Chapter 2

Review of Literature

2.1. INTRODUCTION

The literature review section provides an insight into self-service technology (SST) and factors affecting adoption /non adoption of technology in various service contexts. Further it discusses two research domains that are relevant to the study, namely, technology acceptance theories and health behaviour models followed by a detailed review of the Theory of Planned Behaviour (Ajzen 1988 and 1991). The section ends with a description of the variables intended for extending the TPB model, with illness representation (based on Leventhal et al 1984; Self-Regulation Theory), illness acceptance, Quality of Life (QOL) dimension, long term orientation (cultural dimension) and moderator variables.

2.2 SELF-SERVICE TECHNOLOGY

Clarence Saunders in 1916, revolutionized the way services were carried out by beginning the world’s first self-service grocery store, called ‘Piggly Wiggly’, in Memphis, Tennessee (Salomann et al 2005). This idea was patented by him in 1917, and it became a huge success across USA. However the concept captured the attention of the academic community only by the latter part of 1970s. The following paragraphs explain in brief about some of the major studies that addressed the shift towards greater role of customer in service delivery.

It was Chase (1978), who first classified services into high contact and low contact depending on the level of customer interaction with the service personnel and system. It was suggested that the less direct contact the customer has with the service system, the greater the potential of the system to operate at peak efficiency. High and low contact systems design considerations were differentiated on the basis on facility location and layout, product and process design, scheduling, production planning, worker skills, quality control, time standards, wage payment, capacity planning and forecasting. In high contact systems, there is a high level of interaction between service producers and their customers.
The work of Lovelock and Young (1979) argued that productivity could be improved by bringing changes in the way consumers interact with service producers. Based on the discussion of certain service situations, they stated that there is a need for developing consumer trust, an understanding of customer’s habits and determinants of consumer behaviour, pretesting new procedures and equipment, teaching customers how to use service innovations, promoting the benefits and stimulating trial, and monitoring and evaluating performance. They also suggested that strategies like changing the timing of customer demand, involving customers more in production, and asking customers to use third parties will help in changing customer behaviour or expectations to increase productivity.

Bateson (1985), for the first time profiled self-service consumer with the help of an exploratory study. In his study, the author has analyzed consumers’ decision process when faced with a choice between a self-service option and a traditional service delivery system. Based on qualitative study and literature review, a quantitative study was carried out using a mail survey, yielding 1,200 usable samples. The scenarios (SST vs. traditional delivery) included in the study were in the context of a gas service station, bank, fast food restaurant, airport, hotel, and travel agency service. The sample was selected using a stratified random sampling of 1500 customers of three financial institutions in U.S.A. Chi-tests were used to test association between user / non-user categories and participation level. He identified dimensions like time savings, effort, control, dependence, efficiency, human contact, psycho-social and performance risk, of which time and control have shown a significant influence on choice. It was found that even without financial or convenience incentives, there will be people who will use SSTs, because they can control the service better. Participants, who have already used self-service ranked time, risk, efficiency, and control for choosing self-service over traditional service delivery option. The users were found to be not sensitive to effort, dependence, and lack of human contact, while non-users ranked risk as being the most important criterion for avoiding self-service.

A conceptual model of self-service developed by Globerson and Maggard (1991) emphasized the potential use of self-service and its impact in a service process. The researchers discussed the need for understanding consumer demand, organizational ability to offer self service activities and environmental factors that affect both
consumer and server when estimating the impact of introducing self-service into a service process. Accordingly seven major factors which affect consumer preferences for using self-service are convenience (described as accessibility of the self-service facility to targeted customers), time savings, self-control, money savings, self-image, risk and self-fulfilment. Four factors were included under environmental sector-governmental regulations, trade constraints, unions, and workforce availability and under organizational sector; organizational capability was proposed to be significant. It is dependent upon the firm's organizational position (function of the firm's geographical location/dispersion, its size, growth potential and current market share) and its technical ability to introduce and maintain a self-service system.

Bitner et al (2000) pointed out that the conventional way of considering the customer-employee interface as a basis for marketing services have been affected by the introduction of self-service technology. They discussed with the help of a technology infusion matrix framework how successful application of technology can improve the service encounter. Accordingly, three key drivers of service encounter dis/satisfaction suggested were customization/flexibility, effective service recovery, and spontaneous delight. With the help of a critical incident study, the authors have found three major categories leading to satisfaction (helping a customer in an immediate or troubling situation, relative advantage, novelty of the technology and its ability to perform the service correctly) and four major factors leading to dissatisfaction (technology failure, process failure following the SST encounter, poor SST design and customer driven failure).

The views of Parasuraman (1996) and Bitner et al (2000) was supported by Anitsal et al (2002 a, b) and stated that the infusion of technology and its effect on service can be viewed in the context of the relationships between employee, customer and technology components, providing options for either full service or self-service (technology based full-service delivery option, technology based self-service delivery option). An extension of the above study by the same researchers has also discussed the transformation of service options from full service toward technology-based service from the customer's point of view. They identified six service options, namely, full service, joint production, self-service, technology based full service, technology based joint production, and technology based self-service. They have
explained self-service encounter as customer responding to a service system in the absence of a service employee and technology based self-service as customer to-technology interaction without any contact employee.

Self-service as a model and a market trend has gained significant momentum in the last decade across a variety of service industries, as consumers increasingly accept and often prefer self-service to assisted service (Kasavana 2008). Berry and Lampo (2000) stated that “self-service can enhance the service’s value for customers. By assuming the producer role, customers move from a reactive to a proactive status and often can gain control over the timing and speed of service delivery.” Technology has undoubtedly altered the landscape of service industry by changing the ways of consumer interaction as well the way of service delivery provided by organizations (Meuter et al 2005).

2.3. CLASSIFICATION OF SELF-SERVICE TECHNOLOGY

The term ‘Technology based Self-service’ (TBSS), coined by Dabholkar (1994) denotes different types of self-service based on technology or made possible by a variety of technologies. Six years later, Meuter et al (2000) first used the idiom ‘Self-service Technology (SST)’, to stand for technological interfaces that enable customers to produce a service independent of direct service employee involvement’. However, the terms ‘Technology based Self-service (TBSS)’ and ‘Self-service Technology (SST)’ have been used interchangeably, as both terms gained wide acceptance in subsequent research carried out by other authors.

Some of the examples of TBSS/SST alternatives across diverse service industries consist of automated teller machines (ATMs), electronic kiosks (used for checking baggage/boarding pass, electronic blood pressure checking devices, automated car rental machines, touch free electronic car washers, automated telephone services, self-checkout systems at retail stores, electronic self-ordering systems at fast-food restaurants, service computers with internet connection at airports, vending machines, transaction via the internet, internet shopping, in-store kiosks, interactive voice-based services and point-of sales interactive devices (Dabholkar 1994, 1996; Kotler 2000;
Meuter et al 2000; Harler 2002; Wright 2002 and Meuter et al 2003). According to Kasavana (2008), the three most popular self-service technology (SST) platforms in today’s world are vending, kiosk and web applications.

The growing research in the field of SSTs brought the need for the development of a classification system. The need for a classification of SSTs by interface and purpose was reiterated when Curran and Meuter (2005) and Walker and Johnson (2006) tested adoption factor models across different SSTs and reported that the influence of the tested adoption factors varied by SST type.

Dabholkar (1994) have classified TBSS based on three dimensions, namely, (1) who delivers the service – is it the employee or the customer who operates the technology; (2) where is the service delivered? - is it at the service site or at the customer’s home or workplace; and (3) how is the service delivered? - is it through direct contact (Here user can see and feel the technology of the company) or indirect contact (Here user can only reach the technology over the phone or by voice).

Anselmsson (2001) categorized TBSS operations based on Dabholkar’s (1994) classification into four major groups of TBSS delivery systems. Accordingly it was classified as (a) At service site with direct contact - customer goes to service site and uses technology to perform service, (b) At customers’ site with direct contact - customer uses technology from home/work to perform service (c) At service site with indirect contact - customer goes to service site and uses automated telephone system to perform service and (d) At service site with indirect contact - customer calls automated telephone service from home/work to perform service.

Meuter et al (2000) developed a classification of SSTs which divided SSTs along two dimensions: interface (telephone/interactive voice response, online/internet, interactive kiosks, video/CD) and purpose (customer service, transactions, self-help).

Dabholkar and Bagozzi (2002) have segmented TBSS into ‘on-site’ and ‘off-site’ options. Some of the ‘on-site’ options are touch screens in department stores, information kiosks at hotels, self-scanning in the grocery store and libraries while the ‘off-site’ technology options include telephone and online banking, and shopping on the internet. An alternative classification is provided by Forbes (2008) who divided
SSTs in two groups – Internet and non-Internet SSTs, suggesting that the two types have numerous differences which need to be understood by marketers.

Cunningham et al (2008) presented a different viewpoint by researching how consumers view SSTs and classified with 11 dimensions namely, physical product component, customer-employee contact, production of service is separable/inseparable from consumption, risk level, switching barriers, service is performed on person/object, relationship between service provider and customer (formal/informal), process of service delivery is continuous/discrete transactions, customization of service, the contact employee’s judgment on choice of service provided and convenience of receiving the service. Two main dimensions along which consumers classed SSTs were customized-standardized and separable-inseparable.

2.4. SST–PERPECTIVE OF SERVICE PROVIDERS AND CUSTOMERS

Successful implementation of SSTs is expected to benefit service providers by reducing operational costs, increasing customer satisfaction and loyalty, (Bitner and Meuter 2002 and Tanya and Nicola 2006) extending business hours, better management of firm’s capacity, enable customization and utilizing consumer resources to produce the services (Curran and Meuter 2007), allowing staff to be relieved from routine duties to concentrate on service delivery aspects where personal touch is more valuable (Lee and Allaway 2002) and as a facilitator for competitive advantage (Meuter et al 2005). Some of the vital issues that the service provider have to take care of are linked to investment expenses, staff and consumer training (Bitner et al 2002 and Lee and Allaway 2002) and dealing with consumer complaints and service recovery (La and Kandampully 2004).

Bitner et al (2002) and Meuter et al (2003) affirmed that SSTs gives customer’s independence and control over their service encounters. Bitner et al (2002) elucidated that customers use SSTs when it bails them out of difficult situations; is found to be better than the interpersonal alternative, and when the SST actually provides the service that it was supposed to. Similarly, the motive for choosing self-checkouts over
personal assistance in the retail environment are speed, providing more choices of payment, greater privacy and control, and its convenience aspects (Alpert 2008).

