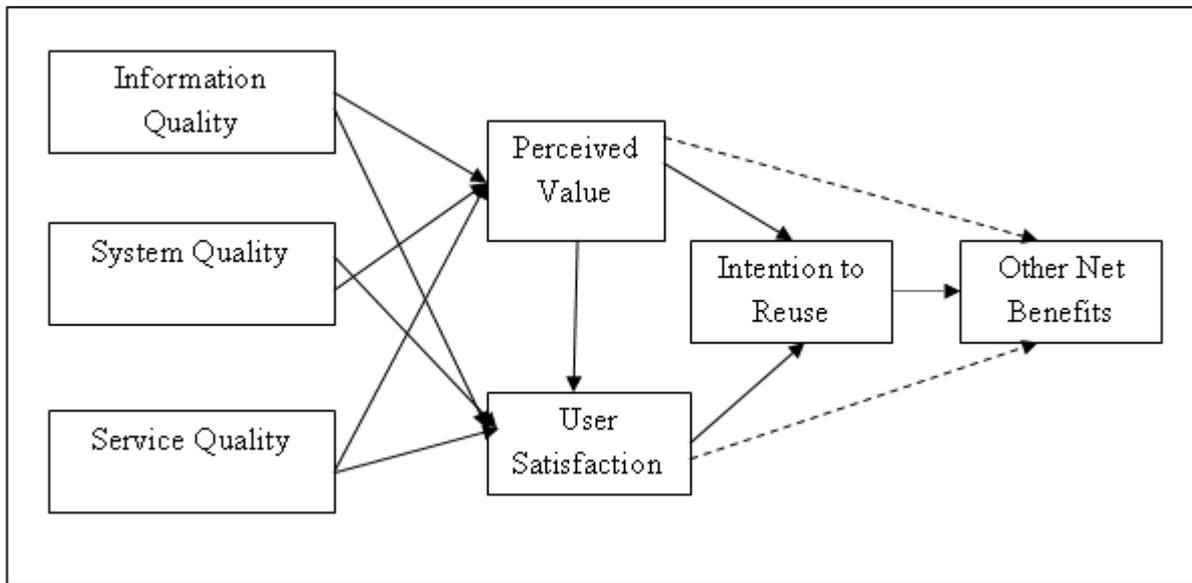
FIGURE 2.5: DELONE & MCLEAN'S (2003) UPDATED IS SUCCESS MODEL



The updated model (see FIGURE 2.5) consists of six interdependent constructs of IS success: System quality, information quality, service quality, use, user satisfaction and net benefits. The enhanced version added a new dimension called “service quality” and collapsing “individual impacts” and “organizational impacts” into a single construct called “net benefits”. Chen and Cheng (2009) modified the Delone & McLean (2003) model by separating ‘use’ into two distinct constructs: ‘intention to use’ and ‘actual use’ to apply in the online shopping websites.

FIGURE 2.6: THE RE-SPECIFIED E-COMMERCE SYSTEMS SUCCESS MODEL (WANG, 2008)

Note: The dashed paths have not been validated by this model.



Wang (2008) proposed and validated a research model based upon the work of Delone & MacLean (2003) and Seddon (1997) (FIGURE 2.6). The validated model (Wang, 2008) consists of six dimensions: information quality, system quality, service quality, perceived value, user satisfaction and intention to reuse. Wang (2008) re-specified the “Net benefits” constructs of the updated D&M model (Delone & McLean, 2003) and proposed a new construct called “Other Net Benefits” which represent IS impact or benefit measures. The constructs “perceived value” substitute for perceived usefulness, “user satisfaction” and “intention to reuse “substitute for system use/intend to use are all considered to be measures/surrogates of the “Net benefits” construct.

Delone and McLean’s (1992) IS success model and its extensions, proposed and validated by them and other researchers offer a framework, for measuring the IS success using multidimensional constructs having interrelationships among those dimensions.

2.6 E-Service

The rapid development of the Internet and communication technologies brings customers in the electronic marketplace. The terms e-business and e-commerce has been used interchangeably and can be defined as a variety of market transactions involving either physical or digital products that are enabled by information technology (Surjadaja et al,

2003). E-commerce is an electronic exchange of information or digital content, goods, services and payments between parties, which will result in monetary exchange (Chen, 2001). E-business does not end up always in monetary exchange. E-business can be defined as “the conducting of business (buying and selling, servicing customers, and collaborating with partners) through the Internet” (Chen, 2001 cited in Surjadjaja et al, 2003). E-business can be categorized into e-commerce and e-service (Surjadjaja et al, 2003). E-business, e-commerce, and e-service all has a distinct definition; however, they do overlap. Electronic service (e-service) is the key determinant of successful e-business. E-Service is defined as “deeds, efforts or performances whose delivery is mediated by information technology (including the web, information kiosks and mobile devices)” (Rowley, 2006). Another definition which broadly defines e-services as “services delivered via information and communication technology where the customer interacts solely with an appropriate user interface (i.e. ATM or website) in order to retrieve desired benefits” (Fassnacht & Koese, 2006).

E-service can be understood broadly as, services delivered electronically by using various information & communication technologies such as the Internet, mobile phones, and other handheld devices.

2.6.1 E-Service Quality

Service quality is indispensable for the success of an e-business. Electronic service quality has a key role to attract and maintain customers in the B2C e-commerce environment. Zeithmal et al (2002) defined e-service quality as “the extent to which a website facilitates efficient and effective shopping, purchasing and delivery of product and services”. Another definition of e-service quality provided by Fassnacht and Koese (2006) as “the degree to which an electronic service is able to effectively and efficiently fulfill relevant customer needs”. Gummerus et al (2004) defined e-service quality as “the consumer’s evaluation of process and outcome quality of the interaction with a service provider’s electronic channels”. (Santos, 2003) conceptualized the e-service quality as consumers overall assessment and judgment of the excellence and quality of e-services in the virtual environment.

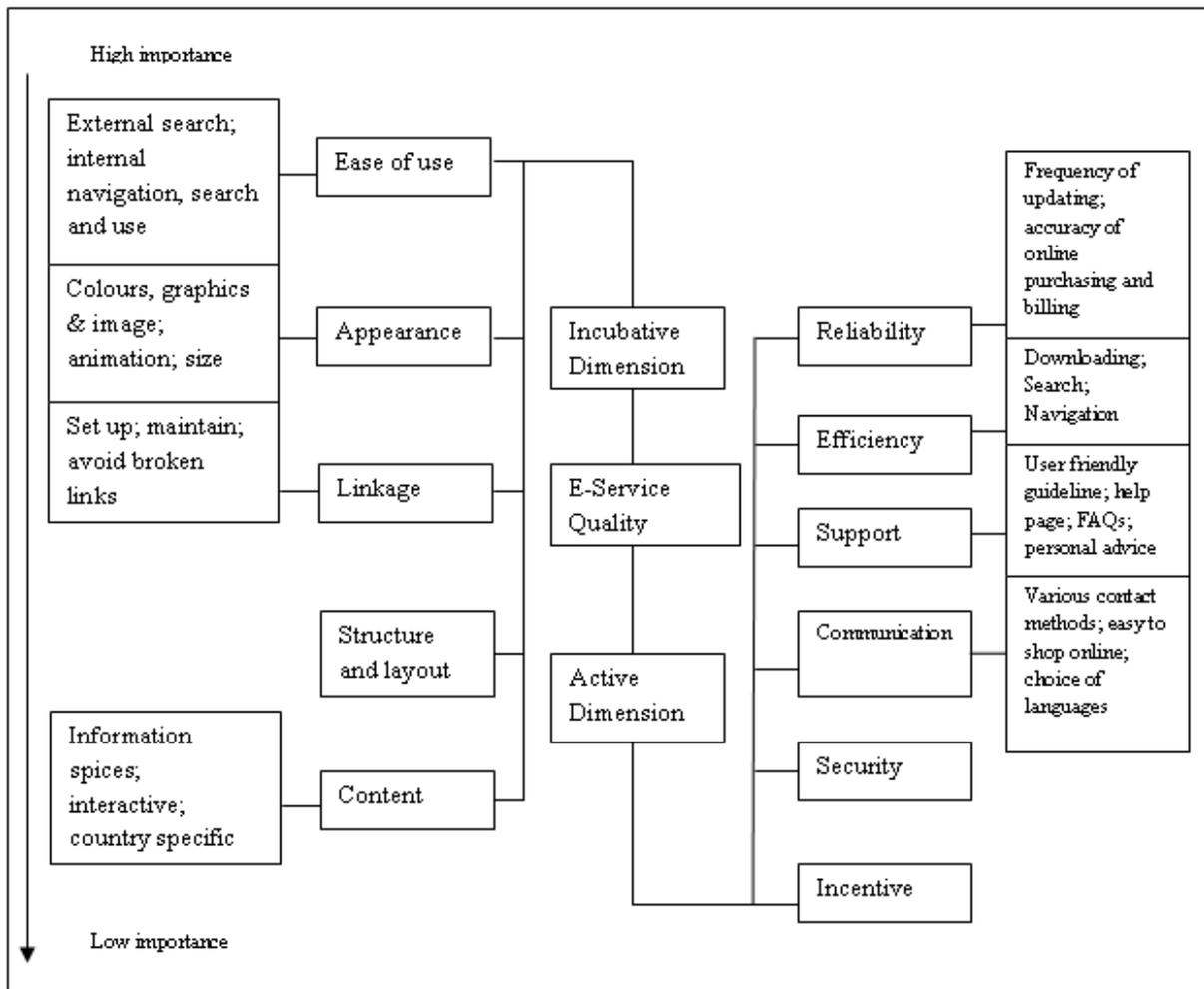
Santos (2003) proposed an e-service quality model (FIGURE 2.7) based on the exploratory study using focus groups, which identified incubative and active dimensions. The incubative dimension (Santos, 2003) is defined as “proper design of a website, how technology is used

to provide consumers with easy access, understanding and attractions of a web site”. These dimensions include: ease of use, appearance, linkage, structure and layout and content (Santos, 2003). Ease of use is defined as “how easy the website is for customers to conduct an external search in cyberspace and internal navigation and search within the website”. Appearance is defined as “the proper use of color, graphics, images, and animations together with the appropriate size of the web pages”. The linkage refers to “the number and quality of links that a website offers”. Structure and layout, refer to “the organization and presentation of a website’s content and information”. Content refers to “the presentation and layout of factual information and functions on a website”. The active dimension is defined as “the good support, fast speed, and attentive maintenance that a web site can provide it to its customers”.

These dimensions include: reliability, efficiency, support, communications, security, and incentives (Santos, 2003). Reliability refers to “the ability to perform the promised service accurately and consistently, including frequency of updating the website, prompt reply to customer inquiries, and accuracy of online purchasing and billing”. Efficiency refers to “the speed of downloading, search, and navigation”. Support defined as “the technical help, user guidelines, and personal advice available to customers from a website”. Communication is defined as “keeping customers properly informed and communicating with them in language they can understand”. Security refers to “freedom from danger, risk, doubt (including financial insecurity) during the service process”. Incentive refers to “the encouragement given by web providers to consumers to browse and use the web site, including rewards for doing so”.

Incubative dimensions deal with the technicalities of the website whereas active dimension deals with the quality of the services provided to the customer through the website.

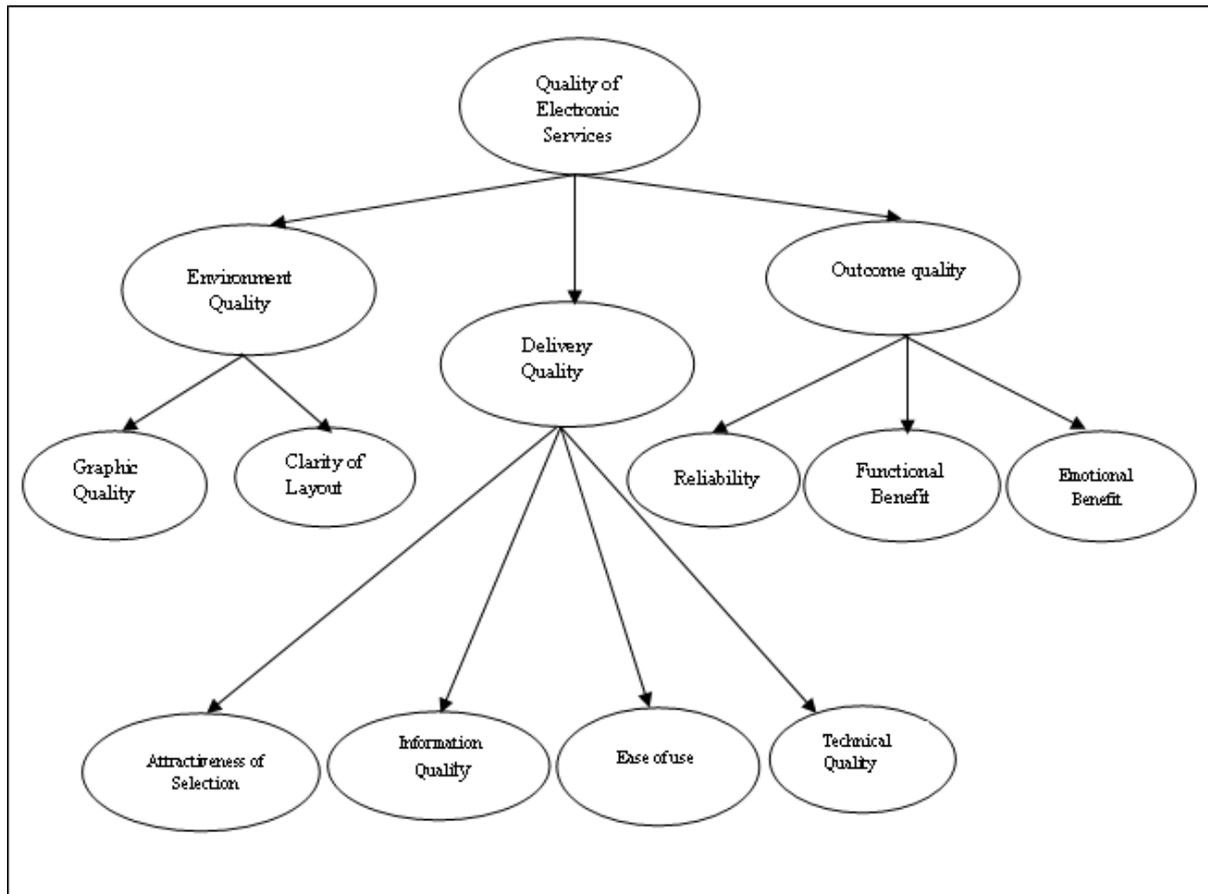
FIGURE 2.7: E-SERVICE QUALITY MODEL (SANTOS, 2003)



Fassnacht and Koese(2006) developed a hierarchical model for electronic service quality (FIGURE 2.8) which includes three dimensions as second-order factors and nine sub dimensions as first-order factors. The three dimensions include: environment quality, delivery quality and outcome quality (Fassnacht & Koese, 2006). Environment quality is related to the appearance of the user interface. The two sub dimensions associated with it include: Graphic quality and clarity of layout. Graphic quality measures how well the various elements of the user interface are visually represented. Clarity of layout is defined as “the degree to which the design structure of the user interface helps users to find their way” (Fassnacht & Koese, 2006).

Delivery quality pertains to the customer-website interaction during service usage. The sub dimensions related to Delivery quality include: attractiveness of selection, information quality, ease of use and technical quality (Fassnacht & Koese, 2006).

