

# Dimensions Affecting Consumers' Continued Usage and Frequency of Usage of Internet Banking: Empirical Evidence from India

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**Abstract**— *The goal of this study was to investigate the factors affecting consumers' continued usage and frequency of usage of internet banking in the Indian context. A survey research methodology was used to gather quantitative data from a cross-sectional mall intercept survey in Delhi comprising a sample of 372 internet banking users. The survey comprised technology, channel, social, and value and usage dimensions represented as scale items. After testing the data for normality and goodness of fit assumptions, exploratory factor analysis was performed for factor identification. Scale items were checked further for their reliabilities. The final factors identified were employed in hierarchical multiple regression and hierarchical logistic regression analyses to test the proposed framework, while controlling for the demographic characteristics. Several major substantive findings emerged from the present study. Value dimensions significantly and positively influenced consumers' continued usage as well as frequency of usage of internet banking. Channel dimensions identified as perceived safety and perceived specialty factor labels demonstrated a significant impact on consumers' usage of internet banking on a continual basis. With regard to consumers' frequency of usage the measure of perceived safety was found to be significant and perceived specialty to be non-significant. Among the influence exerted by the technology dimensions, measures identified as attraction to usability and attraction to trial ability were found to exert significant and positive influence on consumers' continued usage and frequency of usage of internet banking. Social dimensions were found to be non-significantly associated with consumers' continued usage and frequency of usage of internet banking. This study provides important implications for effective banking channel management and formulation strategies apart from identifying the relative importance of the various factors asserted from the customers perspective.*

**Index Terms**— E-Banking; Dimensions, Indian Customers' Perception & Satisfaction; Security.

## I. INTRODUCTION

The advent of the internet, rapid technological evolutions, globalization, financial deregulations, liberalization and consolidation of the financial markets has encouraged many businesses to change their traditional modes of operations (Mia *et al.*, 2007). Businesses are also utilizing technological advancements in order to make their services more accessible to consumers (Reid 2008). One such business entity is the retail banking sector that has been using a wider array of information systems over years (Wresch and Fraser 2006). The retail banking industry realized that relying exclusively on the traditional modes of competition, such as on price factors, is difficult in order to increase

revenue and market share in the industry. It is evident that the two largest expenses incurred by banks are, the maintenance of branch networks and the associated issue of the human resources in the form of overhead costs (Durkin *et al.*, 2008). Banks started to realize non-price factors such as distribution as an alternative strategy for differentiation, gaining competitive advantage and cost cutting (Daniel 1999). As a result, the financial services industry has become much more competitive over the last few years (Thornton and White 2001). In an intensifying competitive environment, superior distribution strategies relating to how to communicate with and deliver products to the customer effectively provides a comprehensive advantage to the banking institutions (Kerem *et al.*,

2003). Moreover, customers are also demanding greater convenience and accessibility as reflected in longer branch opening hours and an increase in the choice of delivery mechanisms. Therefore, many banks globally have started to take initiatives to set in place more cost-effective alternative service delivery systems (Shih and Fang 2004). The resulting trend has been the proliferation of service delivery channels through which consumers can interact with the banks. Therefore modern banks provide their consumers with increased channel choice that reach out to consumers through many different routes. Alternative service delivery systems such as, automated teller machines (ATMs), telephone, internet and wireless channels are now available to the consumers to perform their banking transactions in addition to the traditional branch banking (Reid 2008, Akinci *et al.*, 2004). Banks may not be able to go back to older forms of customer interaction by reducing the number of channels, because consumers have become accustomed to and indeed are utilizing a broad range of options (Durkin *et al.*, 2008). For the purpose of the present research internet banking is identified as the act of conducting financial intermediation on the internet (VanHoose 2003). It has been widely accepted that internet banking is the cheapest mode to provide electronic banking services and products to customers (Giglio 2002). With the emergence of internet banking, banking activities are no longer bound to time and geographical perspectives (Karjaluoto *et al.*, 2002). Moreover, internet banking offers 24 hours accessibility to consumers (Ismail and anni 2009). Gurau (2002) emphasized that internet banking services are attractive to its target markets for both individual consumers and corporate clients. Lee and Lee (2001) noted that internet banking provides

easier access to bank accounts and lower service charges. Furthermore, internet banking is associated with high speed of service and lower transaction costs (Chang 2002). Despite these advantages internet banking has not yet become the way in which the majority of banking transactions are undertaken.

From the above mentioned discussion it is evident that the marketers, banks, financial institutions and consumers need to make an effort to understand factors that are critical to consumers' intention to adopt, adoption and usage of internet banking (Kolodinsky *et al.*,

2004). There exists numerous internet banking research studies that have investigated the factors responsible for consumers' intention to adopt or adoption of internet banking (Gerrard and Cunningham 2003, Lee *et al.*, 2003). A persistent argument is that prior studies on internet banking adoption by consumers and the factors responsible for their adoption of the internet banking have produced mixed and sometimes conflicting results. This has culminated in a difficulty in articulating the precise findings of internet banking research (Ndubisi and Sinti 2006). Ndubisi and Sinti (2006) conclude that research on internet banking, from consumers' perspective, remains inconclusive. It is only recently that researchers started to understand the importance of consumers' continued usage, as well as frequency of usage, of internet banking and its impact on the financial performance of the banking sector (Kasheir *et al.*, 2009, Yousafzai *et al.*, 2005). The goal of any business entity in the long term is to increase its productivity and maximization of the profits. In order to achieve this it is vital to concentrate on the consumers' continued usage and frequency of usage of a particular product or service rather than only their acceptance of the service (Kim and Malhotra 2005). With these considerations in mind and the existing gaps in the knowledge surrounding consumers' usage of internet banking, the present research is oriented towards investigating the determinants to consumers' continued usage and frequency of usage of internet banking. It is evident that the literature related to, and concentrating on, consumers' continued usage and frequency of usage of internet banking is very minimal. Therefore, for the purpose of the present study several theories which are relevant to adoption studies in marketing are integrated with studies on the consumer decision making process in order to identify the possible determinants that might have an impact on consumers' usage of internet banking on a continual and frequent basis.