However, need for a radical change in consumer behaviour (Curran and Meuter, 2007), need for personal interaction (Dabholkar et al 2003; and Lee and Allaway 2002), requirement for higher levels of consumer participation and responsibility (Lee and Allaway 2002), and discomfort with technology (Bobbitt and Dabholkar 2001) were some of the factors that were found to cause avoidance of SST usage by customers.

2.5. ADOPTION OF TECHNOLOGY - A DISCUSSION

Kotler (2003) have defined adoption as an individual’s decision to become a regular user of a product or a service. The following paragraphs highlights the studies carried on SST adoption/non adoption in a variety of service contexts. Further it is also expected to give an insight to the factors affecting adoption.

2.5.1 TECHNOLOGY ADOPTION IN MULTIPLE SERVICE CONTEXTS

A study by Zeithaml and Gilly (1987) tried to understand the acceptance of technologies (ATMs, scanner equipped grocery stores, and electronic fund transfer-EFT) among elderly consumers (aged 65+), and non-elderly consumers (aged 18-64) in USA. Elderly attach significant importance to safety and convenience. The elderly were much more enthusiastic about EFT (Electronic Funds Transfer) than ATM and adopted grocery scanners passively /with least resistance. For both groups, adoption/non adoption of scanner remain passive, which means that respondents choose stores for reasons unrelated to technology. ATMs was adopted by a small group of elderly consumers, and the reason cited was convenience, while EFT adoption was taken up by a greater percentage, as they cited safety as an added advantage, apart from convenience. For non-elderly adopters, convenience mattered more than safety with respect to ATMs, and EFTs, while resistors were sceptical of technology and wanted the customary transactions.
Walker et al (2002) tried to understand the reasons for consumer adoption/rejection of a technology facilitated means of service delivery. They hypothesized that individual capacity and willingness will influence technology adoption and technical reliability, perceived relative advantage, individual needs fulfilment, perceived risk, and desire for control were expected to moderate the willingness to adopt. They concluded that willingness and adoption (actual usage) are highest when aided by perceived higher capacity, relative advantage, capacity, satisfactory technology reliability, a low level of perceived risk and need for personal contact. They also concluded that the moderation effect need not essentially progress in the liner direction – an individual with a high level of willingness to adopt SST but their capacities are low and vice versa. They identified four clusters–People–People Pragmatists, Techno-Waries, Techno-Beneficiaries and Techno-Phobes. ‘People–People Pragmatists’ are classified as willing users of technology facilitated services, with an above average preference for human contact. They perceive only average benefits from technology. ‘Techno–Waries ‘constitute the group which sees benefits in technology, but due to the perceived inability are unwilling users. ‘Techno-Beneficiaries’ are able and willing users of technology and detest human contact, while ‘Techno-Phobes’ is at the other end of the continuum.

Sneath et al (2002) examined the relationship between gender, risk assessment and likelihood of preference for self versus full service alternatives. Gender based differences in consumer perceptions of risk were found to influence the self versus full service decision. The study showed that men are more concerned with risks associated with psychological issues, are likely to make decisions based on objective dimensions of risk. Women are likely to consider both objective and subjective components of risk. Men are likely to consider whether or not they can perform the function or if it is consistent with their self-image, while women are likely to consider how their action will be perceived by others. Those who chose the self-service option are shown to evaluate the psychological risk of both service alternatives, while those who chose the full service option are shown to evaluate the psychological risk of only the self-service option.

Lin and Hsieh (2007) studied how technology readiness (TR) influences customers’ perception and adoption of SSTs. The SST usage experience included transportation
services offered by airlines, subways and trains (e-reservation, voice reservation system and kiosks), financial services (ATM, internet or mobile banking, interactive phone banking), government and cinema services. The researchers explored the relationships among TR, perceived service quality, satisfaction and behavioural intentions toward SSTs. It was found that increased customer TR leads to higher perceived SQ and favourable behaviour intentions when using SSTs. Higher perceived service quality is more likely to lead to satisfied customers who have favourable behavioural intentions regarding SSTs. However, results did not support the predicted positive relationship between TR and SST satisfaction.

Ponder et al (2006) examined two distinct decision-making styles – salesperson assisted and self-service assisted service encounters. SST encounters discussed were internet-related purchases, pay-at-the pump gasoline purchases, self-service grocery and retail checkouts, and automated telephone-ordering purchases. It is found that the biggest motivating factor for choosing self-service was convenience, followed by confidence in their decision-making skills and non-availability of the products in traditional stores. Other benefits of self-service cited by respondents were ease of use, time-saving aspects, the ability to comparison shop and research products before purchase, no pressure or hassles from salespeople, lower prices, the ability to shop without having to deal with crowds or wait in lines, and a larger selection of products from which to choose. In both salesperson assistance and self-service situations, the consumer was found to look for some aspect of convenience – either as a motivation for choosing a particular consumer decision-making style or as a benefit of that style.

Oyedele and Simpson (2007) attempted to study the effect of specific consumer control-related characteristics on the inclination of consumers to use SSTs, based on earlier studies which emphasized on the individual characteristics-attitude–behaviour intention link. The researchers tested five control-related inherent consumer traits (autonomy, locus of control, self-efficacy, technology anxiety and time pressure measures) in affecting the consumer trial of SSTs. in three contexts considered with varying check-out tasks and relevance were the university library, shopping (Wal-Mart) and a hotel. The significance of context in determining consumer characteristics that influence SST usage is again reiterated by this study. In this study, only technology anxiety had a significant effect on the student sample’s SST usage in
every context while significant differences between SST users and nonusers in other study variables seemed to depend on the context. SST users were significantly different from nonusers in both dimensions of external LOC in the shopping context and in the chance, goal attainment, and self-efficacy in the hotel context. Time pressure had no significant effects on the SST usage decision in the contexts under consideration. It was established that in spite of a need for control and achievement, highly techno phobic students and those with an enduring attitude that all events in life are preordained possibly will be more inclined to human interactions in service encounter.

Reinders et al (2008) explored the impact of forcing consumers to use TBSS. The researchers adopted an experimental design, and the treatments included were forced use/no choice, limited choice and full choice among all the three service modes. For buying a ticket the service modes discussed were traditional ticket office (full service), ticketing machine (on-site TBSS), internet (off-site TBSS) and for obtaining travel information traditional information desk (full service), touch screen monitor (on-site TBSS), internet (off-site TBSS) were considered. The results revealed that having no choice adversely affects attitudinal and behavioural consequences, but that offering an increasing number of choice options does not linearly contribute to more positive attitudes and behavioural intention. Forced adoption lead to negative attitudes toward using the TBSS, towards the service provider and indirectly leads to adverse effects on behavioural intention. Offering interaction with an employee as a fall-back option helped to offset the negative consequences of forced use. Previous us experience with any TBSS leads to more positive attitudes toward the offered self-service, which can offset the negative effects of forced use to some extent. Attitudes partially mediate the relationship between perceived freedom of choice and word-of-mouth intentions and fully mediate the relationship between perceived freedom of choice and switching intentions. Similar to earlier studies, there existed gender difference in their attitude and adoption of TBSS.

Chen et al (2009) tried to predict and explain an individual’s continuous use of SSTs and evaluation of SSTs service, based on the concepts of technology readiness (TR), technology acceptance model (TAM), and theory of planned behaviour (TPB). The study covered a wide range of SST providers, including e-reservation, kiosks, ATM,
internet or mobile banking. Using SEM techniques, they identified that consumers’ satisfaction significantly influences continuance intention (CI) and that TAM variables, perceived usefulness (PU), perceived ease of use (PEOU) as well as subjective norm (SN), and perceived behavioural control (PBC) from TPB model significantly influences satisfaction. The TPB variables, subjective norm (SN) was a stronger indicator of PU and perceived behaviour control (PBC) has a significant influence on CI. Optimism and innovativeness are also the significant motivators of satisfaction. However TR’s inhibitors (discomfort and insecurity) did not have any significant negative influence on CI towards adopting SST services.

The role of global self-identity (cosmopolitanism/parochialism and global/local identification) and self-regulation (promotion and prevention focus) in predicting technology readiness (TR) and the orientation toward technology usage, in USA and China was investigated by Westjohn et al (2009). The theoretical base for this study was the social identity model of motivation (Oyserman 2007). The study found that cosmopolitanism, global identification and promotion focus are all positively related to technology usage, while prevention focus is negatively related. Promotion focused individuals may enjoy a feeling of accomplishment by learning how to use new technology, while prevention focused individuals may experience a fear of failure or embarrassment.

A Chinese study by Zhang et al (2013) to understand the adoption of SSTs segmented it into financial and specialty SSTs based on product function, ATM and ABM (automated boarding machines). The research results showed that the perceived ease of use, perceived usefulness, self-efficacy, perceived enjoyment, facilities conditions and technical readiness of ABM and ATM have a positive significant effect on the adoption behaviour. Privacy, security and perceived risk showed a negative effect on the adoption behaviour, with greater significant impact for adoption of ATMs. This showed that the usage context had a profound influence on the adoption behaviours.
2.5.2 TECHNOLOGY ADOPTION IN BANKING CONTEXTS

The adoption of SSTs by customers of retail banking in New Zealand was studied by Marr and Prendergast (1993). The authors identified three variables encouraging adoption, namely, time convenience (the ability to perform banking transactions at a time which suits the customer), place convenience (the ability to perform banking transactions in a location which suits the customer) and simplicity of use. Preference for human interactions and privacy were cited as discouraging consumer acceptance of technology.

Thornton and White’s (2001) study to understand customer orientations and usage of financial distribution channels found that self-service distribution channels have higher current and future usage amongst those customers who have favourable attitudes towards convenience, change and technology, while customers with a favourable attitude towards service prefer human teller interaction.

Gerrard and Cunningham (2003) based on characteristics of diffusion identified by Rogers (1962) tried to identify characteristics of internet banking adopters. Based on exploratory interviews with both adopter and non-adopters group found that characteristics identified by Roger were not one-dimensional in nature in this study. The dimensions: - complexity (pure complexity and skills associated with PC usage) and relative advantage (social desirability, convenience and economic benefits) were shown to encompass more than one dimension and only compatibility was uni-dimensional in nature.