FIGURE 2.8: E-SERVICE QUALITY MODEL (FASSNACHT & KOESE, 2006)



Attractiveness of selection is defined as “the extent to which the available range of offerings appeals to the customer”. Information quality refers to the “extent to which complete, accurate, and timely information is provided to the customer during the interaction process with the user interface”. Ease of use is defined as “the degree to which the functionality of the user interface facilitates the customer’s retrieval of the electronic service”. Technical quality refers to “the goodness of data transfer and data processing during the delivery of the electronic service”. The third second-order dimension called as outcome quality referred as “what the customer is left with after service delivery”. The sub dimensions of output quality include: reliability, functional benefit and emotional benefit. Reliability refers to “the accuracy and timeliness with which the underlying service promise is fulfilled”. Functional benefit is defined as “the extent to which the service serves its actual purpose”. Emotional benefit is “the degree to which using the service arouses positive feelings”.

The e-service quality can be broadly understood as, the measurement of the efficiency and effectiveness of the services delivered through electronic channels. The e-service quality

models can be a multi-dimensional/hierarchical structure. However, the emphasis is on both technical quality of the interface and the service quality of the electronic delivery channels.

2.6.2 Studies related to E-Service

The conventional SERVQUAL scale was initially applied to the online environment to measure e-service quality, which has raised many criticisms (Van Riel et al., 2001; Barrutia & Gilsanz, 2009). The absence of personal interaction between the customers and the employees within the e-service firm is the main difference between the traditional service environment and the e-service environment. This leads to the development of e-service quality. The initial studies of e-service quality was more concentrated on the website quality rather than service quality in the online environment (Palmer, 2002; Webb & Webb, 2004; Kim et al., 2005; Lin, 2007). Yoo and Donthu (2001) developed a scale called SITEQUAL consists of four dimensions: ease of use, aesthetic design, processing speed and security. Barnes and Vidgen (2002) developed the WEBQual 4.0 scale consists of five dimensions: usability, design, information, trust, and empathy. Wolfinbarger and Gilly (2003) created a scale called eTailQ to measure customer perceptions of e-tailing quality consists of four dimensions: website design, reliability/fulfillment, privacy/security and customer service. Zeithmal et al (2002) developed an e-service quality scale consisting of five dimensions: Information availability, ease of use, privacy/security, graphics style and reliability. Parasuraman et al (2005) conceptualized and constructed a multiple-item scale consisting of seven dimensions for measuring the service quality delivered by web sites. These seven dimensions were subdivided into two scales consists of E-S-QUAL and E-RecS-QUAL. The E-S-QUAL (Parasuraman et al 2005) is a 22-item scale, four-dimensions: efficiency, system availability, fulfillment and privacy. The E-RecS-QUAL (Parasuraman et al 2005) is an eleven item scale of three dimensions: responsiveness, compensation and contact, focusing on handling service problems and inquiries. Loiacono et al (2007) created a WEBQualTM scale consists of twelve dimensions, namely informational fit to task, interactivity, trust, response time, design appeal, intuitiveness, visual appeal, innovativeness, flow (emotional appeal), integrated communication, business process, and substitutability.

Van Riel et al (2003) identified five e-service quality dimensions: user interface design, reliability, security, customization and responsiveness. Cristobal et al (2007) developed a scale, called Perceived e-Service Quality (PeSQ) composed of four dimensions: web design,

customer service, assurance, and order management. Bauer et al (2006) developed a scale; called eTransQual which integrated both utilitarian and hedonic e-service quality elements consist of five dimensions: functionality/design, enjoyment, process, reliability, and responsiveness. Swaid and Wigand (2009) identified six dimensions to measure e-service quality: information quality, website usability, reliability, responsiveness, assurance and personalization. Based on the work of Dabolkar et al (2000) and Fassnacht and Koese (2006), Carlson and O’Cass (2011) assessed alternate theoretical models of e-service quality viewed as dimensions, as antecedents to a global evaluation of e-service quality, or as a formative model to predict behavioral intentions and found empirical support for all three models, slightly stronger support for the formative model.

Yang and Jun (2002) measured e-service quality between Internet purchasers and non-purchasers and identified six dimensions perceived by Internet purchasers and seven dimensions perceived by Internet non-purchasers. The common factors perceived among both groups were reliability, access, ease of use, personalization and security. The credibility dimension was perceived only by Internet purchasers, and the distinguished dimensions of non-purchasers are responsiveness and availability. The determinants of retail service quality (Long & McMellon, 2004) were identified as tangibility, assurance, purchasing process, reliability and responsiveness. Another study of customer evaluation of e-service quality of online retailers (Ribbink et al, 2004) identified five dimensions, which were assurance, ease of use, e-scape, responsiveness and customization.

Yang et al (2004) developed a scale to measure online service quality, which includes six dimensions of 20 items, namely: reliability, responsiveness, and competence, ease of use, security, and product portfolio. Lee and Lin (2005) developed an instrument to measure e-service quality by modifying the SERVQUAL model in the online shopping context. The dimensions included were web site design, reliability, responsiveness, trust, and personalization (Lee & Lin, 2005). Kassim and Abdullah (2010) studied the relationship between perceived service quality, satisfaction, trust, and loyalty in e-commerce settings among the two cultures Malaysian and Qatari and found no significant difference between the effects of perceived service quality on satisfaction, satisfaction on loyalty, and trust and loyalty. Carlson and O’Cass (2010) empirically proved that e-service quality influences

consumer attitudes as well as consumer satisfaction and behavioral intentions in the context of content-driven websites.

The prior studies of e-service quality and its dimensions/scales identified are summarized in Table 2.1.

TABLE 2.1: REVIEW OF THE MAIN STUDIES ON E-SERVICE QUALITY

Authors(s)	Dimensions	Scale/Context
Yoo& Donthu(2001)	Ease of use, aesthetic design, processing speed and security.	SITEQUAL
Barnes& Vidgen(2002)	Usability, design, information, trust, and empathy.	WEBQual 4.0
Zeithmal et al (2002)	Information availability, ease of use, privacy/security, graphics style and reliability.	e-SQ
Yang & Jun (2002)	Reliability, access, ease of use, personalization, security, credibility, responsiveness and availability.	Online retailing
Santos (2003)	Incubative and active.	E-service quality
Wolfenbarger & Gilly(2003)	Website design, reliability/fulfillment, privacy/security and customer service.	eTailQ
Yang et al (2004)	Reliability, responsiveness, competence, ease of use, security, and product portfolio.	Online shopping sites
Long & McMellon (2004)	Tangibility, assurance, purchasing process, reliability and responsiveness.	Retail service quality on the internet.
Ribbink et al (2004)	Assurance, ease of use, e-scape, responsiveness and customization.	Online retailers
Parasuraman et al (2005)	Efficiency, system availability, fulfillment and privacy	E-S-QUAL
Lee & Lin (2005)	Web site design, reliability, responsiveness, trust, and personalization.	Online shopping

Authors(s)	Dimensions	Scale/Context
Parasuraman et al (2005)	Responsiveness, compensation and contact.	E-RecS-QUAL
Fassnacht & Koese (2006)	Graphic quality, layout, attractiveness of selection, information, ease of use, technical quality, reliability, functional benefit and emotional benefit.	E-service
Bauer et al (2006)	Responsiveness, reliability, process, functionality/design and enjoyment.	eTransQual
Cristobal et al (2007)	Web design, customer service, assurance, and order management.	PeSQ
Lin (2007)	Website design, interactivity, informativeness, security, responsiveness, empathy and trust.	Website quality
Loiacono et al (2007)	Informational fit to task, interactivity, trust, response time, design appeal, intuitiveness, visual appeal, innovativeness, flow(emotional appeal), integrated communication, business process, and substitutability.	WEBQualTM
Swaid & Wigand (2009)	Information quality, website usability, reliability, responsiveness, assurance and personalization.	Online retailers

Previous studies on e-service quality scales pointed out that there is no uniformity in measurement scales, and it is measured in different e-service contexts. There is no consensus of which dimensions accurately measure the e-service quality.

2.7 Internet Banking

Internet banking is one of the narrowly defined e-services in the virtual environment. Measuring the service quality of internet banking offered to Indian banking customers is one part of this research study. Internet banking has experienced tremendous growth and playing an important role in the banking sector, and therefore, has gained much attention in the

academic literature (Daniel, 1999; Jayawardhena & Foley, 2000; Ibrahim et al, 2006; Pikkarainen et al, 2006; Shamdasani et al, 2008; Wong et al, 2008). Internet banking services allow customers to carry out a wide range of banking operations at their convenient time and location. Daniel (1999) defined electronic banking as “the provision of information and /or services by banks to its customers via computer, telephone or television”. Using Internet banking, customers are allowed to conduct banking transactions electronically via the bank’s website.

2.7.1 Key Findings from the previous Internet banking E-service quality Studies

Internet banking transformed the traditional brick-mortar branching services. In the absence of geographical constraints or the lack of personal interaction between customers and bank employees, attracting and retaining customers largely depended upon the service quality of internet banking.

Joseph et al (1999) studied the service quality of internet banking and found six dimensions: convenience/accuracy, feedback/complaint management, efficiency, queue management, accessibility and customization.

Jun and Cai (2001) based on content analysis identified 17 dimensions of internet banking service quality. These dimensions were classified into three broad categories: customer service quality, banking service product quality, and online system quality. The customer service quality consists of 10 dimensions, which include: reliability, responsiveness, competence, courtesy, credibility, access, communication, understanding the customer, collaboration and continuous improvement. For online system quality, six dimensions observed, which include content, accuracy, ease of use, timeliness, aesthetics, and security. The banking service quality consists of one dimension called product variety/diverse features.

Jayawardhena (2004) measured the service quality of internet banking by transforming the original SERVQUAL scale within the Internet context. The measurement scale consists of 21 items underlying five dimensions, namely access, website interface, trust, attention and

credibility by exploratory (EFA) and confirmatory (CFA) factor analysis. This model explained 59 percent of the variance in overall service quality.

Han and Baek (2004) used the modified SERVQUAL instrument for online banking and from exploratory and confirmatory factor analysis identified a four-factor solution of online banking service quality. The dimensions found were tangibles, reliability, responsiveness and empathy.

Yang et al (2004) identified six key dimensions to online service quality. The study applied ethnographic content analysis to 848 customer reviews of online banking services followed by a web-based questionnaire. The confirmatory factor analysis (CFA) identified six dimensions: reliability, competence, responsiveness, ease of use, security, and product portfolio.

White and Ntli (2004) identified the service quality attributes perceived by a sample of UK internet banking customers. Using trade-off analysis, the key attributes identified were responsiveness of service delivery, credibility of the internet banking provider, security of the bank's website, ease of use of the bank's website, and product variety/diverse features.

Bauer et al (2005) studied the quality of e-banking portals in German e-bank portal users. The quality of the e-banking portal was measured using a 61 item scale and identified six dimensions: security and trust, basic services quality, cross-buying services quality, added value, transaction support and responsiveness. These dimensions were classified under three service categories: core services, additional services and problem-solving services.

Siu and Mou (2005) adapted the dimensions of e-SERVQUAL (Zeithmal et al,2000,2002) and examined customers' service quality perceptions in internet banking and the impact of these perceptions on customer satisfaction and future consumption intentions in Hong Kong. The study identified four dimensions: credibility, efficiency, problem handling, and security. All dimensions except security were found to be important in determining overall service quality perceptions. Credibility, problem handling and security had a significant impact on customer satisfaction, whereas security and efficiency were significantly associated with future consumption behavior.

Al-Hawari et al (2005) measured the automated service quality in banks and identified a five factor structure consisting of: ATM service quality, telephone banking service quality, internet banking service quality, core service quality and price quality. The internet banking service quality dimensions identified were, availability, easy to use, secure, error-free transactions, attractiveness, interface accuracy and information updating.

Ibrahim et al (2006) explored the key dimensions of electronic service quality perceptions of UK banking customers. The six factors identified were convenience/accuracy, accessibility / reliability, good queue management, personalization, friendly/responsive customer service, and targeted customer service.

Sohail and Shaikh(2008) analyzed the service quality of internet banking services provided by banks in Saudi Arabia. Their measurement scale consists of 27 items, which empirically identified three factors that influence user's evaluation of service quality of internet banking labeled as 'efficiency and security', 'fulfillment' and 'responsiveness'.

Shamdasani et al (2008) tested a comprehensive model for service quality perceptions of self service technology like internet banking and identified the antecedents and consequences. The study found, speed of delivery, reliability, enjoyment and control were proven to be antecedents of service quality, whereas ease of use found to be an insignificant determinant of service quality. Perceived service quality, perceived risk, satisfaction and perceived value found to be the consequences.

Santouridis et al (2009) studied internet service quality and its impact on customer satisfaction, by examining internet banking customers in Greece. The study found six dimensions of internet banking service quality, which include responsiveness, empathy, and quality of information, web assistance, reliability and assurance. All six dimensions had found a significant effect on overall customer satisfaction.

Sohn and Tadisina (2009) measured e-service quality on internet-based financial institutions. The study revealed six dimensions that were, trust, customized communications, ease of use, website contents and functionality, reliability and speed of delivery. All six factors together explained 55 percent of the variance of the overall service quality.

Herington and Weaven (2009) measured e-service quality within the online banking context in Australia. Their study identified a four-factor solution to e-service quality labeled as “E-ServQual” which includes personal needs, site organization, user-friendliness and efficiency. The E-ServQual dimensions explained 38 percent variance in the dependent variable (satisfaction).

Rod et al (2009) presented a research model based upon the work of Jun and Cai (2001), Han and Baek (2004), and Yang et al (2004) which explained the relationships among online customer service quality, online information system quality, banking service product quality, overall internet banking service quality, and customer satisfaction in a New Zealand banking context. The study found that online information system quality was a stronger predictor of overall internet banking service quality than both online customer service quality and banking service product quality. The study also found that there was a strong positive association between overall internet banking service quality and customer satisfaction.

Khan et al (2009) measured the service quality of internet banking in India. The seven dimensions identified in this study were, reliability, accessibility, user-friendliness, privacy/security, efficiency, responsiveness, and fulfillment. The study revealed that customers were satisfied with the four service quality dimensions such as reliability, accessibility, privacy/security, responsiveness, and fulfillment, but least satisfied with the user-friendliness dimension.

Ho and Lin (2010) conducted a study in Taiwan’s internet banking users for measuring internet banking service quality. The scale consists of 17 items comprising of five dimensions, namely customer service, web design, assurance, preferential treatment, and information provision. This study extracted five dimensions and explained 67.5 percent of the variance.

Al-Tarawneh (2012) measured the effect of e-service quality dimensions on internet banking customers in Jordan. Their study identified six dimensions, which influence e-service quality: reliability, responsiveness, ease of use, personalization, security and web site design. Reliability refers to “the ability to perform the promised service accurately and consistently, including frequency of updating the website, prompt reply to customer inquiries, and

accuracy of online purchasing and billing”. Responsiveness relate to “flexibility, prompt delivery, consistency and accuracy of service delivered”. Ease of use contains functions of web page searching. Personalization involves “individual designs for clients in accordance with their pattern of consumption and preferences”. Security addresses “the technical specifications of a web site’s security and payment methods, reputation of the company and confidentiality”. Web site design refers to “technical development, information structure, visual design and networked delivery of websites”. These six dimensions constituted 33.2 percent of the variance in the dependent variable e-service quality.