Curran et al (2003) attempted to understand influence of attitudes towards intention to use SST in the context of 3 banking technologies - ATM, bank by phone and online banking. Attitudes related to interpersonal service delivery (attitudes towards staff and a global attitude toward the service firm) and attitudes related to technology (attitudes towards a specific SST and a global attitude toward the SSTs) were considered for this study. BI was found to be a convergence of multiple attitudes and that attitudes related to interpersonal service delivery will influence attitudes related to technology. Further, based on the customer estimation of their banking transactions using SST interfaces, heavy SST users were found to rely more on attitude towards specific SSTs, while light SST users relied heavily on global attitude toward SSTs.
Eun-Ju Lee et al (2003), based their conceptual model on theory of diffusion of innovation and proposed that technology adoption is affected by access to innovations in the first stage and also by customer perception of the innovation characteristics relevant to technology based service innovation (perceived benefits of technology, reliability, trialability, complexity, security, complexity and need for human interaction) and socio economic characteristics (age, education, income and PC at home). Perceived innovation characteristics have significant effects on consumer likelihood of adopting both innovations. Socio economic variables are highly significant predictors of consumer access to computer banking. Complexity is negatively associated with consumer adoption of e-banking and observability was found to be insignificant. In the above study, observability was not found to have a positive effect on customer adoption.

Mattila et al (2003) explored the reasons for adoption/non adoption of internet banking among mature customers in Finland. Majority of mature customers belong to the late adopter group. However more than 45 per cent of the sample perceives themselves as younger in age and outlook, more in control of their lives, and more self confident. They will try new products, but they will try them for different reasons than the younger market (if it can meet a personal, specific need). For non-adoption, the reasons cited were lack of personal interaction, technology anxiety and security issues.

Kolodinsky et al (2004) examined the linkage between the characteristics that describe the adoption of new innovations (based on TAM and Diffusion Innovation model) and BI of 3 e-banking technologies: automatic bill payment, phone banking, and PC banking in USA. The focus of the study was on the adoption continuum, ranging from those who have already adapted to those who, in all likelihood, will never adopt selected e-banking services. It was found that relative advantage and compatibility were significant and positive for all e-banking products. Trialability was not significant for any of the three e-banking technologies. Simplicity was significant and positive only for PC banking. Observability was significant only for phone banking. Respondents who were involved with other electronic banking technologies were significantly more likely to use each of the three e-banking technologies. Further, age and education were significant for phone and PC banking, while marital
status and gender was significant only for phone banking. Being a minority was significant only for ABP. Therefore, e-banking technologies cannot be aggregated into a single category, when planning marketing efforts.

McPhail and Gerard Fogarty (2004) examined the mature consumer (50+) market, with respect to the level of adoption and usage of self-service banking technologies (SSBTs), in Australia. There is a considerable group of mature consumers across all age groups using a variety of SSBTs. The non-user segment and low user segment displayed a level of innovation resistance to some or all SSBTs. Some mature consumers expressed willingness to change to more innovative SSBTs like telephone banking and internet banking while some stopped using a SSBT and did not adopt any other form of SSBT.

A study conducted by Curran and Meuter (2005) compared three self-service technologies: automated teller machine (ATM), telephone banking/banking by phone (BBP), and online banking (OLB) for assessing factors that contribute to consumer acceptance of SSTs. They extended the TAM model by adding two additional variables – perceived risk and need for interaction and proposed that attitude toward an SST will impact the overall intention to use the SST. It was found that adoption varied widely between technologies used to deliver comparable services. Ease of Use (EOU) was a significant predictor for attitudes towards ATM, but not for BBP and OLB. Usefulness is a significant predictor for attitudes towards both ATM and BBP, but not for online banking. None of the three models provided any evidence to support the significance of need for interaction as an antecedent belief to attitudes toward any of the technologies included in this study. In the case of OLB, the only significant path from an antecedent belief was from risk to attitude. For online banking - a relatively new technology, all the antecedents, except perceived risk were insignificant in influencing attitude.

Lee et al (2005) investigated the heterogeneous nature of the non-adopter category (prospective adopter and persistent non adopter) in the context of internet banking. While current adopters perceive convenience and quick service as important service attributes, persistent non-adopters rate security and size of bank to be of importance. Prior internet purchase experience was found to have a very significant effect in differentiating current adopters from persistent non-adopters. Prospective adopters
tend to be heavier users of ATM, phone banking, computers for work, and value convenience than persistent non-adopters. Nonetheless, there was no significant difference in perception of risks between the two groups. There was no significant difference between current adopters and prospective adopters with respect to compatibility and experience with technology. Prospective adopters were found to be more concerned with transaction security and monetary benefits when choosing an internet-based banking service.

Gerrard et al (2006) exploratory study on factors influencing non-adoPTION of internet banking among banking consumers in Singapore found that adopters saw SST usage as more convenient and exhibited innovation characteristics as explained by Rogers. Content analysis identified perceived risk, lack of perceived need, lack of knowledge about the service, inertia, inaccessibility; lack of human touch, pricing concerns and IT fatigue as factors influencing non adoption. Females and the less-well educated customers were less likely to become internet banking users.

Curran and Meuter (2007) examined factors that influence consumer decision to adopt SSTs in banking sector vis-à-vis service provided by staff in US context. The authors proposed separate and distinct attitudes for this study – attitude towards specific targets (banking SSTs) and staff and generalized attitudes – overall attitudes toward the service provider and the overall attitude towards SSTs. They also studied the relationship between attitudes, anticipated outcomes to behavioural intention (BI) for changing existing behaviour. Three anticipated outcomes discussed in the study are utility (potential rewards or punishment resulting from performing the behaviour), social acceptance (approval or disapproval of others to adopt and use product and service by an individual) and enjoyment. Anticipated outcomes with attitudes were found to be better predictors of intentions and fun aspect, more important than utility and social acceptance in influencing adoption of SSTs. The study suggested that attitude does not have a significant influence on BI, in the context where a change in behaviour is solicited.

A comparative research of Estonian (emerging market) and Swedish (established market) customers’ use of online banking by Nilsson (2007) tried to determine the demographical segments of SST users and whether this differs across cultures. Age,
gender, education, and income were considered for the study. The profile of the SST user (internet banking) in Estonia was that of a young, well-educated male with high income, while in Sweden the SST users constituted a heterogeneous group. In Estonia, customers could be clearly demarcated on demographic variables, while in Sweden; the influence of age, gender, education and income groups was not very marked.

Ding et al (2007) examined factors contributing to adoption of SST in the context of online financial services. Customers who prefer self-service, both online as well as with a high-involvement service prefer personal control, time and cost saving and avoidance of personal contact in service. Self-service users and professional service consumers are price sensitive and least interested in promotion related special offers. They found that self-service users are at their early thirties to late forties, professional service customers in their 40s-50s and the hybrid users (using both services) are in their 20s-30s. Females were said to be more risk-averse than males.

Shamdasania et al (2008) collected 240 completed surveys from internet banking users registered with the website of a British consumer banking corporation. Perceived control was identified as the most significant predictor of a consumer’s evaluation of service quality.

Berger (2009) study tried to understand the factors influencing the adoption of SST for pro-active sales in European retail banking with emphasis on effects of personality traits, relationship characteristics and previous online banking usage. They extended the TAM model by incorporating moderating effects of technology readiness dimensions (optimism and innovativeness) need for interaction and customer relationship characteristics (scope- number of products purchased, scale – total sum of assets). The TAM model was used to explain the attitude – behavioural intention (BI) link. The moderating effect of optimism (strengthening effect) on perceived ease of use (PEOU)–attitude relationship was insignificant in this study, while the moderating effect of innovativeness (strengthening effect) was significant. The moderating effect of need for interaction (attenuating effect) on perceived usefulness -attitude was also found to be significant. The characteristics of the customer relationship both have an effect on the same relationship and moderate the influence of PU on attitude. When the sub samples were studied (online banking users and non –online banking users),
the importance of the direct effects of PEU exceeds PU in the non-adopter sub-sample, while PU is slightly more powerful with the adopters and even more significant. The customer relationship characteristics did not have any further moderating effect with respect to the online banking adopters’ sample. The moderating effect of innovativeness remains strong and significant in both subsamples.

Haytko and Simmers (2009) investigated the effects of human interaction (tellers) versus interactions with technology (ATMs, online transactions) in overall customer satisfaction with banking services. The convenience of online banking has displaced the importance of human interaction among the student sample. However males are more influenced by teller transactions and is an important determinant in overall service satisfaction.

Sripalawat et al (2011) studied the acceptance of mobile banking in different countries by combining the effects of positive and negative factors that are expected to determine the acceptance of this SST. The researchers used an extended TAM as a research model, which included technology-specific constructs such as device barrier, perceived risk and perceived financial cost. Key factors of m-banking adoption in every country included in the study were found to be perceived usefulness (as a positive factor) and lack of information (as a negative factor).

Yu (2012) studied the acceptance of mobile banking through an extended UTAUT framework. Use intention and facilitating conditions were found to strongly determine the usage behaviour and gender and age had significant moderating effects.

Yousafzai and Yani-de-Soriano (2012) studied actual internet banking behaviour of British customers’ using an integrated model of TAM and TRA. The perceived usefulness-intention link was found to be stronger for young males while perceived ease of use–intention link was stronger for older females. Younger males exhibited high levels of innovativeness whilst older females expressed high levels of discomfort and insecurity.
2.5.3 TECHNOLOGY ADOPTION IN ONLINE CONTEXTS

Eastlick and Lotz (1999) studied characteristics and attitudes of potential innovators and non-adopters, in the context of an interactive electronic shopping medium. Differences existed among three adoption intent groups (innovators, early adopters and followers). Similar to Rogers (1995) findings, the perception of innovation characteristics were the strongest predictors of adoption. Potential adopters perceived interactive teleshopping as easy to use, attuned to their shopping needs and lifestyles and expressed positive opinion of its advantages over traditional methods of shopping. In contrast, potential non adopters did not feel that interactive electronic shopping will provide either relative advantage or compatibility and regard limited trial of interactive teleshopping as difficult and a major financial expense.

A study by Lee and Allaway (2002) attempted to understand the influence of personal control dimensions and the effect of purposeful manipulation of personal control on perceived risk (PR), perceived value (PV) and consumer adoption intention. The dimensions of personal control studied were predictability, controllability and outcome desirability and they employed 2x2x2 factorial design and a scenario method approach with a student sample (n= 240). The study found that major association between personal control and the adoption process. The results revealed that the role of personal control in reducing consumer’s PR, augmenting the PV of SST, and technology acceptance. Outcome desirability was found to have a significant effect on PR, PV, and purchase intention of the innovation. The researchers noted that, with increased perception of controllability and outcome desirability; respondents expressed a higher adoption intention.

Eriksson and Olsson’s (2002) study on online booking of trips found that customers perceived this technology interface as comfortable and timesaving alternative to traditional travel agent services, although different age groups showed some disparity in their views.