Zavareh et al (2012) conducted a study in Iran’s internet banking users for measuring e-Service Quality (e-SQ). The study used E-SERVQUAL scale to determine the dimensions of e-SQ. The study found that efficient and reliable services, fulfillment, security/trust, site aesthetics, responsiveness/contact, and ease of use comprised the dimensions of e-SQ for internet banking services in Iran. These six dimensions constituted 70.8 percent of variance in the dependent variable e-service quality.

Punyani et al (2015) studied e-service and its impact on customer satisfaction, by examining internet banking customers in India. The study used WebQual 4.0 scale and found all the three variables, namely, usability, information quality, and interaction quality positively relates to the customers’ perception of e-service quality. The study also found that usability and information quality were the most influential factors on customer satisfaction.

Based on the above literature review, the prior studies on internet banking service quality and the various dimensions identified are summarized in TABLE 2.2.

TABLE 2.2: INTERNET BANKING E-SERVICE QUALITY STUDIES

Studies	Dimensions Identified
Joseph et al (1999)	Convenience/accuracy, feedback/complaint management, efficiency, queue management, accessibility, and customization.
Jun & Cai (2001)	Customer service quality, banking service product quality, and online system quality.
Jayawardhena (2004)	Access, website interface, trust, attention, and credibility.
Han & Baek (2004)	Tangibles, reliability, responsiveness and empathy.

Studies	Dimensions Identified
Yang et al (2004)	Reliability, competence, responsiveness, ease of use, security, and, product portfolio.
White & Ntli(2004)	Responsiveness, credibility, security, ease of use, product variety/diverse features.
Bauer et al (2005)	Security and trust, basic services quality, cross-buying services quality, added value, transaction support and responsiveness.
Siu & Mou (2005)	Credibility, efficiency, problem handling, and security.
Al-Hawari et al (2005)	Availability, easy to use, secure, error free transactions, attractiveness, interface accuracy and information updating.
Ibrahim et al (2006)	Convenience/accuracy, accessibility/reliability, good queue management, personalization, friendly/responsive customer service, and targeted customer service
Sohail & Shaikh (2008)	Efficiency and security, fulfillment, responsiveness.
Shamdasani et al (2008)	Speed of delivery, reliability, enjoyment and control.
Santouridis et al (2009)	Responsiveness, empathy, quality of information, web assistance, reliability and assurance.
Sohn & Tadisina (2009)	Trust, customized communications, ease of use, website contents and functionality, reliability and speed of delivery.
Herington & Weaven (2009)	Personal needs, site organization, user-friendliness and efficiency.
Rod et al (2009)	Online customer service quality, online information system quality, banking service product quality.
Khan et al (2009)	Reliability, accessibility, user-friendliness, privacy/security, efficiency, responsiveness, and fulfillment.
Ho & Lin (2010)	Customer service, web design, assurance, preferential treatment, and information provision.
Al-Tarawneh (2012)	Reliability, responsiveness, ease of use, personalization, security and web site design.
Zavareh et al (2012)	Efficient and reliable services, fulfillment, security/trust, site aesthetics, responsiveness/contact, and ease of use.
Punyani et al (2015)	Usability, information quality, and interaction quality.

The review of the above-mentioned studies of internet banking service quality, revealed that different studies had considered distinct dimensions and measurement scales. Past studies showed that, there was a multiplicity of constructs measuring e-service quality still grappling, which construct best represent the e-service quality of internet banking.

2.8 Development of Mobile Banking Paradigm

Mobile banking is one among the many applications offered by mobile commerce. Several definitions of mobile commerce were found in academic literature. MIS, management, and marketing all have various approaches to what exactly constitutes mobile commerce. The mobile-commerce can be defined as delivery of products and services via wireless technologies to enable e-commerce activities at any time or location (Mennecke & Strader, 2001). It can also be defined as the new type of e-commerce transactions, conducted through mobile devices using wireless telecommunications networks and other wired e-commerce technologies (Siau et al., 2001). Current mobile Internet applications enable customers to gain access to a variety of services: Web information search, SMS (short message services), MMS (multimedia message service), banking, payment, gaming, emailing, chat, weather forecast, GPS (Global Positioning Service), and so forth. Collectively, this wide array of services will be called as mobile commerce(m-commerce)(Okazaki, 2005). Mobile commerce is about buying and selling products and services through wireless handheld telecom devices such as mobile phones and PDAs. The main success factors of mobile commerce are its convenience, ease of use, ubiquity and trust (Xu & Gutiérrez, 2006). The uniqueness of a mobile commerce application is it is location sensitive, time critical and the application is controlled by the user or network service provider (Balasubramanian et al, 2002). These services can be accessed at anytime and anywhere. The mobile commerce is enabled through different technologies such as networking, embedded systems, database and security (Varshney & Veter, 2002). Mobile hardware, software and wireless technology together enable mobile commerce application, which can transmit data quickly, locate a user's position or conduct business anytime anywhere. Security and privacy are essential elements for the success of mobile commerce and its applications.

Mobile banking is considered to be one of the most value-added and important mobile commerce applications currently available (Lee et al., 2003; Varshney & Veter, 2002). Laukkanen and Kiviniemi (2010) defined mobile banking as “an interaction in which a

customer is connected to a bank via a mobile device such as cell phone, smart phone, or personal digital assistant (PDA)”. Mobile banking services allow customers to check account balances, transfer funds between accounts and order for electronic bill payments. There is a vast market potential for mobile banking due to its always-on functionality and the option to bank virtually any time and anywhere. The mobile phone, especially supports the provision of time-critical information, for example, for trading in stocks or if the acute need for money transfer or request of account balance. The customers using the mobile banking interact with the bank with the help of a mobile device. The key players for mobile financial applications include banks and other financial institutions such as credit-card companies, mobile operators and retailers (Mallat et al, 2004). Among this, customer considers banks as outstanding trustful service providers compared to other financial institutions (Mallat & Tuunainen, 2008).

2.9 Framework for understanding Mobile Banking Adoption

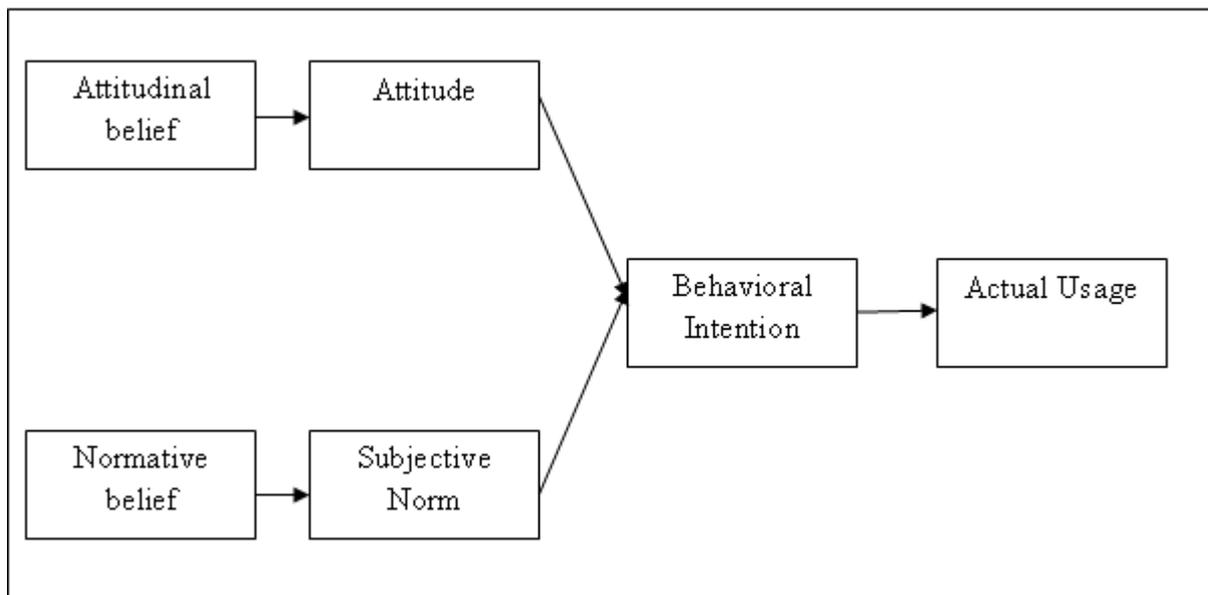
Mobile banking is a technological innovation, hence to understand the consumer adoption of these services; it is important to look into the various technology adoption models in the IS research. Technology adoption is one of the major areas of focus in IS (Information Systems) researchers. A variety of theoretical perspectives have been advanced to provide an understanding of the determinants of adoption. Individuals are the ultimate users and consumers in any information systems. The individual acceptance of IS had been studied from many theoretical viewpoints such as the act of adopting the technology or the relationship between individual acceptance and significant individual-level outcomes. Many theoretical models were derived from social psychology, such as the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), and the Theory of Planned Behavior (TPB) (Ajzen, 1991) to understand the behavioral intention to use new information systems and its usage.

2.9.1 Theory of Reasoned Action (TRA)

TRA (FIGURE 2.9) is derived from social psychology, one of the most fundamental and influential theories of human behavior. This theory specifies that human behavior is preceded by intentions, which were formed based on the individual's attitude towards the behavior and on perceived subjective norms. Attitude reflects the individual's feelings of favorableness or un-favorableness towards performing a behavior.

A person's attitude toward a behavior is determined by his salient belief on the consequences of performing the behavior, multiplied by evaluation of those consequences. Subjective norms capture the individual's perceptions of the influence of significant others (e.g., family, peers, authority figures, and media). TRA has been widely used and empirically tested within the context of information system acceptance (Davis et al, 1989; Mathieson, 1991; Taylor & Todd, 1995).

FIGURE 2.9: THEORY OF REASONED ACTION (TRA) (FISHBEIN & AJZEN, 1975)



Most of the information systems (IS) usage and adoption relied on models derived from the Theory of Reasoned Action (TRA) and its extensions.

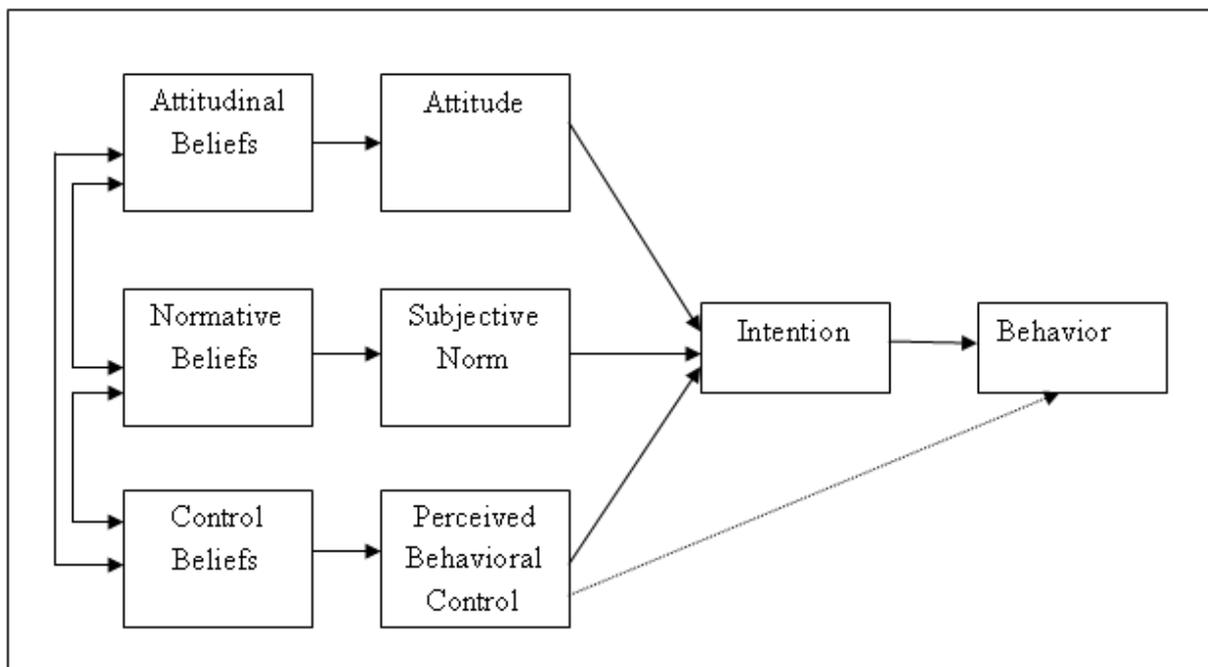
2.9.2 Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) (Ajzen, 1991)(FIGURE 2.10) is derived from the Theory of Reasoned Action (TRA), to account for conditions where individuals do not have complete control over their behavior. It is one of the most influential theories in predicting behavior. In this theory, behavior is a direct function of behavioral intention (BI) and perceived behavioral control (PBC). TPB is extended from TRA by adding an additional construct called perceived behavioral control. PBC describes the resources and opportunities required to form a behavior. In TPB model, perceived behavioral control is theorized as an additional determinant of intention and behavior. According to TPB (Ajzen, 1991), an

individual's behavior can be explained by behavioral intentions, which is jointly influenced by attitude, subjective norms and perceived behavioral control. Attitude refers to an individual's positive or negative evaluative effect about performing a particular behavior. Subjective norms refer to an individual's perceptions of other people's opinions on if he or she should perform a particular behavior, and perceived behavioral control refers to an individual's perceptions of the presence or absence of required resources, or opportunities necessary for performing behavior.

The attitude, subjective norm, perceived behavioral control and the determinants of intention are determined by underlying belief structures referred as attitudinal beliefs, normative beliefs, and control beliefs. Attitudinal beliefs are, assessment about the likelihood of behavior's consequences. Normative beliefs are assessment about what important others might think of the behavior. TPB has proven to be a richer model provides deeper insights into the factors which influence an individual's intention and behavior (Mathieson, 1991; Pavlou & Fygenson, 2006).

FIGURE 2.10: THEORY OF PLANNED BEHAVIOR (TPB) (AJZEN, 1991)



TPB is an extension of the TRA model by adding perceived behavioral control, which improved the explanatory power of the model.

2.9.3 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (Rogers, 1995) was derived from sociology and used to study the innovation characteristics. An innovation is defined as “ as an idea, practice or object that is perceived as new by an individual or other unit of adoption” (Rogers,2003). The core idea of innovation diffusion is the process in which innovation is communicated through certain channels, over time among the members of a social system. The diffusion rate is influenced by adopter characteristics, the social network they belong to, the communication process, the characteristics of the promoters and the innovation attributes. According to IDT, individuals react differently to a new idea, practice or object due to their difference in innovation characteristics. The perceived characteristics of an innovation are the key determinants of the adoption outcomes. Rogers (1995) classified individuals into various adoption categories based upon the innovation characteristics. The adopter categories are innovation adopters, early majority, late majority and laggards. Innovators and early adopters are willing to take a risk of trying out a new idea ahead of others. The adoption decision of innovators and early majority are based on their vision, intuition rather than external references. The innovators are more risk taking individuals and more technically advanced. The early majority is more practical-driven, and their adoption decision is influenced by well constituted references. The late majority adopts a new technology when it becomes a constituted standard. A laggard tends to be very cautious about innovation and adopt an innovation only when it is necessary. The core constructs of this model are relative advantage, compatibility, complexity, observability and trialability. These constructs are used to explain innovation characteristics and adoption intentions. Relative advantage is defined as “the degree to which an innovation is perceived as being better than its precursor” (Rogers, 1995). Complexity opposite to ease of use is defined as “the degree to which innovation is perceived as being difficult to use” (Rogers, 1995). Compatibility is defined as the “ the degree to which an innovation is perceived as being consistent with existing values, needs and past experiences” (Rogers, 1995; Moore & Benbasat, 1991). Observability is defined as “the degree to which an innovation is visible to others” (Rogers, 1995). Trialability is defined as “the degree to which an innovation may be experimented” (Rogers, 1995).