Monsuwe et al (2004) proposed a framework to understand attitude of consumers based on TAM towards online shopping and their intention to shop on the internet. Apart from the factors identified in TAM model, consumer traits (expertise, self- efficacy and need for interaction), situational factors (time pressure, lack of
mobility, geographical distance, need for special items and attractiveness of alternatives) product characteristics (lack of physical contact and assistance), previous online shopping experiences and trust in online shopping were also identified in the conceptual model.

An online survey was carried out by Ho and Ko (2008) of which nearly 60 per cent of the respondents were males to study about adoption of internet banking. It was found that customers are willing to use internet banking when customer value (CV) and customer readiness are high.

Marler et al (2009) study on factors enhancing user acceptance of employee self-service (ESS) technology both before and after implementation, found that positive attitudes towards SST usage and support from subjective norms in the organization. The model discussed in the study incorporated TAM model variables PU and EOU-Attitude–BI linkage, subjective norms-BI linkage and POS (perceived organizational support), managerial pressure (normative belief) and perceived conditions) as other explanatory variables. In the post implementation phase, it was proposed that perceived usefulness, managerial pressure, SN, perceived resources will have greater significance than EOU on adoption. It was found that perceived usefulness (attitudinal beliefs) and managerial pressure (normative beliefs) was significant in pre and post phases. POS was important as a moderator in enhancing normative beliefs (managerial pressure) in the post implementation phase, but no direct linkage between POS-Attitude was observed. Consistent with Decomposed TPB, attitudes, SN, and perceived resources predicted BI in pre implementation phase. In both phases of the study, normative beliefs (managerial pressure)-SN–BI linkage was found significant.

AlGhamdi et al (2012) study about online retailing from retailer’s viewpoint in Saudi Arabia identified ambiguous e-commerce legislation and a lack of e-commerce experience as inhibiting factors. The enablers were ‘provision of trustworthy and secure online payment options, government support and assistance for e-commerce, development of strong ICT infrastructure and educational programs for potential customers and building the awareness of e-commerce in the country.’
2.5.4 TECHNOLOGY ADOPTION IN RETAIL CONTEXTS

Dabholkar and Bagozzi (2002) investigated the moderating effects of consumer traits (inherent novelty seeking, self- efficacy with respect to technology, self-consciousness and the need for interaction with an employee) and situational factors [perceived waiting time and social anxiety (through perceived crowding)] on the evaluation and use of technology based self-service. The core attitudinal model for TBSS (Dabholkar 1994), an extension of TAM model is considered as the basis for this study. Student sample (n= 392) were administered a scenario setting (use of touch screen for ordering in a fast food restaurant). SEM was used to test the core attitudinal model and for each moderating variable, the core attitudinal model was tested for high and low groups again using SEM. The results revealed that ease of use (EOU), fun or enjoyment in TBSS is critical, if consumers have to encounter waiting lines or crowded conditions that could cause social anxiety. Higher self- efficacy attenuated the relationship between EOU-attitude. Greater inherent novelty seeking strengthened relationship between fun-attitude and attenuated the relationship between performance – attitude and attitude–BI. Higher need for interaction strengthened relationship between fun- attitude, attitude–BI and EOU-attitude. Increased self- consciousness strengthened relationship between performance–attitude, attitude–BI and fun-attitude. The researchers stated that EOU is very important in a target market which is low in inherent novelty seeking and high in self-consciousness. The fun aspect needs to be promoted in case of a target group that is high in inherent novelty seeking, self-efficacy, self-consciousness, and exhibits a high need for interaction with employees. In the case of situational factors, greater perceived waiting time strengthened the relationships between EOU-attitude, fun-attitude and attenuated attitude-BI relationship. Higher social anxiety strengthened the relationships between EOU-attitude, fun-attitude and attitude-BI relationship. The authors noted that EOU and fun/enjoyment needs to be stressed by marketers, if consumers are faced with long waiting lines or crowded conditions that could cause social anxiety. It is very crucial to understand whether the consumer traits and situational factors discussed in this research work brings out the same results in a different SST context, different industry, forced-volitional use, new technology-familiar technology, and different culture context.
A study on adopters and non-adopters of self scanning technology in retail context was studied by Dabholkar et al (2003). They also tried to understand reasons for consumer shopping preferences between SSTs and traditional checkouts. The grocery store used as setting in this study provided both traditional and SST service delivery options. A combination of survey methodology and quantitative analysis were used to examine the relevance of factors discussed in earlier studies. In addition, structured interviews and detailed content analysis were carried out to identify factors affecting consumer usage or non-usage of the self-scanning checkout. The study also looked into perceived attributes of the self-scanners, situational influences, and consumer differences. Consumer sample included 101 respondents shopping throughout the store and 49 at the self-scanners. Their quantitative analysis findings point out that adopters compared to non-adopters perceive the TBSS as easier to use, offers greater control, and is more reliable and enjoyable. Speed was very important to both the groups as shown in content analysis, but was not found to be a discerning aspect in the quantitative study. A factor mentioned most by respondents was convenience which was however not mentioned in the theoretical framework. It was also found that to avoid interaction with employees or because of favourable attitudes towards technology in general, consumers planned to use SST. Under crowded conditions (situational factor) consumers viewed self scan as faster, based on quantitative analysis. The content analysis brought into open the following situational variables as having an effect on TBSS adoption in a retail setting - number of products purchased, importance of service staff assistance, variety of payment options. Consumers that disliked self scanning expressed a sense of having a right to be served and viewed self scanning as involving too much effort. In the context of other technology based service options (ATMs and internet shopping) younger males showed a higher preference for the same. One of the other findings mentioned in the study was that if consumers exhibited favourable attitudes towards using technology in general, it will lead to favourable attitudes to TBSS options.

Weijters et al (2007) tried to identify a process model to understand the antecedents and consequences of SST usage by customers in an in-store retail setting, based on the literature on the adoption of innovations and the work by Dabholkar and Bagozzi (2002). The researchers investigated whether SST usage has an impact on customer satisfaction (considered as pre-economic outcome), the effect of SST on the total time
those customers spend in-store, identify determinants of attitude, explore attitude–
usage behaviour linkage and the moderating influence of demographics (education
level, age, and gender) on the SST-acceptance process. A grocery retail chain in
Western Europe, which provided self scanning option was selected for the study
and the sample size (n=497) consisted of customers having loyalty card. SST
attributes taken into account as direct antecedents of SST adoption in the study
were perceived usefulness, perceived ease of use, reliability, fun associated with
SST usage and newness. SEM analysis was carried out. The results showed that
perceived usefulness (refers to the benefits customers associate with using the SSTs.)
established the chief explanatory power on attitude as against Dabholkar and Bagozzi
(2002) study who suggested that the perceived usefulness dimension is not
relevant for TBSS. The advantage of SST in terms of perceived waiting times is
realized only when buying many items and also in crowded conditions. Perceived
waiting time negatively affects satisfaction with the shopping trip and this effect is
stronger for SST users than for nonusers of the SST. Nevertheless, the actual total
time spent in store is not affected by SST usage or non-usage, even when buying
many products in crowded conditions. The moderating effect of education level
and gender of customers affect the importance that they attach to certain
features of SSTs when evaluating the technology. Perceived newness has a widely
varying effect on attitudes toward SST depending on the level of education of the
customers. Age did not show any moderating effect with respect to attitude–behaviour
link. In this study, hedonic dimension as an SST attribute is significant in affecting
attitudes towards SST.

Elliott et al (2008) compares Chinese and American consumers on their propensity to
use SST in a retail setting and on their levels of technology readiness (TR), identified
that American consumers exhibit higher level of optimism, innovativeness, and a
greater propensity to use SST for retail transaction than Chinese consumers. This
study was conducted using student samples from both the countries (China n=237, US
n=231). Chinese consumers showed a higher level of discomfort and insecurity
towards using technology. For US consumers, insecurity, optimism and discomfort
were the important factors in predicting likelihood of TBSS adoption. Out of the
Technology Readiness Index (TRI) dimensions, only two (insecurity and discomfort)
were significant in Chinese case. It was pointed out that retailers need to continually
assess consumers’ propensity to accept and use the new self-service technology that they offer and to take into account cultural differences as a crucial factor.

A study by Dean (2008) explored the effect of age on attitudes toward and use of technology in the context of self-service checkout in a retail format. They compared young and old consumers with regard to their confidence level in technology usage, need for human interaction, and experience with SSTs. A convenience sampling of consumers in a metro area in US, approached using intercept method were given structured questionnaires, yielding 718 usable responses. Chi-Square analysis and cluster analysis were carried out in the study. Cluster analysis was able to identify three groups and was found to cut across age categories. One group which was extremely confident in using SSTs, did not mind lack of human interaction, and opted for SSTs when available, representing predominantly the younger age group. They viewed SSTs as beneficial for both organization and customers. Another group consisted of respondents whose opinions were neutral and a third group with respondents predominantly above the age of 49+, exhibited an exact opposite view of their younger counterparts. They felt that SSTs were used primarily to cater to corporate self-interest.

A study by Chiu et al (2010) in the context of voluntary kiosk usage intention, among Taiwanese public, using UTAUT model (Venkatesh et al 2003) found that consumer’s usage intention is formed by facilitating conditions (FCs), performance expectancy (PE), social influence (SI) and effort expectancy (EE) listed in their order of importance. Survey conducted among Taiwanese students using a stratified sampling method yielded a usable sample size (n=387). The respondents were grouped into early adopters (people having used the kiosk) and potential adopters (people who have not used kiosk before). A between-groups analysis identified that significant distinction is present among potential and early adopters with regard to overall perception towards kiosks. Early adopters demonstrate higher levels of PE and EE, and are more strongly guided by SI and FCs, as compared to potential adopters. The study did not consider the moderating influence of demographic variables as cited in UTAUT model, and the moderating effect of technology readiness (TR) on BI could not be established.
Close and Kukar-Kinney’s (2010) study among a national online sample in USA found that virtual carts are used for ‘securing online price promotions, obtaining more information on certain products, organizing shopping items, and entertainment and also acts as a wish list for possible purchase.

Hung et al (2012) study found that, trust is the most crucial factor in the context of m-shopping continuance. Perceived usefulness was found to not influence the continuation intention.

Jackson et al (2014) reiterated that speed, quantity of items to be purchased, need for human contact influenced use of self-checkout machines in U.K. retail context. Further, extrovert personality types were more likely to make use of self-checkout machines than introvert personalities.

2.5.5. Studies detailing Technology Adoption in Healthcare Contexts

Hebert and Benbasat (1994) examined the adoption factors of point-of-care technology in a health care situation (a nurse adopting bedside terminals), from the service providers’ view point. The variables that were significant in predicting the intent to use were compatibility, relative advantage, and result demonstrability (attitude factors) and nursing director (subjective norm).

Meuter et al (2005) explored the key factors that influence the initial SST trial decision, specifically focusing on actual behaviour in situations in which the consumer has a choice among delivery modes. The researchers divided the predictors of trial into mediating variables (consumer readiness) and antecedent predictors (innovation characteristics and individual differences). The context studied was consumers’ prescription refill ordering process. Prescription refill requests can be filled through non-SST alternatives (speaking with a live customer service representative or mailing a refill request) or one of the SST alternatives (an interactive voice response [IVR] telephone system or an Internet-based system). Study 1 explored customer trial of the IVR telephone-based SST and in Study 2, they replicated Study 1 using internet ordering system for prescription refills as the SST of interest. A self-administered cross-sectional survey was carried out using existing scales for all measures except previous experience and perceived risk dimensions. The
sample size for first study was 828(users and non-users) and the second study had a sample size of 734 usable responses. They found that even customers who have a positive evaluation of an innovative service may choose not to use it if they do not understand their role (role clarity), if they perceive no clear benefit to using it (motivation), or if they believe that they are not able to use it (ability). The direct effects of the consumer readiness variables (role clarity, motivation, and ability) on trial were significant across both studies. Consumer readiness variables were stronger predictors of trial than were either the set of innovation characteristics or individual differences. The study however, looked only into trial as the dependent variable (DV) while other steps in the adoption process as proposed by Rogers (1995) should be explored in detail. Further, one or more of the consumer readiness variables mediated the direct effect of antecedent predictors on trial, the only exception being relative advantage. Compatibility and perceived risk were the dominant innovation characteristics to influence consumer readiness, while need for interaction, previous experience, technology anxiety and age were dominant for the individual differences variables. The study is conceptually sound and has been rigorously tested; however the findings are limited to one organization.

Lanseng and Andreassen (2007) examined consumers’ readiness and attitudes toward accepting and adopting SST in health diagnosis, explained using an extended TAM model. As a preliminary step, the respondent’s technology readiness was studied. Both print and online surveys were used for collecting data, yielding 160 usable responses from people in the age group of 18-65 years, who were randomly picked from different localities. The group consisted of Pioneers (middle class, belief in technology and optimistic), and accordingly further study was based on the assumption that on an average, Norwegian citizens will be receptive to TBSS. The second part of the study tried to understand the attitude of public toward e-health. The context discussed was internet based medical self-diagnosis and a scenario and questionnaire approach was adopted, in which respondents prior to responding read a scenario. Usable sample for this study was n= 470 and the both print and online version were used to elicit response. SEM was used to test the hypotheses. They tested 5 nested models and found that trust does not improve the model and that the original TAM specification is adequate in our credence-based e-health setting. Trust on the service e provider (here municipality) was found to have an influence on PU
and EOU. Indirectly, trust impacts attitude and later behavioural intention. Attitude was found to positively influence BI. The relationships between expected usefulness-Attitude, EU- EOU, EOU- Attitude are supported while EU- BI was not supported in the study. It was pointed out that with higher level of expected convenience (perceived usefulness in original TAM model) and ease of use (EOU) of the self-diagnosis service application, there was a greater chance to actually adopt the proposed e-health solution among people with a more positive attitude toward SST. However, the study has not looked at the trust towards the SST interface (internet) and other explanatory variables, which may give a better explanation to the study. Further exploring the study with public with lesser TR may provide a different result.

A review of 101 mixed method studies by Gagnon et al (2010) affecting implementation of information and communication technologies (ICTs) in clinical settings identified system usefulness and ease of use as factors aiding adoption. The most often cited barriers were related to design and technical concerns. Electronic Medical Records, Personal Digital Assistants, e-prescribing, e-learning, internet portal for patient education, internet-based network services and smart phones were some of the technologies discussed in the study.

2.5.6 SUMMARY

Thus to sum up, researchers have investigated a variety of antecedent factors influencing technology adoption, ranging from intrinsic user characteristics (Dabholkar and Bagozzi 2002; Lee and Allayway 2002; Bobbitt and Dabholkar 2001; and Parasuraman 2000), organizational characteristics (Curran and Meuter 2005 and Taylor and Todd 1995), technology-product related characteristics (Davis et al 1989 and Rogers 1995) to environmental influence factors (Dabholkar and Bagozzi, 2002 and Dabholkar 1996). Leung and Wei (1999) has grouped the factors affecting adoption or rejection of an innovation identified by Rogers (1986) as adopter-related personality traits, socio-economic influences, interpersonal channels and mass media use and perceived attributes of an innovation. Nevertheless there is a general consensus that factors facilitating or inhibiting adoption/non adoption of technologies by consumers, needs to be investigated further (Curran and Meuter 2005; Schumann 2003 and Walker et al 2002).
Kelly et al (2010), also highlighted that there is a dearth of a widely agreed SST model of adoption, as a review of literature on SSTs from 2000-2010 year yielded 29 different adoption factors. The researchers pointed out that there is a need for studies from the customer’s point of view with regard to awareness, adoption, repeated usage, and commitment to SSTs. Further, some of the contexts like healthcare are under researched when compared to financial or retail context.

2.6. TECHNOLOGY ADOPTION MODELS – A DISCUSSION

User acceptance of technology has been a significant field of study for over two decades, as organizations wanted to address the failures they faced with its adoption. With advancement in communication and information technologies, the extent and scope of customers performing services themselves have significantly increased. Self-service technology (SSTs) has been extensively employed, either as a means to enhance an organization’s efficiency or for catering to the changing needs of customer segments.

However Bobbitt and Dabholkar (2001) pointed out that a unifying theory to comprehend technology based self-service is lacking and tried to address this issue by proposing a conceptual framework. The researchers examined attitudinal theories to provide a better understanding of consumer motivation and behaviour related to technology-based self-service, in the context of internet shopping behaviour (using internet for purchasing and for information). The framework is based on Theory of Reasoned Action (TRA) and extended by incorporating category based affect (attitude towards using technology and towards SSTs), PBC from Theory of Planned Behaviour (situational influences), Theory of Trying (unfavourable/favourable effect), external influences (perceived risk and factors associated with product category). The model incorporated direct variables that were likely to affect attitudes as well as moderating variables that can influence the attitude-intention link. Factors associated with the product category (products of high risk categories, varied levels of consumer experience with a product category, products in search, experience and credence categories as well as products with varying levels of information) were expected to moderate the effect of attitude towards using technology based self-service (TBSS). The dimensions identified for studying direct influences on attitudes toward using
TBSS were attitude towards using technology and SST; and perceived risk. Further, they discounted subjective norms due to its weak effect on intention. It was proposed that although positive attitudes in general towards technology can have an influence on technology adoption, it is crucial to identify any unfavourable attitudes towards using a specific TBSS. However, the researchers presented only a conceptual framework, which was not tested empirically.

User acceptance of technology has been a significant field of study for over two decades, as organizations wanted to address the failures they faced with system adoption. The following table provides details of some of the major theoretical models that have tried to address this concern.

Table 2.1 provides details of some of the major theoretical models that have been used to understand technology adoption.
### Table 1.1 Major Theoretical Models used in Technology Adoption Studies

<table>
<thead>
<tr>
<th>THEORETICAL MODELS¹/ AUTHORS²/ CONSTRUCTS³</th>
<th>FINDINGS</th>
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<tbody>
<tr>
<td>1. Theory of Reasoned Action (TRA)</td>
<td>Proposed a conceptual model explaining volitional behaviour of an individual. A person's intention is a function of two basic determinants; one is personal in nature (attitudes) and the other reflecting social influence (social/subjective norms).</td>
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<tr>
<td>3. Attitude, Subjective norm, behavioural intention</td>
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<tr>
<td>1. Theory of Planned Behaviour (TPB)</td>
<td>Proposed an extension of TRA to explain non-volitional behaviour by including PBC. The model accounted for more variance in intention (44.5 per cent) than TRA model (37.27 per cent).</td>
</tr>
<tr>
<td>3. Attitude, Subjective norm, behavioural intention, perceived behavioural control (PBC)</td>
<td></td>
</tr>
<tr>
<td>1. Technology Acceptance Model (TAM)</td>
<td>Extended the TRA model with PEOU and PU and excluded SN. PEOU directly determine PU. Reliability and validity of the model tested by Davies with 120 users from IBM, Canada's Toronto Development Laboratory. Evaluation of 2 IBM PC based graphics systems - e-mail and file editor were carried out. Venkatesh and Davis (1996) discarded attitude construct as PEOU and PU directly determine one's intention to use technology.</td>
</tr>
<tr>
<td>2. Davis (1989)</td>
<td></td>
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<tr>
<td>3. Perceived ease of use (PEOU), Perceived usefulness (PU), BI.</td>
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<tr>
<td>Thompson et al (1991)</td>
<td>Directly predict usage behaviour instead of BI. One of the few models to include environment as a predictor variable to user acceptance of new technologies (Venkatesh et al 2003)</td>
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<tr>
<td>Attitude, SN, PBC, affect, social factors, and facilitating conditions.</td>
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<tr>
<td>Theory of Trying</td>
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<tr>
<td>Bagozzi et al (1992)</td>
<td>Empirical study carried out with student sample (n=96) by conducting a two wave survey (on introduction of a word processing program software and a follow up 14 weeks later). People form multidimensional attitudes towards learning to use a novel technology.</td>
</tr>
<tr>
<td>Attitude components – towards success, towards failure and toward the process of goal pursuit.</td>
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<tr>
<td>Diffusion of innovation Theory (DOI)</td>
<td>Factors involved in the diffusion process categorised into three groups: innovation decision process, attributes of innovations and attributes of innovators. Rogers also mentioned factors affecting rate of diffusion – type of innovation, type of communication, nature of social system and extent of change agents’ supportive efforts.</td>
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<tr>
<td>Five stages of innovation/adoption process– knowledge of innovation, forming attitude/persuasion toward the innovation, decision to adopt/reject, implementation of the new idea and confirmation of the decision. Innovation attributes- relative advantage, compatibility, complexity, trialability and observability Innovator attributes – innovators, early adopters, early majority, late majority and laggards.</td>
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</tr>
<tr>
<td>1. Decomposed Theory of Planned Behaviour (DTPB)</td>
<td>Integrated constructs from innovation characteristics (attitudinal belief dimensions) and decomposed SN and PBC into specific belief dimensions. Empirically tested using student data (n=786) based on their usage of a computing resource centre. It provided better diagnostic value and more understanding of the usage than the original TPB model.</td>
</tr>
<tr>
<td>3. PU,PEOU and compatibility (attitude), peer and superiors’ influence (SN), self-efficacy, resource and technology facilitating conditions (PBC)</td>
<td></td>
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</table>

| 1. Extended TAM model / TAM2 model | Original TAM model was extended with additional constructs introduced to explain BI through perceived usefulness. Studied in 4 different work contexts (manufacturing, finance, accounting, and international investment firm). Explains up to 60 per cent of the variance in perceived usefulness, which is an important driver of usage intentions. SN was found to have a direct effect on intention to use, over and above both perceived usefulness and ease of use. Cognitive instrumental processes had a significant impact on technology acceptance. Designed for a context where a new information system is introduced at a workplace. |
| 2. Venkatesh and Davis (2000) |  |
| 3. Core TAM model (PEOU, PU, BI) plus Social Influence constructs - SN, voluntariness and image) and cognitive instrumental processes (job relevance, output quality and result demonstrability) |  |

| 1. Model of Adoption of Technology in Households (MATH) | Consistent with TPB (Ajzen 1991) and decomposed TPB (Taylor and Todd 1995), attitudinal, normative, and control beliefs will influence household PC adoption. A nation-wide, two-wave, |
| 2. Venkatesh and Brown (2001) |  |
| 3. attitudinal belief (utilitarian outcomes, hedonic outcomes and social |  |
outcomes), normative belief (social influence and various secondary sources of information–mass media) and control belief (lack of knowledge, difficulty of use and high cost)