The IDT (Rogers, 1995) posits that the perceived innovation attributes influence the individual usage of an innovation. Existing research suggested that relative advantage, complexity and compatibility were consistently related to innovation adoption and diffusion

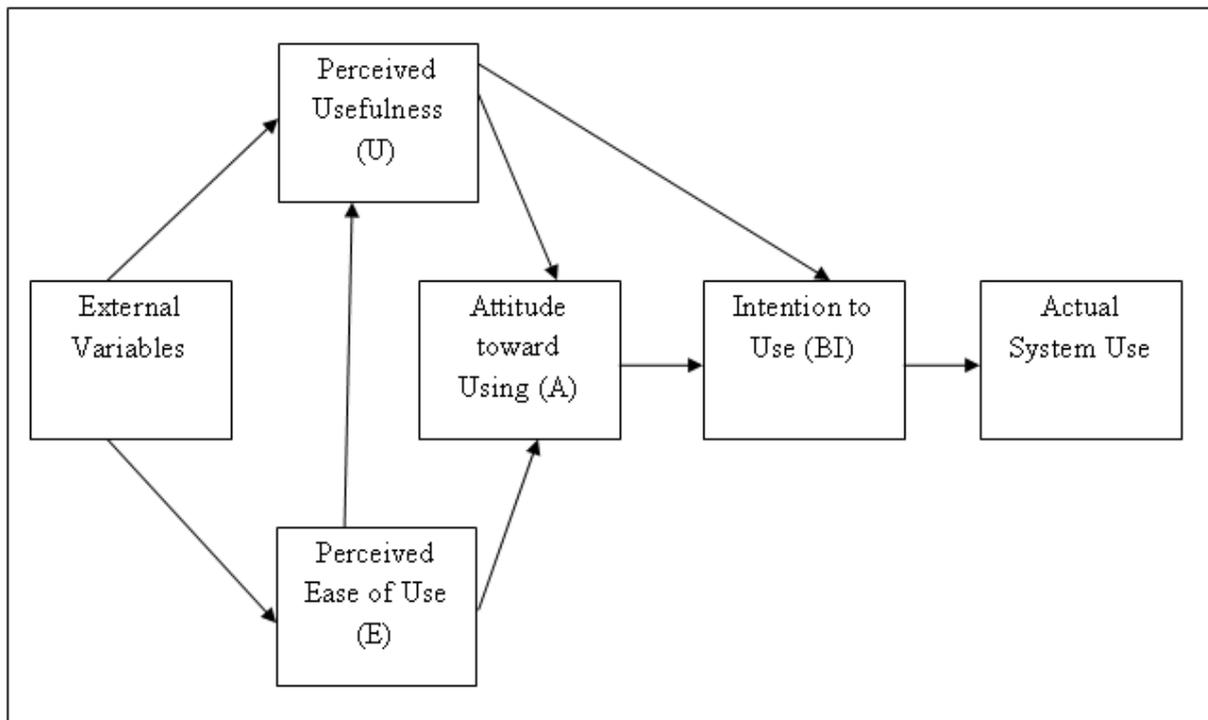
of Internet technologies (Tornatzky & Klein, 1982 cited in Yi et al, 2006; Moore & Benbasat, 1991; Agarwal & Prasad, 1997; Wu & Wang, 2005; Lin, 2011). TAM and IDT are extremely similar in some constructs, such as the relative advantage, which is similar to perceived usefulness in TAM, where as complexity in IDT, is similar to perceived ease of use in TAM.

Innovation Diffusion Theory (IDT) or Diffusion of Innovation (DOI) is a widely accepted model to study any innovation, and this model categorizes an individual based on innovation characteristics.

2.9.4 Technology Acceptance Model (TAM)

TAM model (FIGURE 2.11) is the most predominant models in IS (Information System) research. The TAM model (Davis, 1989) describes a consumer's willingness to use technology. This model was derived from TRA (Fishbein & Ajzen, 1975). The TAM is tailor-made for IS context, and was designed to predict information technology acceptance and usage in the organization. It is an intention-based model which uses behavioral intention to predict usage and consists of five constructs, which are perceived usefulness, perceived ease of use, attitude, intention to use and actual use. It uses to predict antecedents of system usage through two primary beliefs: the perceived ease of use and the perceived usefulness. According to TAM, perceived usefulness and perceived ease of use are the primary drivers of new technology acceptance. Perceived usefulness is defined by Davis (1989) as “the degree to which a person believes that using a particular system would enhance the job performance.” Perceived ease of use is defined as “the degree to which a person believes that system is easy to learn and use “(Davis, 1989; Davis et al, 1989). The behavioral intention is determined by attitude towards usage, as well as by the direct and indirect effects of perceived ease of use and perceived usefulness. Perceived usefulness and Perceived ease are the key determinants of usage. In this model, behavioral intention is the sole direct determinant of usage. This model treated intention as a mediating variable for two reasons: the first one is the intention to carry out a behavior is thought to be a necessary precursor to actual behavior itself; secondly, intention is found to increase the predictive power of this model (Taylor & Todd, 1995). External variables included in this model are expected to influence intentions and usage through perceived ease of use and perceived usefulness.

FIGURE 2.11: TECHNOLOGY ACCEPTANCE MODEL (TAM) (DAVIS, 1989; DAVIS et al, 1989)



The major criticism of TAM is, it didn't measure the actual usage behavior, rather it relied completely on measures of usage intention (Mathieson, 1991; Davis et al., 1992; Taylor & Todd, 1995). Another drawback of TAM is, it provides limited guidance about how to influence usage through to system design. Many researchers have extended the original TAM to improve the explanatory power of this model, by adding additional constructs from related models; alternatively, examining external variables, which are antecedents to perceived usefulness and perceived ease of use or moderate the influence of these primary beliefs (Taylor & Todd, 1995; Mathieson et al, 2001; Gefen & Straub, 1997; Venkatesh, 2000; Agarwal & Prasad, 1997; Karahana et al, 1999; Venkatesh & Morris, 2000).

TAM is the most simplified and parsimonious models in IS research, which can measure the intention to use of any information system.

2.9.5 TAM2 (Venkatesh & Davis, 2000)

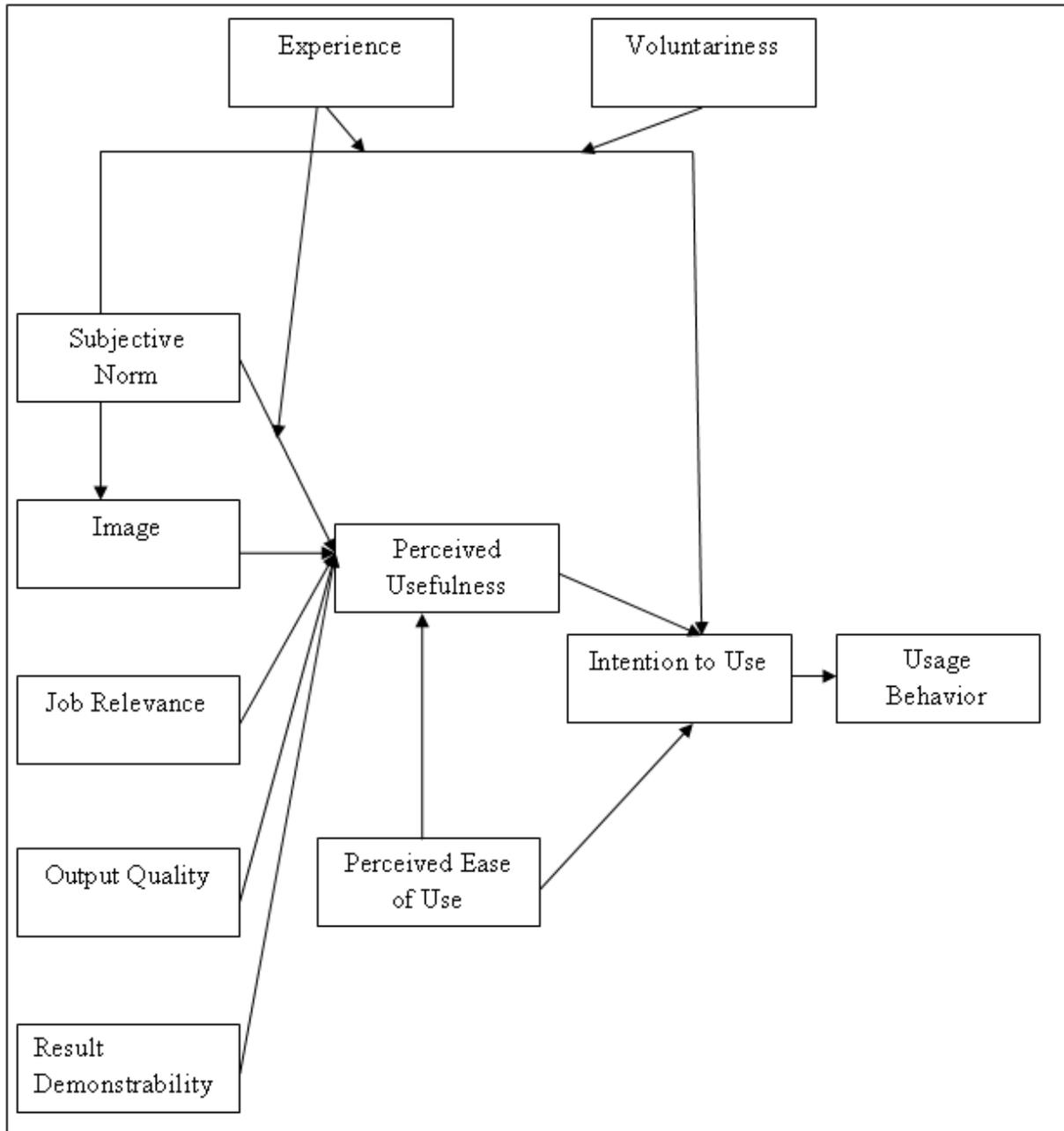
Venkatesh and Davis (2000) extended TAM called TAM2 by adding social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) as

determinants of perceived usefulness and usage intentions (FIGURE 2.12). Venkatesh and Davis (2000) identified the general determinants of perceived usefulness as perceived ease of use, subjective norm, image, job relevance, output quality, and result demonstrability. The two moderators presented in this model are experience and voluntariness. In TAM2, both the social influence processes and cognitive influence processes together explain the effects of the various determinants of perceived usefulness and behavioral intention. Subjective norm and image, which are the determinants of perceived usefulness represents the social influence processes. The social influence process is based on three concepts: compliance, internalization, and identification. Compliance represents “a situation in which an individual performs a behavior in order to attain certain rewards or avoid punishment” (Miniard & Cohen, 1979). Identification refers to “an individual’s belief that performing a behavior will elevate his or her social status within a referent group because important referents believe the behavior should be performed” (Venkatesh & Davis, 2000). Internalization is defined as “the incorporation of a referent’s belief into one’s own belief structure” (Warshaw, 1980). TAM2 theorizes that, subjective norm and image will positively influence perceived usefulness, through the process of internalization and identification respectively (Venkatesh & Davis, 2000). The effect of the subjective norm on both perceived usefulness and intention is moderated by experience over time.

TAM2 specifies the importance of three interrelated social influences that affect on an individual facing an opportunity to adopt or reject a new system: subjective norm, voluntariness, and image. The definition of the subjective norm is consistent with the existing theories of TRA (Fishbein & Ajzen, 1975) and TPB (Ajzen, 1991). TAM2 posits that in mandatory settings, compliance-based effect of a subjective norm has a direct effect on intention. This model introduced voluntariness as a moderating variable to distinguish between voluntary and mandatory settings. Voluntariness is defined as “the extent to which the potential adopters perceive the adoption decision to be non-mandatory” (Agarwal & Prasad, 1997; Moore & Benbasat, 1991). TAM2 theorizes that due to internalization, subjective norm has an indirect effect on intention through perceived usefulness. Subjective norm will positively influence the image with the effect of identification. Image is defined as the “the degree to which use of innovation is perceived to enhance one’s image or status in one’s social system” (Moore & Benbasat, 1991). TAM2 theorizes that image has a direct effect on perceived usefulness. The direct effect of the subjective norm on intention

attenuates with the increased level of experience with the particular system in mandatory settings. The effect of the subjective norm on perceived usefulness also decreases with the experience in both voluntary and mandatory settings.

FIGURE 2.12: TAM2 (VENKATESH & DAVIS, 2000)



TAM2 theorizes that there are four cognitive determinants of perceived usefulness: job relevance, output quality, result demonstrability and perceived ease of use. This theory articulates that “people use a mental representation for assessing the match between