<table>
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<tr>
<th>Longitudinal investigation via telephonic interview was carried out among American public (n= 733). Adoption decision was driven by utilitarian outcomes, hedonic outcomes (fun) and social outcomes (status). Non-adoption was influenced by rapid changes in technology and the consequent fear of obsolescence.</th>
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</table>
| 1. TAM3 model  
2. Venkatesh and Bala (2008)  
3. TAM 2 Model + Anchor (self efficacy, perceptions of external control, computer anxiety and computer playfulness) and Adjustment (perceived enjoyment and objective usability) |
| Extended TAM 2 with Venkatesh’s (2000) earlier model of the determinants of perceived ease of use. The determinants of perceived ease of use were divided into anchoring and adjustment constructs. |
| 1. Unified Theory of Acceptance and Use of Technology (UTAUT)  
3. Performance expectancy (PE), effort expectancy (EE) and social influence (SI).  
Moderators:- gender, age, experience and voluntariness of use |
| Formulated a model integrating 8 existing models:-TRA, TAM, TPB, Motivational model, Model of PC utilization, Innovation diffusion theory and Social cognitive theory, and model combine of TAM and TPB. BI can be determined by PE, EE and SI. Longitudinal field studies carried out at four organizations. UTAUT accounts for an average of 70 per cent of user’s behavioural intention when deciding to use or adopt innovative technology when compared to existing theories prediction ability (17-50 per cent) (Rosen 2004 and Venkatesh et al 2003). |
2.7. HEALTH BEHAVIOUR MODELS- A BRIEF OVERVIEW

The following section gives a brief overview of the health behaviour models. There has been a surge in studies dealing with health behaviours from mid 1980s, as it is acknowledged that by adopting health enhancing behaviours, an individual can bring positive changes to one’s health and wellbeing (Conner and Norman 2005). Health behaviours may have a positive impact on quality of life (QOL) as it will help in delaying the onset of chronic disease and extending active life span (Conner and Norman 1995). Social cognition models stress on the influence of cognitive factors, as it has been found to be the most important intrinsic factor in explaining behaviour. Further it has been accepted by researchers that effective interventions should be based on manipulations of cognitive factors to determine health behaviours.

Social cognition models (SCMs) can be broadly classified into two as attribution models, which discusses an individual’s causal explanations of health related events, with majority of the research focusing on how people respond to a range of illness. Self-regulation model (Leventhal et al 1980 and 1984) and works on illness representation based on Leventhal’s model belongs to this category.

The other type “examines various aspects of an individual’s cognitions to predict future health related behaviour and outcomes” (Conner and Norman 2005). Health Belief Model (HBM; Becker 1974), Protection Motivation Theory (PMT; Maddux and Rogers 1983), Theory of Reasoned Action (TRA; Ajzen and Fishbein 1980), Theory of Planned Behaviour (TPB; Ajzen 1991), Social cognitive theory (SCT; Bandura 1982) and Health locus of control (Wallston 1992) are the models falling into this class. Table 2.2 gives a brief description about health care models pertaining to self-care.
<table>
<thead>
<tr>
<th>Health Belief Models</th>
<th>Constructs</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Belief Model (HBM)</td>
<td>5 basic dimensions as a basis for behaviour: perceived severity of the condition,</td>
<td>Meta Analysis by Janz and Becker (1984) found perceived barriers, and perceptions of susceptibility to influence preventive self-care behaviours.</td>
</tr>
<tr>
<td></td>
<td>perceived susceptibility or vulnerability to the disease process, perceived benefits (belief in efficacy), costs/ barriers, and cues to action</td>
<td>Harrison et al (1992) meta-analysis however concluded that, the amount of variance in measured behaviour by the main HBM dimensions was small (&lt; 10 per cent).</td>
</tr>
<tr>
<td>Protection Motivation Theory</td>
<td>Perceived vulnerability, perceived severity, response efficacy, self- efficacy and protection motivation</td>
<td>High levels of fear would lead to avoidance/denial and low to moderate fear levels would motivate patients to comply has not been well supported empirically (Beck and Frankel 1981)</td>
</tr>
<tr>
<td>Theory of Reasoned Action (TRA)</td>
<td>Attitude and Social norm leading to behavioural intention</td>
<td>Lack of control measures heavily influence the explanatory power of TRA (Connor and Norman 1996 and Miller et al 1992).</td>
</tr>
<tr>
<td>Theory of Planned Behaviour</td>
<td>Attitude, Social Norm and Perceived behavioural control</td>
<td>The extended TPB model provides a useful framework for understanding self-monitoring behaviour (Shankar et al 2007)</td>
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<tr>
<td>Self-Regulation Theory</td>
<td>Dynamic interaction between the three stages (representation, coping and appraisal) and parallel processing: cognitive and emotional processes may operate independently, although they generally interact</td>
<td>Perceptions of treatment effectiveness are better predictors of regimen adherence than perceived barriers (Glasgow et al 1997). ‘Offer the best system for identifying the determinants of patient self-care behaviour’ (Harvey and Lawson 2009).</td>
</tr>
</tbody>
</table>
2.7.1 SUMMARY

Out of all the models discussed, Technology Acceptance Model (TAM) is one of the most influential and discussed theories in predicting end-user acceptance and usage of technology. (Davis et al 1989; Adams et al 1992; Venkatesh and Davis 2000; and Venkatesh and Morris 2000).

However Mathieson (1991), while investigating the prediction of people’s intention to use technology, compared TAM (Davis, 1986, 1989) with TPB (Ajzen, 1988, 1991). Three main differences were identified:

- TAM supposes that usefulness and ease of use are the main influences on use decisions, while TPB primarily explores beliefs that are specific to each situation and that some beliefs may generalize to other contexts and others may not.
- Unlike TPB, the TAM is not as detailed as the TPB in determining social variables.
- TPB has a stronger treatment of behavioural control, whereas TAM only examines ease of use in regards to technology.

Mathieson (1991) suggested that, while TAM is useful for gathering general information about people’s perception of a system, TPB can provide detailed information regarding each of its components that might relate to a specific group of people. Mathieson (1991) suggested that, while TAM is useful for gathering general information about people’s perception of a system, TPB can provide detailed information regarding each of its components that might relate to a specific group of people.

Benbaset and Barki (2007) criticized TAM model stating that although powerful in terms of prediction, ‘repeatedly demonstrating that certain mediators (beliefs) are influential without understanding how to influence such beliefs through IT design is ultimately of limited value’. They also stated that TAM has demonstrated to be to a great extent weaker in terms of generating actionable knowledge.

Bagozzi (2007) has questioned the fundamentals of the TAM by criticizing it to be too simple and leaving out important variables. According to him, system usage should
not be seen as a terminal goal but as a means to a more fundamental goal. Further he also expressed his doubts about intention to use leading to actual system use. Many other factors than intention may determine individual’s technology usage and the link between the two is full of uncertainties.

There is a dearth of research in services literature that delves into the studies “of services customers need but may not want, such as health care” (Berry and Bendapudi 2007). It has been pointed out by Kotler (1973) that healthcare services are fundamentally poles apart from other services, and it is characterized by a negative demand from the consumer’s side. It is one service which ‘customers’ avail with a lot of unwillingness and anxiety (Berry et al 2004). Taking into account these arguments, it is therefore essential to develop a model that explains technology adoption in a healthcare context.

Goden and Kok (1996) stated that Theory of Planned Behaviour (TPB) is effective in predicting intention to engage in health-related behaviours, based on fifty six studies focusing on healthcare. Hung and Chang (2005) found that TPB was better than TAM in explaining behaviour and has been applied to forecast consumer behaviour, technology adoption behaviour (Mathieson 1991 and Taylor and Todd 1995), health related behaviours, student learning behaviour etc. Since TPB has been successfully used in both technology and healthcare domain, TPB model is used as the reference paradigm in the present study.

2.8. THEORY OF PLANNED BEHAVIOUR (TPB) – A DISCUSSION

TPB (Fig.2.1) postulates “that only specific attitudes toward the behaviour in question can be expected to predict that behaviour” (Ajzen 1991). The TPB is an expectancy value model with emphasis on attitudes, subjective norms, PBC, intentions, and behaviour directed to a specific focus. ‘Outcome expectancy is the belief that a given behaviour will lead or will not lead to a given outcome, whereas outcome value is the person's evaluation or subjective value placed on that outcome (Ajzen and Fishbein 1980). ‘The model quantifies outcomes as the multiplicative combination of the perceived likelihood that performance of the behaviour will lead to a particular outcome and evaluation of that outcome. These expectancy-value products are then summed over the various salient consequences’ (Peak 1955; as cited in Conner and
Armitage 1998). An individual is more motivated to perform a behaviour that will result in an outcome that is highly valued. When one does not believe that an act will lead to a specific outcome or the outcome is not valued, the individual will be less motivated to perform behaviour. TPB postulates that the global motives of behaviour, namely; AB, SN and PBC are respectively determined by attitudinal beliefs and outcome evaluation, normative beliefs and motivation to comply, and control beliefs and perceived power of the control factor under consideration (Ajzen 1991).

The TPB proposes a causal chain that connects behavioural beliefs, normative beliefs, and control beliefs to behavioural intention and actual behaviour via attitude, subjective norms, and perceived behavioural control (Montano and Kasprzyk 2002). Ajzen (2006) has stated that an understanding of specific beliefs will explain why people hold certain AB, SN, and PBC which will aid in designing interventions to enhance behavioural intentions. Salient behavioural beliefs (beliefs about the consequences of performing the behaviour) are held to determine AB. Salient normative beliefs (beliefs about the views of significant others) are held to determine SN. Salient control beliefs (beliefs about factors that may facilitate or impede performance of the behaviour) are assumed to determine PBC. Darker et al (2007) pointed out that salient beliefs are the most crucial psychological determinants of behaviour that operate through TPB constructs. Therefore the researcher must recognize five to nine salient beliefs that are context and population specific (Ajzen and Fishbein 1980). However, Hardeman et al (2002) indicated that a majority of the TPB-based studies identified only cognitive targets for change, overlooking the need to use the specific beliefs to change those cognitions. TPB asserts that beliefs are specific to each situation and cannot be generalized (Pavlou and Fygenson 2006).

![Figure 1.1 Schematic Representation of the TPB Model](image)

**Figure 1.1 Schematic Representation of the TPB Model**

**Source:** Ajzen website
Ajzen (1991) has stated that the comparative significance of AB, SN and PBC will vary across behaviours and situations and the magnitude of PBC-BI relationship is dependent upon the type of behaviour and the nature of the situation. The above mentioned three variables make independent contributions toward predicting BI.

2.8.1. ATTITUDE TOWARDS BEHAVIOUR (AB) – A DISCUSSION

AB can be defined as an individual’s overall evaluation of the specific behaviour. AB is defined as a person's favourable/unfavourable evaluation of the behaviour in question. Attitude is determined by beliefs about the consequences of engaging in certain behaviour (behavioural beliefs) and the corresponding favourable or unfavourable judgments about the possible consequences of the behaviour (outcome evaluation). It has been noted that attitude may contain instrumental (desirable–undesirable and valuable–worthless) as well as experiential or affective (pleasant–unpleasant and interesting–boring) aspects (Ajzen and Driver 1991; and Crites et al 1994). However, research with the TPB has been criticized for focusing on the instrumental aspects of attitudes to the detriment of affective aspects (Bagozzi et al 2001).

Ajzen and Driver (1991) reported affective measures of attitudes to be more closely related to intentions than were instrumental measures in four out of five behaviours studied (Ajzen and Timko 1986; and Manstead and Parker 1995). While these components tend to be highly correlated, they can be distinguished empirically and apparently have diverse functions (Breckler and Wiggins 1989 and Greenwald 1989). Further, studies have also revealed that this distinction can be made on the basis of the belief systems that underlie the constructs (Trafimow and Sheeran 1998). The instrumental component refers to possible advantages and disadvantages while an affective component include more emotional aspects of attitude –the extent to which a behaviour is seen as enjoyable and likeable (French et al 2005). Ajzen and Fishbein (2005) have indicated that appropriate attitude measures for use in the TPB should contain items representing the instrumental and affective or experiential components of attitudes. Although usually combined, recent research (Blanchard et al 2003 and
Rhodes and Courneya 2003) suggests that these two evaluative dimensions should in fact be treated as separate variables.

2.8.2 SUBJECTIVE NORMS (SN) – A DISCUSSION

SN is defined as the perceived social pressure to perform or not perform the behaviour in question. The operational definition of SN indicates the extent to which individuals perceive that significant others pressure them to adopt health behaviour (Ajzen 1991). However there has been markedly less support for the role of normative factors in attitude–behaviour relations. In a review of 19 TPB studies Ajzen (1991) established that almost all had significant relationships between attitude and intention, but less than half reported significant relationships between SN-BI. Similar results were reported by Conner and Armitage 1998; Hagger et al 2002 as well as a meta- analytic review of TPB studies by Armitage and Conner (2001). The meta-analytic review found SN to be weaker than attitude and PBC in predicting behavioural intention, leading to the suggestions to improve the normative measure by improving its measurement and expanding the normative component.

Similarly in the field of IS acceptance literature conflicting views on significance of SN is presented. Studies by Davis et al (1989) and Matheison (1991) were unable to establish a significant relationship between SN-BI as a determinant of IT usage. The finding was justified by stating that there were no real consequences associated with the behaviour under study, nor any external pressure on the target behaviour (Davis et al 1992). Hartwick and Barki (1994) were of the opinion that SN-BI relationship will be significant if the study pertained to an actual behaviour with real consequences with its relative importance decided by the phase of implementation of the technology (early stages of implementation, higher will be the importance of SN). Tan and Teo (2000) found that the influence of SN on an individual’s intention to adopt Internet banking was not significant. Conversely, Bhattacharjee (2000) showed that SN (interpersonal and external influences) was an important predictor of intention to use electronic brokerage services. External influence refers to ‘mass media reports, expert opinions, and other non personal information considered by individuals in performing a behaviour’; while interpersonal influence refers to ‘influence by friends, family members, colleagues, superiors, and experienced individuals known to the
potential adopter’. Similar to the usage of interpersonal influence for measuring SN by Bhattacherjee (2000), Taylor and Todd (1995) and Venkatesh and Davis (2000) has substantiated the relationship between pre-adoption SN and adoption intention. Conner and Armitage (1998) argue that the failure to consider all of the relevant social factors is one of the reasons that contribute the mixed result. It was also partly attributed to the use of single item measures with lower reliability (Povey et al 2000). Another set of researchers have stated that the lack of predictive validity for subjective norms in TPB is due to its operational definition which covers interpersonal influences from significant figures (parental influence) and not group influences (Armitage and Conner 2001; Hagger et al 2002 and Hagger and Chatzisarantis 2006).

Taking cue from the two component TPB model, SN beliefs are posited to comprise both injunctive (perceived pressure from important others to perform a behaviour) and descriptive (perceived observation of important others performing a behaviour) beliefs (Ajzen 2006). A meta-analysis found that descriptive norms added 5 per cent to the explained variance in intention after controlling for TPB variables (Rivis and Sheeran 2003). However researchers like Hagger et al (2002); Jonsson and Conner (2000) and Sheeran and Orbell(1999) argued that conceptually speaking, injunctive and descriptive norms both refer to pressuring or controlling types of social influence and are empirically significantly and highly correlated.

It is imperative to examine the role of SN from a practical and theoretical perspective. An understanding of social norms may help in chalking out probable opportunities for intervention as well as for eliciting behaviour change. Further, it may also help in explaining the role of SN in AB - BI relations.

2.8.3 PERCEIVED BEHAVIOURAL CONTROL (PBC) – A DISCUSSION

PBC relates to the extent to which one believes that one has control over personal or external factors that may aid or restrain the behavioural performance. PBC reflects beliefs regarding access to the resources and opportunities needed to perform behaviour or alternatively to the internal and external factors that may impede performance of the behaviour. Within the TPB, PBC is held to affect both intentions
and behaviour. Notani (1998) pointed out that the nature, formulation, and adequacy of PBC employed in a study is very significant in providing support for the TPB model, as this dimension differentiates TPB from TRA. Ajzen (2002) suggested that PBC “should be read as perceived control over the performance of behaviour.” He further stressed that PBC is different from attitude, in that it denotes a subjective degree of control over the performance of behaviour and not the perceived likelihood that performing the behaviour will produce a given outcome. Thus PBC along with attitude and SN is a co-determinant of intention and PBC with intention is a co-determinant of behaviour.

PBC was initially proposed as a construct synonymous with self-efficacy (Ajzen 1991) but in a later study, Ajzen (2002) proposed that the TPB can be modified by separating the construct of PBC into two separate constructs: self-efficacy (an individual's situation-specific self-confidence for engaging in the behaviour) and controllability (the extent that an individual has access to means to exert control over the target behaviour. Trafimow et al (2002) has pointed out that PBC has been used to refer different things resulting in confusion. PBC has been used to refer to the extent to which the behaviour is under voluntary control (Ajzen 1988), the ease or difficulty of performing the behaviour (Ajzen and Madden 1986) and to external constraints on the behaviour (Terry and O’Leary 1995).

Based on meta-analysis of TPB studies, Trafimow et al (2002) named perceived difficulty (extent to which individuals consider behaviour to be easy or difficult to perform) and perceived control (extent to which people consider the performance of a behaviour to be under their voluntary control), instead of self-efficacy and controllability, respectively as comprising PBC. This study was similar to the work of Sparks et al (1997). In a meta-analysis of twelve empirical tests across a range of behaviours including exercise, Trafimow et al (2002) found that perceived difficulty had greater predictive validity for both intention and behaviour.

In the study carried out by Rhodes and Courneya (2003) controllability was found to be superior to self-efficacy in predicting intention and behaviour. An empirical study carried out among internet consumers by Pavlou and Fygenson (2006) considered PBC as a second-order factor formed by the first-order dimensions of SE and controllability (formative model). Rhodes and Blanchard (2006) in their study on
exercise behaviour were of the opinion that PBC when considered as a multidimensional construct (self-efficacy and controllability) had estimation problems for both the multidimensional and the higher order model. They argued that aggregation of TPB components is not warranted, and the PBC components may possess a structure more complex than simple multidimensionality or a super ordinate higher order construct. However in Cammock et al (2009) empirical study with student samples; the researchers concluded that incorporating multidimensional PBC constructs (self-efficacy and controllability) proved a superior model over conventional TPB as it accounted for 60 per cent of the variance in BI. In their study of women’s health seeking information on web (Yoo and Robbins 2008) noted that the reliability and validity of PBC has not yet been established, as the way of conceptualizing and operationalizing PBC differs from study to study. They like earlier researchers (Notani 1998; Bagozzi and Kimmel 1995 and Sparks and Shepherd 1992) further called for more research to understand the PBC construct. Table 2.3 highlight both the traditional conceptualization of core TPB constructs as well as the ‘two-component’ TPB model. According to the latter, it is envisaged that each of the TPB constructs may be enhanced by splitting it into two components (McEachan et al 2010; Rhodes and Courneya 2003; Conner and Sparks 2005 and Ajzen 2006).