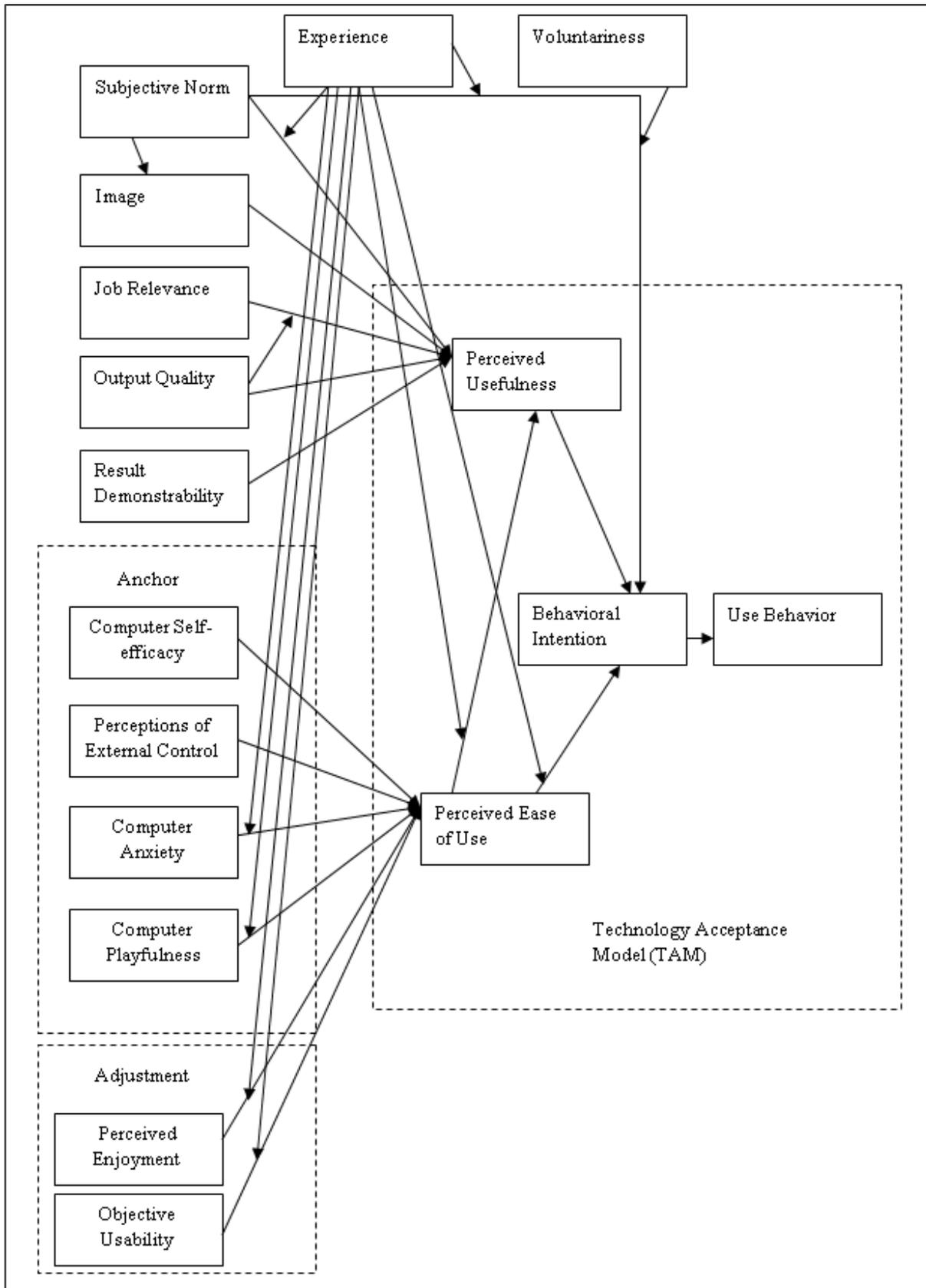
important work goals and the consequences of performing the act of using a system as a basis for judgments about the user-performance contingency”. Job relevance is one of the key components of this matching process. Venkatesh and Davis (2000) defined job relevance as “an individual’s perception regarding the degree to which the target system is applicable to his or her job”. TAM2 posits that job relevance, output quality, result demonstrability and perceived ease of use are direct determinants of perceived usefulness. Output quality is the perceptions of how well the system performs the tasks (Venkatesh & Davis, 2000). Result demonstrability is defined as the “tangibility of the results of using the innovation” (Moore & Benbasat, 1991). Perceived ease of use is retained in TAM2 from original TAM as a direct determinant of perceived usefulness. TAM2 hypothesized that perceived ease of use and result demonstrability has a direct positive influence on perceived usefulness. Job relevance and output quality have a moderating effect on perceived usefulness. TAM2 explained 60% of variance in user perceptions and 52% of variance in usage intentions.

2.9.6 TAM3 (Venkatesh & Bala, 2008)

Venkatesh and Bala (2008) developed an integrated model of technology acceptance-TAM3 (FIGURE 2.13), by combining TAM2 (Venkatesh & Davis, 2000) and the model of the determinants of perceived ease of use (Venkatesh, 2000). The details of TAM2 were discussed above. The determinants of perceived ease of use suggested by Venkatesh (2000) are computer Self-efficacy, computer anxiety, perception of external control, computer playfulness, perceived enjoyment and objective usability.

Among this, the first four were anchors who drive initial judgments of perceived ease of use. Individuals will form early perceptions of perceived ease of use based on these anchors. The anchors; computer self-efficacy, computer anxiety and computer playfulness are associated with the general beliefs regarding computers and computer use. Computer self-efficacy refers to “the degree to which an individual believes that he or she has the ability to perform a particular task/job using the computer” (Compeau & Higgins, 1995a, 1995b). Computer anxiety is defined as the degree of “an individual’s apprehension, or even fear, when he/she is faced with the possibility of using computers” (Venkatesh, 2000). Computer playfulness is defined as the “degree of cognitive spontaneity in microcomputer interactions” (Webster & Martocchio, 1992).

FIGURE 2.13: TAM3 (VENKATESH & BALA, 2008)



Perception of external control refers to the “degree to which an individual believes that organizational and technical resources exist to support the use of the system” (Venkatesh, 2000). Perceived enjoyment and objective usability are the adjustments suggested by Venkatesh (2000), which are the determinants of perceived ease of use after the individuals gain experience of using the system. Perceived enjoyment is defined as “the extent to which the activity of using the system perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use” (Venkatesh, 2000). Objective usability referred as “a comparison of systems based on the actual level (rather than perceptions) of effort required to completing specific tasks” (Venkatesh, 2000).

TAM3 posits that: (I) the effect of perceived ease of use on perceived usefulness will be moderated by experience; and (II) the determinants of perceived ease of use will not have any significant effects on perceived usefulness over and above the determinants of perceived usefulness (Venkatesh & Bala, 2008). The determinants of perceived ease of use are individual differences' variables and general beliefs about computers and computer use. The new relationships suggested by TAM3 (Venkatesh & Bala, 2008) as follows: experience moderated the relationships between (i) perceived ease of use and perceived usefulness; (ii) computer anxiety and perceived ease of use; and (iii) perceived ease of use and behavioral intention. Like other TAM models (Davis, 1989; Dais et al, 1989; Venkatesh & Davis, 2000; Venkatesh et al; 2003); perceived usefulness found to be the strongest predictor of behavioral intention in TAM3 (Venkatesh & Bala, 2008). TAM3 explained 53% variance in behavioral intention.

2.9.7 Review of TAM and its extensions

TAM is the most predominant and tailor-made model of IT adoption, which was originally developed to measure the IT acceptance in an organization. The main strength of this model is its parsimony; it can be used to measure the intention to use of any information technology/information system. The major drawback of TAM is that, it assumes that the usage is volitional, and it provides very little information about the system characteristics of the particular information system. Another limitation is that, TAM to a large extent ignores the possibility of external and situational influences particular about a circumstance or culture. Researchers have extended the TAM model by adding additional constructs, or by combining the model with other theories, examination of mediators, or by determining

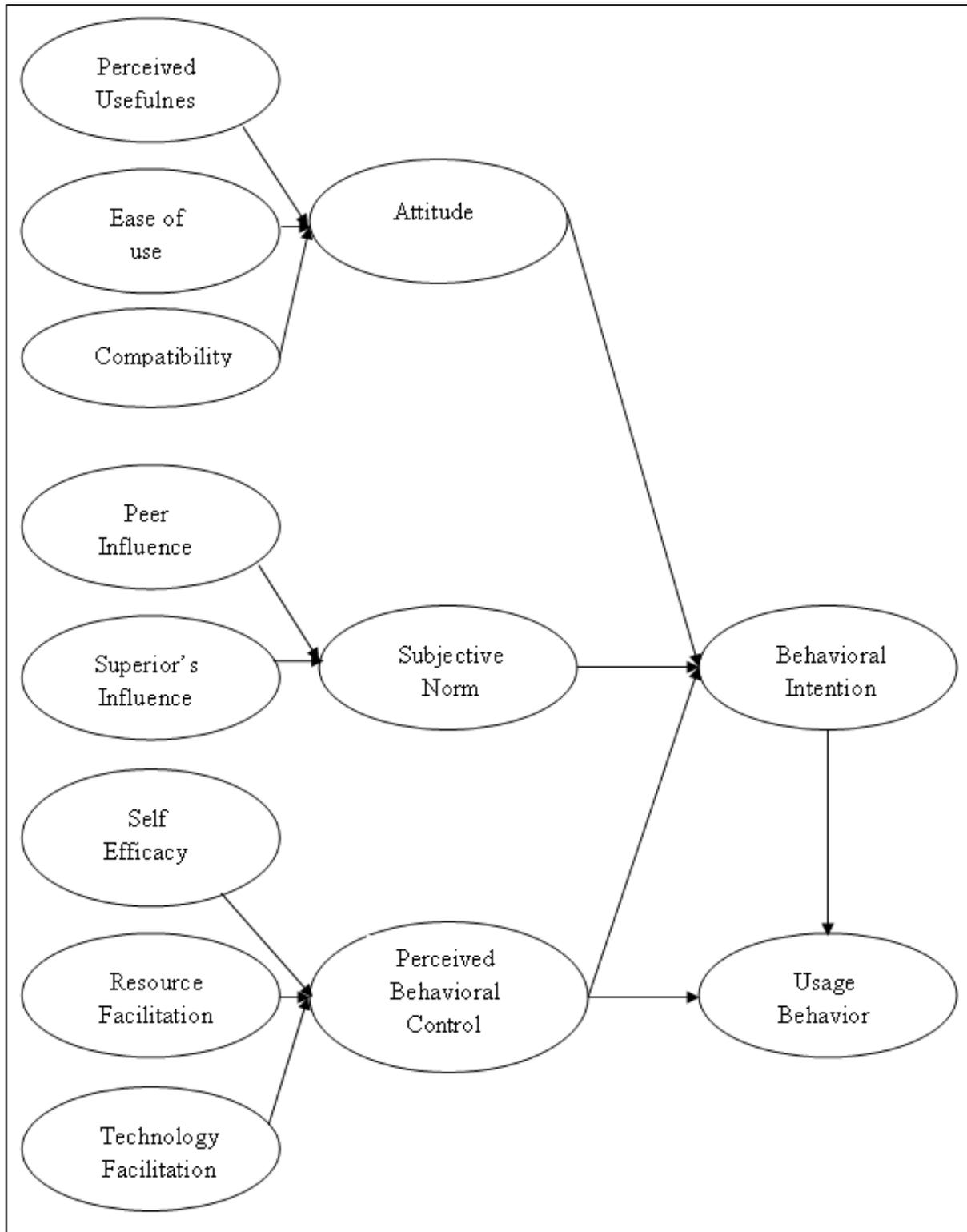
antecedents to perceived usefulness and perceived ease of use to predict the intention of using a new information system. The original model was further extended as TAM2 (Venkatesh & Davis, 2000) and TAM3 (Venkatesh & Bala, 2008), which increased the explanatory power of the model.

2.9.8 Decomposed Theory of Planned Behavior (DTPB)

The Decomposed Theory of Planned Behavior (Taylor & Todd, 1995) (FIGURE 2.14) is developed by modifying the TPB and integrating additional constructs within it. The attitudinal, normative and control beliefs are decomposed into multidimensional belief constructs. DTPB specifies that based from the Diffusion of Innovation theory (Rogers, 1983); the attitudinal belief has three salient characteristics of an innovation, which are relative advantage, complexity and compatibility that influence the adoption. Relative advantage is defined as “the degree to which an innovation is perceived as being better than its precursor” (Rogers, 1983). This construct is analogous to the “Perceived usefulness” construct in TAM (Davis, 1989). Complexity is defined as “degree to which an innovation is perceived to be difficult to understand, learn or operate “(Rogers, 1983) which is analogous to the “Perceived ease of use” construct in TAM (Davis, 1989). Compatibility is defined as the degree, to which an innovation is perceived as being consistent with existing values, needs and past experiences of the potential adopter (Rogers, 1983).

The subjective norm and perceived behavioral control are further decomposed in this theory into specific belief dimensions. The normative belief structure is further decomposed into relevant referent groups. In this model, subjective norm is decomposed to peer influence and superior influence. The perceived behavioral control (PBC) is decomposed into self-efficacy and facilitating conditions. The facilitating conditions (Triandis, 1979) represent the availability of resources required to perform a particular behavior. The facilitating condition construct provides two dimensions to control beliefs: resource facilitating conditions and technology facilitating conditions. Self-efficacy refers to the ability to perform a particular behavior successfully in the situation (Bandura, 1988). DTPB has the much explanatory power than its predecessors to understand the behavioral intention to use IT (Taylor & Todd, 1995).

FIGURE 2.14: DECOMPOSED THEORY OF PLANNED BEHAVIOR (DTPB) (TAYLOR&TODD, 1995)



According to the study conducted by Taylor and Todd (1995), TAM explains 52% of the variance in behavioral intention, pure TPB explains 57% variance, and DTPB explains 60%

of the variance in behavioral intention. This model provides a stable set of beliefs, which can be applied to a variety of settings.

DTPB is a better model of understanding IT usage, compare to other models and it incorporates several factors that were found to be important determinants of behavior.

2.9.9 Social Cognitive Theory (SCT)

Social Cognitive Theory (Bandura, 1977) is a widely accepted theory to study the individual behavior. SCT is a “theoretical framework for analyzing human motivation, thought and action that embrace an interactional model of causation in which environmental events, personal factors and behavior all operate as interactive determinants of each other”(Bandura,1986). This theory posits that a person’s behavior is partially shaped and controlled by the influences of the social system and the person’s cognition. The two major cognitive forces which influence an individual behavior are, self-efficacy expectations and outcome expectations. Outcome expectancy is defined as “a person’s estimate that a given behavior will lead to certain outcomes” (Bandura, 1977). Self-efficacy expectation is the “conviction that one can successfully execute the behavior required to produce the outcomes” (Bandura, 1977). This theory focuses exclusively on beliefs which influence the behavior, and those are independent of perceived outcomes. SCT says that “psychological procedures, whatever their form, alter expectations of personal efficacy” (Bandura, 1977) which in turn influence what actions to take, how much effort to invest, how long to persevere, and what strategies to use in challenging situations. SCT proposes that, there exists a continuous reciprocal interaction between the environment in which an individual operates his or her cognitive perceptions and behavior. The perceived self-efficacy helps to regulate one’s behavior and choice of activities based on the required effort and motivations. “Expectations of self-efficacy determines whether coping behavior will be initiated; how much effort will be expended, and how long it will be sustained in the face of obstacles and aversive experiences” (Bandura, 1977). SCT is applied in IS research (Compeau & Higgins, 1999) and empirically investigated the efficacy beliefs and the outcome expectations as the major cognitive forces guiding individual behavior in computer usage. Self-efficacy influences both personal and performance-related outcome expectations (Compeau & Higgins, 1999). Self-efficacy belief is extended in IS research, referred as computer self-efficacy (CSE), defined as one’s perception of his/her ability to use a computer (Compeau & Higgins, 1995).

Computer self-efficacy (CSE) is a multi-level construct operating on the general computing level (General CSE) and application-specific (Marakas et al., 1998). General CSE is defined as an individual's judgment of the efficacy of using computers. Application-specific self-efficacy is one's judgment of efficacy in using a specific application or task within the domain of general computing. Drawing upon SCT, many studies have proven the relationship between self-efficacy, outcome expectations and computer use (Compeau & Higgins, 1999; Yi & Hwang, 2003; Fagan et al, 2004; Hsu & Chiu, 2004; He & Freeman, 2010).

This model argues that the individual behavior is partially shaped and controlled by the influence of social system and an individual's cognitive beliefs.

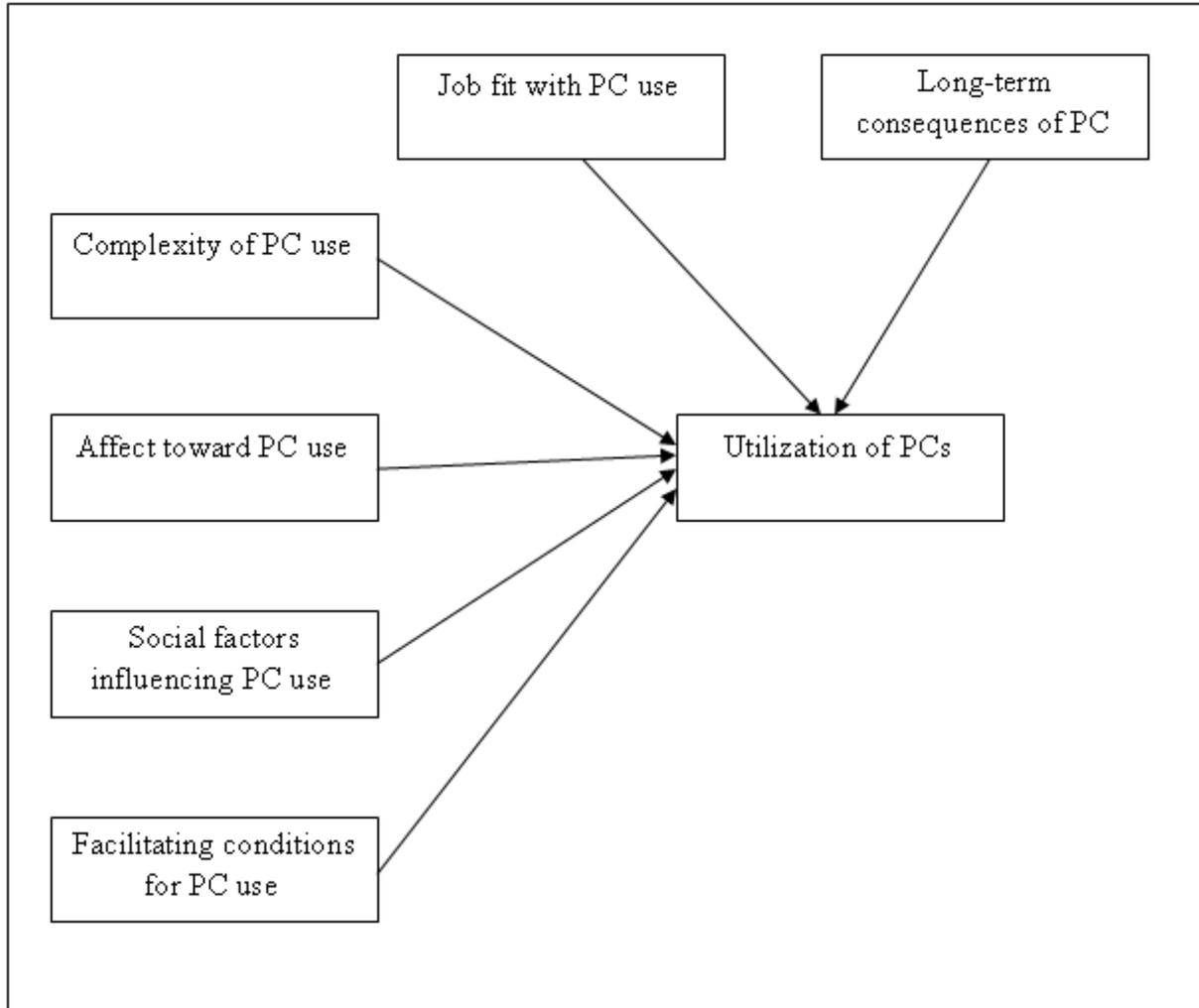
2.9.10 Model of PC Utilization (MPCU)

Thompson et al (1991) tested Triandis (1980) theory in the IS context and developed the theory of PC Utilization (MPCU). Triandis (1980) theory of behavior is a competing theory to TRA (Fishbein & Ajzen, 1975). Triandis(1980) theory proposed that “behavioral intentions are determined by feelings people have toward the behavior (affect), what they think they should do(social factors), and by the expected consequences of the behavior”. Behavior, in turn, is influenced by their habits, behavioral intention and facilitating conditions. Thompson et al (1991) proposed PC utilization theory (FIGURE 2.15) derived from Triandis (1980) theory of attitude and behavior. This theory postulates that utilization of a PC would be influenced by the affect toward using PC, social factors, complexity, job fit, long-term consequences and facilitating conditions. MPCU (Thompson et al,1991) includes six factors, which are hypothesized to influence PC utilization were: social factors influencing PC use, affect toward PC use, complexity of PC use, facilitating conditions for PC use, job fit with PC use and long-term consequences of PC use. Complexity, job fit and long-term consequences are three distinct components of perceived consequences.

Triandis(1980) defined social factors as “ the individual's internalization of the reference groups' subjective culture, and specific interpersonal agreements that the individual has been made by others, in specific social situations”. Subjective culture consists of norms- self-instructions to do what is perceived to be correct and appropriate by members of a culture in certain situations; roles- behaviors that are considered correct, but relate to persons holding a

particular position in a group, society, or social system; and values- abstract categories with strong affective components.

FIGURE 2.15: MODEL OF PC UTILIZATION (MPCU) (THOMPSON et al, 1991)



Affect (Triandis, 1980) is referred as “the feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act”. Perceived Consequences (Triandis, 1980) are defined as “each act is perceived as having potential consequences that have value, together with the probability that the consequence will occur”. Perceived consequence construct is having three dimensions: complexity, job fit and long-term consequences of use. The first two of them are on the near term in nature, while the third is more future oriented. Complexity (Rogers, 1995) defined as “the degree to which an innovation is perceived as relatively difficult to understand and use”. The perceived job fit (Thompson et al, 1991) measures the “extent to which an individual believes that using a PC

can enhance the performance of his/her job". The long-term consequences of use (Thompson et al, 1991) are "outcomes that will have a payoff in the future". Facilitating conditions (Triandis, 1980) defined as "objective factors 'out there' in the environment that several judges or observers can agree to make an act easy to do".

MPCU theory covers cognition beliefs, social influence factors, affect, and facilitating conditions, which influence the behavior of utilizing a personal computer in an organizational setting.

2.9.11 Motivational Model (MM)

Motivation theory is a grounded theory from psychology explains human behavior. This theory is adapted in many studies in a wide variety of domains (George & Brief, 1996; Ellis et al, 1997; Teo et al, 1999; Venkatesh & Speier, 1999; Fagan et al, 2008). Two broad classes of motivation: extrinsic and intrinsic motivation which is key determinants of performing the behavior. Intrinsic motivation refers to the pleasure, and the inherent satisfaction derived from a specific activity (Vallerand, 1997). Extrinsic motivation emphasis on performing an activity because it is perceived to be instrumental in achieving valued outcomes (Deci, 1975). Both intrinsic and extrinsic motivations together influence an individual's intention to perform an activity as well as actual performance (Deci, 1975). Davis et al (1992) applied motivational theory to understand the new technology adoption and use. Extrinsic motivation is defined as " the perception that an individual wants to perform an activity because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay or promotions"(Davis et al,1992). Davis et al (1992) conceptualized and operationalized extrinsic motivation as perceived usefulness. Extrinsic motivation to use a technology in a workplace is linked to job performance. If an individual perceives a technology to facilitate increased productivity, he/she is likely to have extrinsic motivation to use that technology in a workplace (Davis et al, 1992). Intrinsic motivation is the perception that an individual wants to perform an activity "for no apparent reinforcement other than the process of performing the activity per se" (Davis et al, 1992). Intrinsic motivation is conceptualized and operationalized as perceived enjoyment- the extent to which using a computer is perceived to be enjoyable distinct from performance outcomes (Davis et al, 1992). Hence, persons who experience immediate pleasure and joy of using a computer are more likely to use it than others.

The Motivational model explains both extrinsic and intrinsic motivation, which is used in technology adoption for the development of the constructs, perceived usefulness and perceived enjoyment respectively.

2.9.12 Unified Theory of Acceptance and Use of Technology (UTAUT)

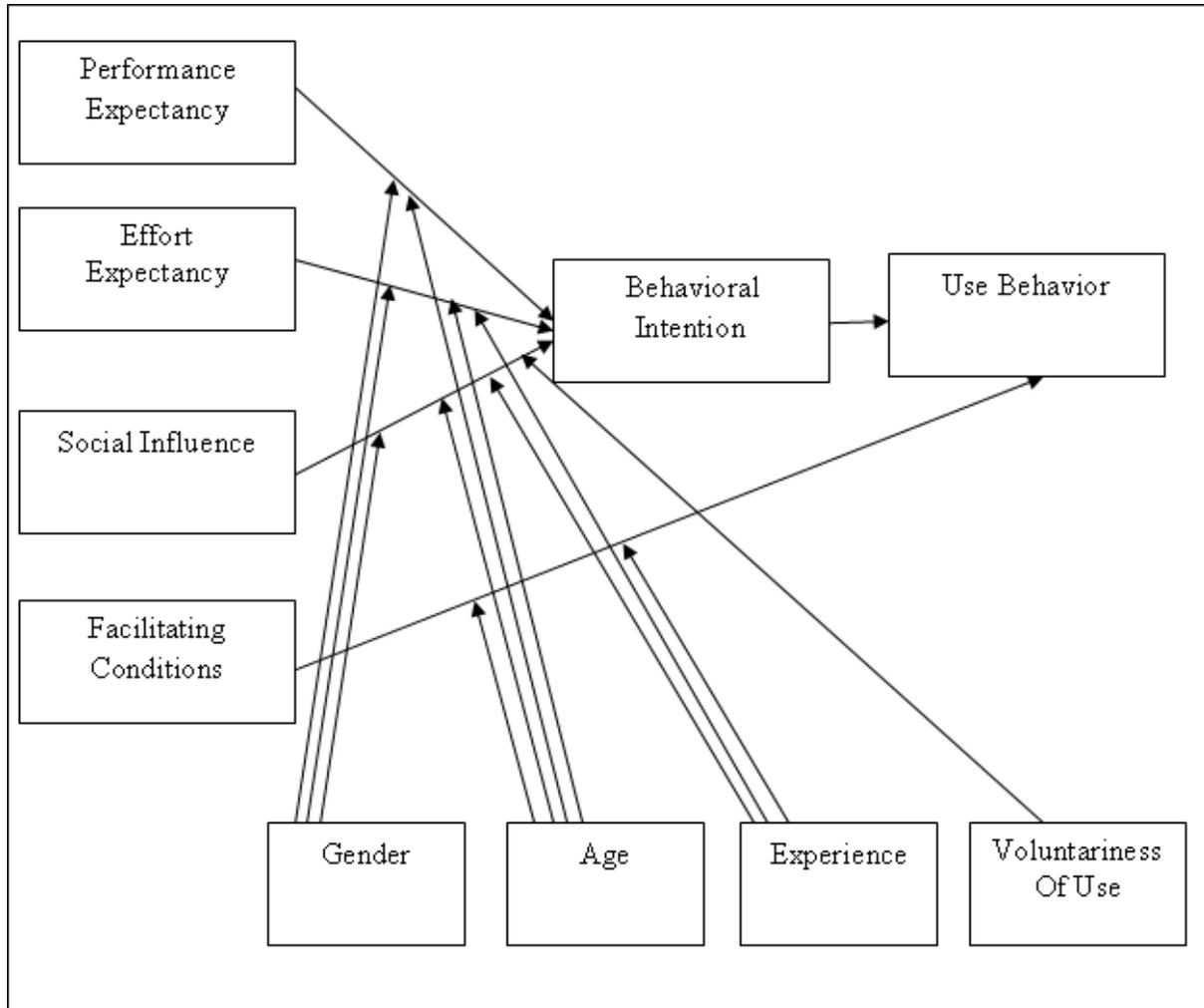
Venkatesh et al (2003) integrated elements from eight widely accepted models of IS (Information System) and developed a model called Unified Theory of Acceptance and Use of Technology (UTAUT) (FIGURE 2.16). The eight prominent models used in UTAUT were the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), Decomposed Theory of Planned Behavior (DTPB) (Taylor & Todd, 1995), Model of PC Utilization (MPCU) (Thompson et al, 1991), Motivational Model (MM) (Davis et al, 1992), Innovation Diffusion Theory (IDT) (Rogers, 1995) and Social cognitive Theory (SCT) (Bandura, 1986). These eight models were discussed in the previous sections of this chapter. The four core constructs which are determinants of intention and usage are performance expectancy, effort expectancy, social influence and facilitating conditions. The four moderators used in this model are age, experience, gender, voluntariness of use. Performance expectancy (Venkatesh et al, 2003) is defined as “the degree to which an individual believes that using the system will help him or her to attain gains job performance”. The performance expectancy construct was devised from five constructs across the different models which are perceived usefulness (TAM/ TAM2, DTPB), extrinsic motivation (MM), job-fit (MPCU), relative advantage (IDT) and outcome expectations (SCT).

Effort expectancy (Venkatesh et al, 2003) is defined as “the degree of ease associated with the use of the system”. This construct was formulated from three constructs: perceived ease of use (TAM/ TAM2), complexity (MPCU), and ease of use (IDT). Social influence (Venkatesh et al, 2003) is defined as “the degree to which an individual perceives that important others believe he or she should use the new system”. The core constructs used to define social influence were the subjective norm (TRA, TAM2, and TPB/DTPB), social factors (MPCU), and image (IDT). Facilitating conditions are defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system”. This construct was conceptualized from the following constructs;

perceived behavioral control (TPB/DTPB), facilitating conditions (MPCU) and compatibility (IDT).

FIGURE 2.16: UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

(VENKATESH et al, 2003)



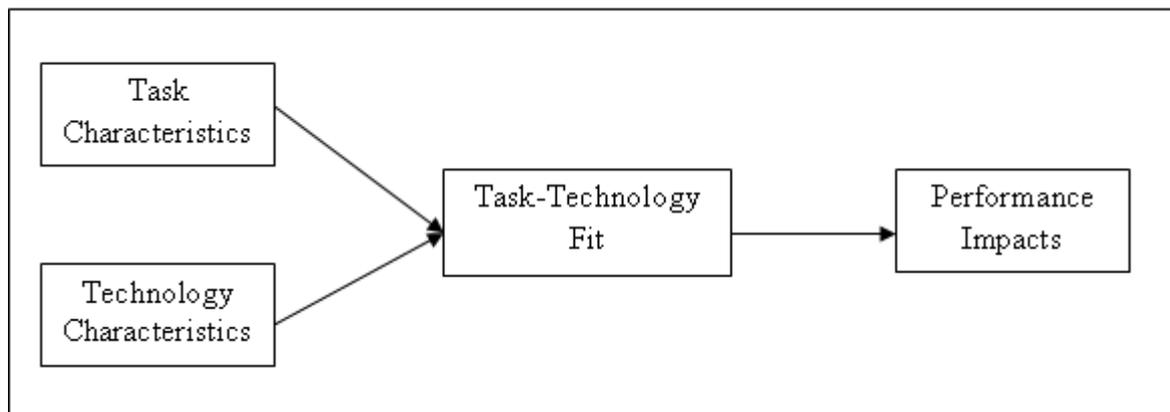
This model is widely used to study the behavior intention to use various information systems (Wang & Yang, 2005; S.S. Al-Gahtani et al, 2007; Zhou et al, 2010; I. Im et al, 2011; Foon & Fah, 2011; Yu, 2012).

UTAUT has the better predictive power than the previous eight models, which was used to explain the behavior intention. This model could account for 70 percent of the variance in usage intentions.

2.9.13 Task-Technology Fit Model (TTF)

This model is based on the match between user task needs and the available functionality of the IT (Information Technology). TTF (Goodhue, 1988) construct refers to the ability of IT to support a task. Task-technology-fit (TTF) (Goodhue & Thompson, 1995) (FIGURE 2.17) are the “degree to which a technology assists an individual in performing his or her portfolio of tasks”. The antecedents of TTF are task, technology and individuals. The relationship between TTF, task, and technology as follows: when the tasks become more demanding and the technologies offers less functionality, TTF will decrease (Goodhue & Thompson, 1995). Tasks are broadly defined as “the actions carried out by individuals in turning inputs to outputs” (Goodhue & Thompson, 1995). Technologies are the tools used by the individuals to carry out their tasks. According to the information technology context, technology refers to the computer systems and the user support services which are provided to assist an individual to carry out their tasks.