Table 2.3 Theoretical conceptualization of TPB Models by Ajzen

<table>
<thead>
<tr>
<th>Construct Definition</th>
<th>Core TPB model</th>
<th>‘Two-component’ TPB model</th>
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<tbody>
<tr>
<td>Attitude towards behaviour (AB) refers to the degree to which a person has a favourable or unfavourable evaluation of the behaviour in question</td>
<td>Only cognitive/instrumental aspect of attitude</td>
<td>Both instrumental and experiential or affective aspects of attitude are considered</td>
</tr>
<tr>
<td>Subjective Norm (SN) refers to perceived social pressure to perform or not to perform the behaviour</td>
<td>Only injunctive (perceived pressure from important others to perform a behaviour)</td>
<td>Comprise of both injunctive and descriptive (perceived observation of important others performing a behaviour) beliefs.</td>
</tr>
<tr>
<td>Perceived Behavioural Control</td>
<td>PBC was initially</td>
<td>Comprise of self-</td>
</tr>
</tbody>
</table>
(PBC)- People’s perception of the ease or difficulty of performing the behaviour of interest

proposed as a construct synonymous with self-efficacy (an individual’s situation-specific self-confidence for engaging in the behaviour)

efficacy and controllability (the extent that an individual has access to means to exert control over the target behaviour)

2.8.4. INTENTION – BEHAVIOUR LINK – A DISCUSSION

Intention captures the motivation to enact the behaviour (Ajzen 1991). The theory proposes that behaviour can be best predicted from intention, which is an indicator of how hard people are willing to try and how much effort people plan to exert towards performance of future behaviour. Some studies find intention to be a stronger predictor of behaviour than PBC (Blanchard et al 2003) while others have found that PBC and more specifically, self-efficacy is a stronger predictor of behaviour as well as intention (Armitage and Conner 2001 and Trafimow et al 2002). Meta-analysis by Sheeran (2002) and Webb and Sheeran (2006) provided substantial evidence that intentions are predictive of behaviours, agreeing with original TPB’s model. However both studies also noted that a variety of factors (behaviour types and measurement) could affect the strength of the relationship between intentions and behaviours.

2.9. EXTENSION OF THE TPB MODEL

Ajzen (1991) indicated that after the existing variables of the theory have been taken into account, the TPB is essentially open to extension by the integration of additional variables. Thus in this study, along with the TPB beliefs, the context specific beliefs – illness beliefs are elicited and the direct effect of personal norm and facilitating conditions are also discussed. Further, the mediating and moderating effects of illness acceptance and age and gender are also taken into account.
2.9.1 ILLNESS BELIEFS

Context is an important aspect of understanding the technology and its use, as technology is embedded in a context (Orlikowski and Iacono 2001). Moon and Kim (2001) also highlighted that the context, target users and technology are major contributing factors facilitating the acceptance of a new technology. Similarly, the criticality of contextual factors in individual assessments of technological products or services has also been pointed out by Shih and Venkatesh (2004), demonstrating the need for taking into account different contexts in the study of the consumer–SST relationship. Curran and Meuter (2005) and Walker and Johnson (2006) studied adoption factors across different SSTs and accounted that these varied by SST type, further strengthening the need for studying contexts in technology studies. Therefore, an understanding about the illness context is necessary for understanding self-care technology adoption, which has been discussed with the theoretical framework provided by self-regulation model.

The self-regulation model is “increasingly being used to understand and predict individuals’ coping with and subsequent self-care of chronic illness (Skinner et al 2002). According to the Self-Regulation Model (SRM), it is the patient’s individual set of cognitive representations and emotional representations that determine his or her health behaviour (Michie et al 2003 and Leventhal et al 2003). It has been suggested that illness representations may help in explaining the variation in disease related functioning in terms of self-care and medical outcomes.

Edgar and Skinner (2003) in their discussion of illness representation identified three differences from other social cognition models that take into account the role of patient beliefs and attitudes in determining health behaviours:

“(a) Illness representations are an extension of schema theory from cognitive social psychology. Thus, unlike other social cognition models, illness representations are grounded in a general theory of cognition that accounts for the merging of incoming information with past experience.

(b) Illness representations differ by being patient generated, rather than researcher generated. Illness representations are concerned with those variables that patients themselves believe to be central to their experience of illness and its management.
(c) Illness representation include the representation of emotional responses to
disease and treatment, which is lacking in the other health belief models.”

Eliciting and discussing patient’s beliefs and stimulating independent performance of
health-related behaviours are postulated as a requirement for self-care behaviour,
leading to promotion of better health outcomes. The five core dimensions of the
cognitive representation of illness beliefs are illness identity (beliefs about the illness
label and knowledge about its symptoms), cause (beliefs regarding the factors that are
responsible for causing the illness), consequences (beliefs regarding the perceived
physical, psychological, social and economic impact of illness), timeline (beliefs
about the course of the illness and time scale of illness symptoms), and cure/control
(beliefs about how one controls or recovers from the illness).

2.9.2 PERSONAL NORM

Although an early conceptualization of TRA did include personal norm (Fishbein
1967), later it was excluded as it showed high correlation with behavioural intention
(BI) and therefore, its propensity to confuse an understanding BI (Fishbein and Ajzen
1975). Therefore it was not included in the later conceptualizations of TPB and TRA.
Personal norm is defined as one’s “belief about what he personally feels he should
do” as compared to the social normative belief about what significant others think he
should do. However researchers like Godin and Kok (1996) brought forth the
significance of the role of personal normative influences in TRA/TPB studies
discussing health behaviours. The authors also acknowledged moral norm and self-
identity or role identity as components of personal normative influences. Moral norm
is the feeling of personal responsibility regarding performance or not of a given action
whereas self-identity or role identity was defined as “one’s perception of how a
person like me should behave.” Later studies used moral norm synonymous with
personal norm. Manstead (2000) defined moral norm as people’s convictions that
behaviour is “inherently right or wrong, regardless the personal or social
consequences.”
2.9.3. FACILITATING CONDITIONS (FC)

The availability of resources (time, money or other specialized resources) that is needed to engage in behaviour was termed as facilitating conditions by Triandis (1979). This was incorporated in Taylor and Todd (1995) study to understand usage of information technology. This construct has been used in MCPU model to predict PC utilization (Thompson et al 1991) and suggested its inclusion in intention models. FC is defined “as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” and has been included in UTAUT model (Venkatesh et al 2003). Igbaria et al (1989) pointed out that facilitating conditions (organization support) is crucial in discussing the needs and concerns of users. Facilitating conditions was also found to have a positive effect on usage behaviour of clinical decision support systems by physicians (Chang et al 2007).

2.9.4. MEDIATING EFFECT –DISCUSSION OF THE VARIABLES

Illness acceptance, long term orientation and quality of life considered as mediating variables in the study are discussed below.

Illness acceptance was initially described as the ‘acceptance of loss’ (Dembo et al 1956). According to Evers et al (2001), ‘it is the recognition of the need to adapt to a chronic illness while perceiving the ability to tolerate the unpredictable, uncontrollable nature of the disease and handle its aversive consequences’. It is expressed as halting the search for a definitive solution with physical complaints and as a reorientation of attention towards positive everyday activities and other aspects of life (McCracken and Eccleston 2003). Acceptance has also been related to increased physical and psychological well-being, higher quality of life and better prognosis in patients suffering from various illnesses (Evers et al 2001 and Richardson et al 2001). Therefore, this dimension is considered as a mediator in the present study.

Long-term orientation is the fifth dimension that is concerned with the time orientation of cultures (Hofstede 2001 and 2005). It defines ‘the extent to which a society exhibits a pragmatic, future-oriented perspective rather than a conventional historic or short-term perspective’. China has the highest long-term orientation score (118), India scores (61), United Kingdom (25) and the United States scores (29).
Yoon (2009) and Gupta et al (2010) suggested that Indians are more probable to take
risks or will not be concerned about taking protective actions in ambiguous situations,
as they believe in future rewards due to higher LTO culture. They also may put off
decision taking until they are secure about the outcome (Pavlou and Chai 2002).
Further, individuals from short term orientation cultures were found to adopt new
technology quickly (Pookulangara and Koesler 2011).

QOL is a ‘primary measure of outcomes since it relates to both the advantages and
disadvantages (risks and benefits) of health intervention in the management of
disease’ (Jambon and Johnson 1997). Further they stated that QOL is recognised as
both a regulatory requirement and a marketing tool, as it is perceived as a major factor
in “influencing the prescription or purchase of new drug products”. For the purpose of
this study, QOL is defined as the perception and feeling about one’s current health
experience.

2.9.5. MODERATING EFFECT OF DEMOGRAPHIC VARIABLES

“Moderators are variables that affect the strength or direction of relationships between
exogenous and endogenous variables; they divide “a focal independent variable into
subgroups that establish its domains of maximal effectiveness in regard to a given
forth the need for including moderator variables in studies as they argued that “it is
clear that the extensions (moderators) to the various models identified in previous
research mostly enhance the predictive validity of the various models beyond the
original specifications.”

The demographic variables were shown by Assael and Roscoe (1976) as the most
commonly employed means to segment markets and they were of the opinion that
demographic segmentation will add value to studies in the services sector. Considering socio demographic variables as moderator variables that
changes the strength of the attitude–intention and intention–behaviour
relationships is of more interest because understanding when the TPB variables are
most predictive of intentions and behaviour provides some insight into when
changes in those variables are likely to affect intentions and behaviour.

63
A comprehensive review by Rogers (1995) of the relationship between age and innovation adoption found that only half of the 228 studies reviewed showed a significant relationship between age and adoption behaviour. Bellman et al (1999) identified age, education and income as having an influence on online buying decisions. But some of the later studies by Sorce et al (2005) and Modahl (2000) showed that age as having only a very marginal influence on online buying decisions. Todman (2000) stated that female respondents expressed greater discomfort with SST and appeared to be short of control over technology and confidence in using technology and also looked forward to assistance (Burke 2002). In another study, Taiwanese men in the age group 36-40 years showed better attitude towards online shopping (Wu 2003). Lee et al (2010) in their study, found that women exhibited a lower level of technology innovativeness and increased technology anxiety, while respondents with higher income showed a lower level of technology anxiety. Respondents who were older looked forward to personal contact, displayed more technology anxiety and less technology innovativeness. However, education did not affect any of the studied personality traits as well as there was no difference in the extent of need for interaction between men and women.

2.10 SUMMARY

This chapter presented a detailed description about self-service technology (SST), its classification and SST adoption discussed in various contexts – banking, retail, healthcare and online and multiple service contexts. An evaluation of the theoretical models explaining technology adoption, health belief models and a review of the Theory of Planned Behaviour (TPB) constructs – attitude, subjective norm and perceived behavioural control are examined in detail. Further the discussion of variables used to extend the TPB model–illness beliefs based on Self-Regulation Model, personal norm and facilitating conditions are discussed. This is followed by a review of the variables used to study mediating effect – illness acceptance, long term orientation and QOL and moderating effect of demographic variables.