FIGURE 2.17: TASK-TECHNOLOGY FIT MODEL (TTF) (GOODHUE & THOMPSON, 1995)



Goodhue and Thompson (1995) integrated task-technology fit and utilization research to develop a model called Technology-to-Performance Chain (TPC). TPC posits that technologies must be utilized and fit the task they support to have a performance impact (Goodhue & Thompson, 1995). Dishaw and Strong (1999) integrated TAM model and TTF model and found the combined model has a much explanatory power than either of these models.

This model uses a rational approach, in which the outcome depends upon the type of technology used and for the task, it is used.

2.10 Previous Studies on Mobile Banking Adoption

Lee et al (2003) used the innovation attributes, and customers risk perceptions as a theoretical framework to study the adoption of 3G mobile banking services using ZMET technique in the UK. The study revealed that relative advantage, and compatibility showed a positive relation towards mobile banking adoption, where as perceived risk was the negative factor affecting mobile banking adoption, and consumers' previous experience generalized the beliefs about using mobile banking services.

Suronta and Matila (2004) studied the diffusion and adoption of mobile banking in Finland using the Bass model of diffusion. The Bass model assumes that potential adopters of an innovation are influenced by two types of communication channels: mass media (external influence) and interpersonal word-of-mouth (internal influence) channel with latter one is much more important. The survey respondents of 1253 were divided into three equal sized groups consisting of non-users, occasional users, and regular users based on their mobile banking usage experience and density. Their study identified that interpersonal influence was much more significant than mass media consistent with the Bass model arguments.

Kleijnen et al (2004) explored the factors affecting the wireless finance adoption in the Netherlands. The study extended the TAM model by adding perceived cost, system quality, and social influence with the latter two showed significant effects in the consumer acceptance of wireless finance. The study used moderating variables such as age, computer skills, mobile technology readiness, and social influence all proved to be significant in the study context.

Sivanand et al (2004) examined the perceived barriers to the adoption of mobile internet banking services using 218 bank account holders in the Klang Valley of Malaysia. The study identified three major areas, namely the banks, the telecommunication equipment, and the Internet service providers and identified barriers in each of these areas. The perceived barriers found in banks were, ease of access to relevant information, and value-added services; the telecommunication equipment: security, cost, and display screen size; Internet service providers: security in network, subscription cost, and connection speed.

Brown and Molla (2005) explored the factors that affect internet and cell phone banking using 142 respondents and 162 respondents respectively in South Africa. The factors identified in their order of importance were trialability, compatibility, complexity, relative advantage, and perceived risk.

Laforet and Li (2005) investigated the market status of online and mobile banking using 128 respondents in China. The results revealed that Chinese online and mobile banking customer's majorities were males, not necessary young and highly educated showed discrepancies between China and the Western countries in terms of user's demographic characteristics. The major barriers to mobile banking adoption were found as lack of awareness and lack of understanding about the benefits provided by mobile banking.

Laurn and Lin (2005) extended the TAM model in a mobile banking context, by adding one trust-based construct ("perceived credibility") and two resource-based constructs ("perceived self-efficacy" and "perceived financial cost") to the model to understand the behavioral intention to use mobile banking. Their study collected 180 data from Taiwan, and the results showed that perceived self-efficacy, perceived financial cost, perceived credibility, perceived ease of use, and perceived usefulness all had a significant effect on behavioral intention accounted 82 percent of the variance in behavioral intention.

Amin et al (2006) analyzed the undergraduate students' willingness to adopt mobile banking in Malaysia, and the results revealed that students will be willing to adopt mobile banking in the future.

Ainin et al (2007) adopted diffusion of innovation model and studied the mobile banking adoption using 279 respondents from Malaysia. Their study found that personal innovativeness and demographic factors such as age, gender, personal income, and educational background significantly influenced the adoption of mobile banking and perceived ease of use had a significant relation between perceived usefulness and perceived credibility.

Laukkanen (2007) explored and compared customer value perceptions in internet and mobile banking by using a means-end approach in Finland. The study found that location-free access

to the services was the main contributor of mobile banking, while the display of the device increased the negative value perceptions.

Lee et al (2007) extended the TAM model within the mobile banking context by adding perceived risk and trust and measured the adoption behavior in South Korea. The study found that perceived usefulness and trust had significant effects on mobile banking with the latter had a strong influence on mobile banking adoption, whereas perceived risk indirectly influenced adoption behavior through trust.

Amin et al (2008) extended the TAM model by adding the constructs perceived credibility, amount of information, and normative pressure to study the adoption of mobile banking using 158 bank customers in Malaysia. The results showed that perceived usefulness, perceived ease of use, perceived credibility, amount of information, and normative pressure all were significant determinants of mobile banking adoption together explained 80 percent variance to the behavioral intention and perceived ease of use strongly influenced perceived usefulness and perceived credibility.

Laukkanen and Pasanen (2008) investigated the difference of mobile banking innovators and early adopters from online banking users by conducting an online survey using 2675 respondents in Finland. The study results revealed that only age and gender differentiated these two groups of customers, while education, income, occupation, and size of the household were found to be insignificant in differentiating mobile banking and online banking users.

Chung and Kwon (2009) examined the factors influencing customers to use mobile banking in the Korean banking environment. Perceived usefulness and perceived ease of use were found to be the important determinants of intention to use mobile banking were perceived usefulness found to be a stronger predictor than perceived ease of use. This study used two moderator variables, which were mobile experience and technical support. The empirical analysis showed that mobile experience did not act as a moderator variable; it instead acted as a direct predictor of intention to use mobile banking. Technical support acted as a moderator variable between perceived usefulness and perceived ease of use.

Crabbe et al (2009) examined the reasons for the adoption and non-adoption of mobile banking in Ghana. Their study extended the TAM model with additional constructs such as perceived elitisation, perceived credibility, facilitating conditions, sustained usefulness and sustained usage. For adopters of mobile banking, their attitude was shaped by perceived credibility, facilitating conditions and moderated by age, education and banking experience; however, perceived ease of use didn't influence attitude. Perceived elitisation influenced adopter's behavioral intention, whereas attitude does not influence behavioral intention. For non-adopters of mobile banking, the major factors influenced attitude were perceived usefulness, perceived credibility, perceived elitisation, sustained usefulness and demographic profiles such as age, education, gender whereas attitude significantly influenced behavioral intention, which was also affected by gender and education.

Gu et al (2009) studied the factors contributing the users' intention to use mobile banking in Korea. The results revealed the effect of perceived usefulness, perceived ease of use, and trust on behavioral intention in mobile banking and explained 72.2 percent variance. The study also found that self-efficiency was the strongest antecedent to perceived ease of use, whereas structural assurance was the strongest antecedent to trust.

Kim et al (2009) explored the dynamics between initial trust and usage intentions of mobile banking using 192 cell phone users in Korea. The study used four antecedent variables (relative benefits, structural assurances, personal propensity to trust, and firm reputation) on shaping a person's initial trust and usage intentions. The results revealed that relative benefits, propensity to trust, and structural assurances significantly affected the initial trust, whereas relative benefits and initial trust directly affected the intention to use mobile banking.

Lee and Chung (2009) proposed a research model based on DeLone and McLean's model and assessed how the quality factors such as system quality, information quality, and interface design quality can affect satisfaction and trust with mobile banking. Their study surveyed 276 mobile banking customers in Korea and found that system quality and information quality significantly influenced customer's trust and satisfaction.

Yu and Fang (2009) established a measurement model for the post adoption user perception of mobile banking in Taiwan. Based on 458 valid responses of mobile banking users, the study identified an instrument consisting of 21 items and six factors, namely security service, interactivity, relative advantage, ease of use, interface creativity, and customer satisfaction. These six factors constituted the computation of customer post-adoption perception index.

Cruz et al (2010) investigated the barriers to mobile banking adoption using 3585 internet banking customers in Brazil. The results showed that majorities of the respondents were not using any kind of mobile banking services. The major obstacles of mobile banking were identified as perception of cost, risk, low perceived relative advantage, unsuitable device, and complexity.

Laukkanen and Kiviniemi (2010) investigated the effect of information on consumer resistance to the mobile banking services in terms of five adoption barriers, namely usage, value, risk, tradition, and image. Their study surveyed 1551 internet banking customers in Finland and identified that information and guidance offered by a bank has the most significant effect on decreasing the usage barrier, followed by an image, value, and risk barrier with no effect on the tradition barrier.

Mohammed-Issa and Twaissi (2010) investigated the consumers' attitudes and expectations towards mobile banking using the technology acceptance model (TAM) by conducting a survey of 275 data in Jordan. The empirical results revealed that attitude and perceived usefulness had a direct effect on behavioral intention, while perceived usefulness, perceived ease of use, and trust had a significant effect on attitude, and perceived ease of use and trust had a significant effect on perceived usefulness. The study also found that there was a significant effect between behavioral intention and actual use towards mobile banking with 53.6 percent of variance explained by behavioral intention.

Riquelme and Rios (2010) empirically tested the factors that influenced the adoption of mobile banking in Singapore and used gender as a moderator variable. They surveyed 600 current users of electronic banking, and their findings were in this order, usefulness, social norms, and social risk were the factors that influenced the users most to adopt mobile banking. Ease of use and social norms had a stronger influence on female respondents than

male, whereas the relative advantage had a stronger effect on the usefulness on male respondents.

Koenig-Lewis et al (2010) developed a research model built from TAM and IDT and explained 65 percent of the variance in intention to adopt mobile banking. Their study was based on 263 young consumers from Germany. The result from their study indicates that perceived usefulness, compatibility, and risk were significant predictors in the adoption of mobile banking, while perceived cost, perceived ease of use, credibility, and trust was not significant to predict the intention to adopt mobile banking. Compatibility was identified as a direct antecedent to perceived usefulness, perceived ease of use, and credibility, whereas trust and credibility identified as crucial factors in reducing the overall perceived risk.

Puschel et al (2010) proposed an integrated framework to study the adoption intention of mobile banking by combining the DTPB (Taylor & Todd, 1995), TAM (Davis, 1989), and the innovation diffusion theory (Rogers, 1962). They surveyed 666 respondents from Brazil, which comprised of mobile banking users and non users, and found that attitude; subjective norm, significantly affected the adoption intention; relative advantage, and compatibility significantly affected attitude; technology facilitating conditions, and self-efficacy significantly affected perceived behavioral control. The model explained 69 percent variance to the intention construct when applied to the mobile banking non-user group, whereas it explained 22 percent variance to the mobile banking users.

Wessel and Drennan (2010) identified the key motivators and inhibitors of consumer acceptance of mobile banking, using a web-based survey of 314 respondents in Australia. Their results supported a mediation model where attitude mediated the relationship between perceived usefulness, perceived risk, cost, compatibility, and the intention to use mobile banking. The study also found that perceived ease of use and need for interaction were not found to be significant predictors of attitude/intention to use mobile banking. The model explained 83.8 percent variance to the behavioral intention to use mobile banking.

Y. -C. Shen et al (2010) adopted the benefit-cost framework and explored the key benefit and cost which determine the adoption of the mobile banking systems. The study identified the key benefit of mobile banking as convenience, whereas the key cost identified was security.

The antecedents of convenience were found to be perceived behavior control, self-efficacy, and expertise. The antecedents of security were found to be technology anxiety, trust in telecom supplier, and behavioral introspection.

Zhou et al (2010) integrated the task technology fit (TTF) model and unified theory of acceptance and use of technology (UTAUT) model and proposed a mobile banking user adoption model. The study found that performance expectancy, social influence, task technology fit, and facilitating conditions had a significant influence on user adoption.

Luo et al (2010) explored the factors which influenced the initial acceptance of mobile banking using 122 respondents from the USA. The results showed that performance expectancy and perceived risk had significant effects on the intention to use mobile banking. The model explained 50.9 percent variance on behavioral intention.

Bankole et al (2011) explored the factors that influenced the adoption of mobile banking in Nigeria. The study revealed that culture was the most important factor, followed by utility expectancy and effort expectancy. There was no significant relationship found between trust, privacy, and social factors to the behavioral intention to use mobile banking.

Cheah et al (2011) empirically investigated the factors which influenced the adoption of mobile banking using 175 mobile users in Malaysia. Their findings revealed that perceived usefulness, perceived ease of use, relative advantages, perceived risk, and personal innovativeness were the factors which explained 37.2 percent variance to the behavior intention to adopt mobile banking.

Beiginia et al (2011) compared the theory of reasoned action (TRA), theory of planned behavior (TPB), and decomposed theory of planned behavior (DTPB) to identify the best model which predicts the intention to adopt mobile banking in Iran. The results showed that the decomposed theory of planned behavior (DTPB) predicts behavioral intention to use mobile banking better than the other two models.

Dasgupta et al (2011) investigated the antecedents of behavioral intention to mobile banking use in India. Their study identified six factors based on an exploratory factor analysis and followed by a regression analysis, which examined the effects of these antecedents on

behavioral intention. The factors identified were perceived usefulness, perceived ease of use, perceived image, perceived value, self-efficacy, perceived credibility, and tradition which all significantly affected the behavioral intention towards using the mobile banking.

Norzaidi et al (2011) examined the critical success factors which influenced the adoption of mobile banking using the extended TAM model in Malaysia. The study surveyed 300 bank customers, and the results revealed that perceived usefulness, perceived credibility, and customer awareness were found to have a significant relation with intention to use mobile banking, which explained 71.7 percent variance, whereas perceived ease of use and perceived risk were found to have no significant relation with intention.

Khraim et al (2011) surveyed 301 mobile phone users in Jordan and identified the underlying factors that affect mobile banking adoption. Their findings identified six factors; self-efficacy, trialability, compatibility, complexity, risk, and relative advantage all were statistically significant in influencing mobile banking adoption.

Lin (2011) used the innovation diffusion theory and knowledge-based trust literature to develop a research model which examined the effect of innovation attributes and knowledge-based trust on attitude and behavioral intention of adopting mobile banking among potential and repeated customers. Their study surveyed 368 customers (177 for potential customers and 191 for repeat customers) in Taiwan and the results showed that perceived relative advantage, ease of use, compatibility, competence, and integrity significantly influenced attitude, which in turn lead to the behavioral intention to adopt or continue to use mobile banking.

Sripalawat et al (2011) explored the factors on adoption and the barrier side of mobile banking using 195 respondents in Thailand. The adoption factors in their order of influence were the subjective norm, perceived usefulness, self-efficacy, and ease of use. Considering the barrier side, device barrier was the most important barrier of mobile banking, followed by lack of information, perceived financial cost, and perceived risk.

Zhou (2011) examined the effect of initial trust on mobile banking user adoption using 210 survey data in China. The study found that structural assurance, information quality, trust

propensity, and system quality significantly affects initial trust, whereas information quality and system quality significantly affects perceived usefulness. In addition, initial trust affects perceived usefulness, and both perceived usefulness and initial trust predict the usage intention of mobile banking.

Yu (2012) employed UTAUT model to study the factors affecting individuals to adopt mobile banking and surveyed 441 respondents in Taipei. The intention to adopt mobile banking was influenced by social influence, perceived financial cost, performance expectancy, and perceived credibility in their order of influence. The actual behavior was influenced by individual intention and facilitating conditions. In this study, gender significantly moderated the effects of performance expectancy and perceived financial cost on behavioral intention, where age considerably moderated the effects of facilitating conditions and perceived self-efficacy of actual behavior.

Ketkar et al (2012) studied the barriers and enablers of mobile banking using the interpretive structural modeling (ISM) method in India. The enablers/drivers of mobile banking identified were “facility to get quick updates”, “time and cost saving”, “reach of telecom distribution”, and “need for telecoms to improve customer retention”. The barriers/inhibitors identified were “lack of need for banking”, “quality of telecom service reach and reliability”, and “interoperability between banks and telecoms”.

Rejikumar and Ravindran(2012) examined the factors influencing the continuance decision to use mobile banking using 184 mobile banking users in India. Their study extended the TAM model with constructs of perceived service quality, perceived credibility, and perceived risk, and found strong links between perceived service quality, satisfaction, and continuance intentions, whereas perceived risk had significant influence on service quality and continuance intention.

Samudra and Phadtare (2012) investigated the factors influencing the adoption of mobile banking using the UTAUT model as the theoretical framework in Pune city in India using 109 bank customers. Their demographic findings revealed that mobile banking users were young, married, highly educated, and predominantly male members. The factors identified were convenience, compatibility, perception, social influence, and information.

Chen (2013) studied the effects of diffusion and adopters of mobile banking services, perceived risk, brand awareness and brand image on attitude and intention to use mobile banking services. Their study surveyed 610 customers (366 for frequent users and 244 for infrequent users) in Taiwan. The results showed that innovation attributes, perceived risk, brand awareness and brand image significantly influenced attitude and intention to adopt mobile banking services for frequent users. Relative advantage, compatibility, trialability, perceived risk, brand awareness and brand image significantly influenced attitude and intention to adopt mobile banking services for frequent users.

Aboelmaged and Gebba (2013) investigated the adoption of mobile banking by integrating the Technology Acceptance Model (TAM) and Theory of Planned Behavior (TPB) in Dubai using 119 respondents. The results revealed that attitude and subjective norm have a positive impact on mobile banking adoption and perceived usefulness had a significant impact on the attitude.

Jeong and Yoon (2013) examined the factors influencing the adoption of mobile banking using 165 respondents in the US. Their study was based on the extended TAM model and the results showed that perceived usefulness, perceived ease of use, perceived credibility, and perceived self-efficacy significantly influenced the adoption decision.

Chitungo and Munongo (2013) studied the mobile banking adoption in rural Zimbabwe by using extended TAM model as a theoretical framework. Their study collected responses from 275 respondents and the findings indicated that perceived usefulness, perceived ease of use, relative advantage, personal innovativeness and social norms significantly influenced the attitude which in turn influenced the adoption of mobile banking whereas the perceived risk and cost had a negative impact on the adoption of mobile banking.

Hanafizadeh et al (2014) studied the factors affecting the adoption of mobile banking in Iran. Their study obtained responses from 361 bank customers in Iran. The factors identified were perceived usefulness, perceived ease of use, the need for interaction, perceived risk, perceived cost, compatibility, perceived credibility, and trust.

Singh and Srivastava (2014) investigated the factors influencing the adoption of mobile banking using the extended TAM model as the theoretical framework in India using 120 bank customers. The factors identified in their order of influence were compatibility, social influence, and security.

Based on the above literature review, mobile banking adoption studies are summarized in TABLE 2.3.

TABLE 2.3: MOBILE BANKING ADOPTION STUDIES

Authors	Theories adapted	Country	Major Findings
Lee et al (2003)	IDT	UK	Relative advantage, compatibility, perceived risk, and consumer's previous experience significantly influenced the mobile banking adoption.
Suronta & Matila (2004)	Bass model of diffusion	Finland	Interpersonal influence, age, and income significantly influenced the adoption.
Kleijnen et al (2004)	Extended TAM model	Netherlands	Perceived cost, system quality with moderating variables of age, computer skills, mobile technology readiness, and social influence all contributed to the adoption of wireless finance.
Sivanand et al (2004)		Malaysia	Barriers in three major areas, namely the banks, the telecommunication equipment, and the internet service providers.
Brown & Molla (2005)	TAM and Perceived characteristics of innovation	South Africa	Triability, compatibility, complexity, relative advantage, and perceived risk significantly influenced cell phone banking adoption.

Authors	Theories adapted	Country	Major Findings
Laforet & Li (2005)	Attitude, behavior, and motivation	China	Awareness, confidential and security, new technology, and past technology experience were the factors of mobile banking.
Laurin & Lin(2005)	Extended TAM	Taiwan	Perceived self-efficacy, perceived financial cost, perceived credibility, perceived ease of use, and perceived usefulness significantly contribute to the adoption of mobile banking.
Amin et al (2006)	Attitude, Expectations, and Demographics	Malaysia	Attitude is significantly influenced by race, religion, age, and field of study. The expectation was influenced by race, religion, gender, and field of study.
Ainin et al (2007)	Diffusion of innovation model	Malaysia	Personal innovativeness and demographic factors such as age, gender, personal income, and education significantly influenced the adoption of mobile banking.
Laukkanen (2007)	Means-end approach	Finland	Location free access was the main contributor and display size of mobile device was the major inhibitor of mobile banking.
Lee et al (2007)	Extended TAM model	South Korea	The perceived usefulness and trust had significant effects on mobile banking whereas perceived risk indirectly influenced adoption behavior through trust.

Authors	Theories adapted	Country	Major Findings
Amin et al (2008)	Extended TAM model	Malaysia.	Perceived usefulness, perceived ease of use, perceived credibility, amount of information, and normative pressure all found to be significant determinants of mobile banking adoption.
Laukkanen & Pasanen (2008)	Diffusion of innovation model	Finland	Mobile banking innovators and early adopters from online banking users were differentiated by only age and gender while education, income, occupation, and size of the household were found to be insignificant.
Crabbe et al (2009)	Extended TAM model	Ghana	Perceived usefulness, perceived credibility, perceived elitisation, sustained usefulness, attitude, gender, and education influenced the intention.
Chung & Kwon (2009)	TAM with moderator variables mobile experience and technical support	Korea	Perceived usefulness, perceived ease of use and mobile experience are found to be the important determinants of intention to use mobile banking and technical support acted as a moderator variable between perceived usefulness and perceived ease of use.
Gu et al (2009)	Extended TAM model	Korea	Perceived usefulness, perceived ease of use, and trust influenced the intention to use mobile banking.

Authors	Theories adapted	Country	Major Findings
Lee & Chung (2009)	IS success model	Korea	System quality and information quality significantly influenced customers trust and satisfaction with mobile banking.
Kim et al (2009)	Theory of innovation	Korea	Relative benefits and initial trust directly influenced the intention to use mobile banking whereas relative benefits, propensity to trust, and structural assurances significantly affected the initial trust.
Lee & Chung (2009)	IS success model	Korea	System quality and information quality significantly influenced customers trust and satisfaction with mobile banking.
Cruz et al (2010)	TAM and Diffusion of Innovation	Brazil	Perception of cost, risk, low perceived relative advantage and complexity were the main reasons behind the reluctance to use mobile banking.
Mohammed-Issa & Twaissi (2010)	TAM model	Jordan	The empirical results revealed that attitude and perceived usefulness had direct effect on behavioral intention to use mobile banking.
Puschel et al (2010)	DTPB, TAM, and IDT	Brazil	Attitude and subjective norm, significantly affected the adoption intention of mobile banking.
Y.- C. Shen et al (2010)	Benefit-cost framework	Taiwan	The study identified the key benefit as convenience and the key cost identified was security of mobile banking.

Authors	Theories adapted	Country	Major Findings
Laukkanen & Kiviniemi (2010)	Consumer resistance theory	Finland	The effect of information and guidance offered by a bank has the most significant effect on decreasing the usage barrier, followed by image, value, and risk barrier with no effect on tradition barrier on mobile banking.
Y.- C. Shen et al (2010)	Benefit-cost framework	Taiwan	The study identified the key benefit as convenience and the key cost identified was security of mobile banking.
Koenig-Lewis et al (2010)	TAM and IDT	Germany	Perceived usefulness, compatibility, and risk were significant predictors in the adoption of mobile banking, while perceived cost, perceived ease of use, credibility, and trust were not significant to predict the intention to adopt mobile banking.
Riquelme & Rios (2010)	TAM ,TPB, and IDT with gender as a moderator variable	Singapore	Usefulness, social norms, and social risk were the factors that influenced the users most to adopt mobile banking. Ease of use and social norms had a stronger influence on female respondents, whereas relative advantage had a stronger effect on the usefulness on male respondents.

Authors	Theories adapted	Country	Major Findings
Luo et al (2010)	UTAUT	USA	Performance expectancy and perceived risk had significant effects on the intention to use mobile banking.
Wessel & Drennan (2010)	SST Attitude/Intention to Use Model	Australia	The results supported a mediation model where attitude mediated the relationship between perceived usefulness, perceived risk, cost, compatibility, and the intention to use mobile banking.
Zhou et al (2010)	TTF and UTAUT	China	Performance expectancy, social influence, task technology fit, and facilitating conditions were found to have significant influence on user adoption of mobile banking.
Bankole et al (2011)	UTAUT	Nigeria	Culture was the most important factor, followed by utility expectancy and effort expectancy that influenced the adoption of mobile banking.
Cheah et al (2011)	TAM and IDT	Malaysia	Perceived usefulness, perceived ease of use, relative advantages, perceived risk, and personal innovativeness were the factors which influenced the behavior intention to adopt mobile banking.
Zhou (2011)	TAM, IS Success Model	China	Perceived usefulness and initial trust predicted the usage intention of mobile banking.

Authors	Theories adapted	Country	Major Findings
Beiginia et al (2011)	TRA, TPB, and DTPB	Iran	The results showed that the decomposed theory of planned behavior (DTPB) predicts behavioral intention to use mobile banking better than TRA and TPB.
Norzaidi et al (2011)	Extended TAM model	Malaysia	Perceived usefulness, perceived credibility, and customer awareness were found to have a significant relation with intention to use mobile banking.
Khraim et al (2011)	IDT	Jordan	Self-efficacy, trialability, compatibility, complexity, risk, and relative advantage all were significant in influencing mobile banking adoption.
Lin (2011)	IDT and Knowledge- based trust	Taiwan	Perceived relative advantage, ease of use, compatibility, competence, and integrity significantly influenced attitude, which in turn lead to the behavioral intention to adopt or continue to use mobile banking.
Dasgupta et al (2011)	Extended TAM model	India	Perceived usefulness, perceived ease of use, perceived image, perceived value, self-efficacy, perceived credibility, and tradition which all significantly affected the behavioral intention towards using the mobile banking.

Authors	Theories adapted	Country	Major Findings
Sripalawat et al (2011)	Extended TAM model	Thailand	The adoption factors of mobile banking were subjective norm, perceived usefulness, self-efficacy, and ease of use, whereas barrier side include device barrier, lack of information, perceived financial cost, and perceived risk.
Yu (2012)	UTAUT	Taiwan	The intention to adopt mobile banking was influenced by social influence, perceived financial cost, performance expectancy, and perceived credibility in their order of influence.
Ketkar et al (2012)	Interpretive structural modeling	India	The enablers were facility to get quick updates, time and cost saving, reach of telecom distribution, and need for telecoms to improve customer retention. The barriers were lack of need for banking, quality of telecom service reach and reliability, and interoperability among banks and telecoms.
Rejikumar & Ravindran(2012)	Extended TAM model	India	The study found strong links between perceived service quality, satisfaction, and continuance intentions, whereas perceived risk had significant influence on service quality and continuance intention.

Authors	Theories adapted	Country	Major Findings
Samudra & Phadtare (2012)	UTAUT	India	The factors identified were convenience, compatibility, perception, social influence, and information.
Aboelmaged & Gebba (2013)	TAM and TPB	Dubai	Attitude and subjective norm have a positive impact on mobile banking adoption.
Chen (2013)	Diffusion of Innovation Theory, Perceived Risk, Brand Awareness, Brand Image.	Taiwan	Innovation attributes, perceived risk, brand awareness and brand image significantly influenced attitude and intention to adopt mobile banking services for frequent users.
Jeong & Yoon (2013)	Extended TAM model	USA	The factors identified were perceived usefulness, perceived ease of use, perceived credibility, and perceived self-efficacy significantly influenced behavioral intention to use mobile banking.
Chitungo & Munongo (2013)	Extended TAM model	Zimbabwe	Perceived usefulness, perceived ease of use, relative advantage, personal innovativeness, and social norms which all significantly influenced intention towards using the mobile banking.

Authors	Theories adapted	Country	Major Findings
Hanafizadeh et al (2014)	Extended TAM model	Iran	Perceived usefulness, perceived ease of use, compatibility, need for interaction, perceived risk, perceived cost, perceived credibility, and trust explained the adoption decision of mobile banking.
Singh & Srivastava (2014)	Extended TAM model	India	Compatibility, social influence, and security were the factors influenced the adoption of mobile banking.

The majority of the studies implemented well known adoption models such as TAM, TPB/DTPB, UTAUT, and IDT, while a small number of studies used other theories such as means-end approach (Laukkanen, 2007), Bass Diffusion Model (Suoranta & Mattila, 2003), Rasch measurement model (Yang, 2009) to identify the core determinants of mobile banking adoption.

2.11 Gap Analysis

Mobile banking has recently been introduced in India. The extensive review of the existing literature revealed diverse antecedents to the adoption of mobile banking. In view of the mixed results from prior studies, there is an inconclusive status regarding the mobile banking adoption studies in the literature. Many studies had conducted in both developing and developed countries to understand the customer acceptance of mobile banking. However, a limited number of studies were conducted in India; specifically, it is conducted in certain metropolitan cities (Hyderabad, Pune, and Kochi). These findings are insufficient to provide meaningful insight into predicting and explaining what factors influence the customers to use mobile banking. Past empirical studies of mobile banking adapted different theories to study the adoption intentions, which showed diverse results, which make it difficult for bankers and researchers to identify the key drivers/inhibitors of mobile banking adoption. Mobile banking is a very nascent stage in India; therefore, it is important to study mobile banking adoption,

which would enhance the diffusion of mobile banking. This shows a pressing need for developing a model, in which it explains the factors leading to the mobile banking adoption.

The existing literature revealed that there is a lack of empirical studies, which measures the current internet banking customers' perceptions towards mobile banking. It is also evident that, very limited studies conducted in India about current internet banking service quality and satisfaction. It is important to measure the satisfaction level of current internet banking consumers, to understand their willingness to use mobile banking. Existing studies adapted different scales/dimensions to determine the e-service quality of internet banking. The literature also identified that there is no consensus regarding the dimensions of internet banking service quality.

From the gaps identified from the existing literature reviewed above, lead to the inception of the present research topic under study. The inputs obtained from the existing literature of mobile banking adoption is used for the development of the theoretical model of consumer adoption of mobile banking in India. The findings from the internet banking service quality literature is used in the present study, to identify the internet banking service quality dimensions, and to identify the relationship between service quality and customer satisfaction and measuring the customer satisfaction of internet banking in India.

This chapter discussed a brief overview of consumer behavior, adoption process, services, service pyramid model, technology in service delivery, and service quality models. The study reviewed literature on e-service quality models/scales, previous internet banking e-service quality studies, prior studies on mobile banking, and identified the gaps in the past studies.