## II. LITERATURE SYNTHESIS

Several businesses are utilizing technological advancements in order to make their services more accessible to consumers as well as to improve their business performance and increase their productivity (Reid 2008). However, the correlation between technological advancements and increase in business productivity is feasible, only if they are accepted by the intended users

(Venkatesh *et al.*, 2003). Thus from the existing research, possible theoretical models that provide a comprehensive understanding of the user acceptance has roots in information systems, psychology and sociology. The present study proposes the application of integrated technology and diffusion of innovations models in order to capture factors which might have a significant impact on the continued usage of internet banking by consumers' in India. Four theories are discussed in detail which might affect consumers' perceptions towards use of internet banking. The theories that are reviewed include:

(1) Theory of Reasoned Action (TRA) predicts the determinants of intended behavior of individuals (Fishbein and Ajzen 1975).

(2) Theory of Planned Behavior (TPB) is an extension of TRA by addition of perceived behavioral control (Ajzen 1985).

(3) Technology Acceptance Model (TAM) determines the adoption and usage patterns with regard to the general acceptance of the technology (Davis 1989).

(4) Diffusion of Innovations (DOI) proposes factors that facilitate the decision to adopt an innovation (Rogers 1995).

TRA has been applied to explain the behavior beyond the acceptance of technology and includes four general concepts behavioral attitudes, subjective norms, intention to use and actual use. Individuals in general, evaluate the consequences of a particular behavior and develop intentions to act that are consistent with their evaluations. More specifically, TRA states that individual's behavior is predicted from their attitudes and subjective norms. TRA model is the predecessor to TPB. This theory added perceived behavioral control (PBC) to the antecedents identified by the TRA (Ajzen 1991). Thus BI is formed by one's attitude, SN and PBC, which reflects perceptions of internal and external constraints on behavior. Perceived behavioral control is defined as one's perception of the difficulty of performing behavior. The decomposed TPB model proposed by Taylor and Todd (1995) is an alternative version of the TPB model with decomposed belief structures. In this model, attitudinal, normative and control beliefs are decomposed in to multidimensional belief constructs. Decomposed TPB model provided mixed responses and is considered more complex by some researchers as it introduced a large number of factors (Hsu and Chiu 2004) and often considered as more useful and supported by others (Ok and Shon 2006, Jaruwachirathanakent and Fink 2005).

The main purpose of TAM is to provide a basis for identifying the impact of external factors on internal beliefs, attitudes and intentions. Thus TAM posits that the actual usage of technology can be predicted by users' behavioral intention and attitude towards use which in turn are influenced by the perceived usefulness and perceived ease of using a particular technology. TAM2 is a theoretical extension of the technology acceptance model that explains

perceived usefulness and usage intentions in terms of social influence processes such as subjective norm, voluntaries and image and cognitive instrumental processes such as job relevance, output quality, result demonstrability and perceived ease of use. According to DOI theory, individuals develop certain perceptions towards an innovation and based on these perceptions, an individual makes a decision whether to accept or reject an innovation (Agarwal and Prasad 1997, Moore and Benbasat 1991). An innovation is more likely to be adopted based on the innovation characteristics such as relative advantage, compatibility, complexity, trial ability and observability which are critical for potential adopters' perceptions (Rogers 1995). Moore and Benbasat (1996) refined a set of constructs that represents characteristics of innovations that are presented innovation diffusion theory. These constructs are widely used to predict individuals' technology acceptance (Plouffe *et al.*, 2001, Karahanna *et al.*, 1999, Agarwal and Prasad 1998, Moore and Benbasat 1991). DOI model has been refined to develop an instrument that can be used across a variety of innovation domains related to technology (Moore and Benbasat 1991). The developed model is intended to tap a variety of perceptions related to innovations. Two new constructs image and voluntaries were added.

Consumer decision making process is important in examining consumer purchasing behavior towards products and services (Engel *et al.*, 1976). The decision making process consists of five stages such as problem recognition, information search, evaluation of alternatives, choice and outcome. Most of the existing literature focuses on the consumer decision making process and its applicability in purchase of products. It is only recently Zeithaml and Bitner (2003) applied the consumer decision making process to services and reported the presence of the following five stages such as need recognition, information search, evaluation of alternatives, purchases and consumption, and post-purchase evaluation. Also Zeithaml and Bitner (2003) suggested that the sequence of the five stages in the context of services may not be linear. Type of situation and context play a dominant role in influencing consumers' decision to evaluate services (Zeithaml and Bitner 2003). Recent research suggests that consumers' pass through three critical stages during their purchasing process such as pre-purchase, purchase and post-purchase (Frambach *et al.*, 2007). Consumers' at pre-purchase stage seek information on the relevant attributes of the product or service that they consider for purchasing (Payne *et al.*, 1993). This stage is also associated with a specific channels' ability to enable the consumers to identify and obtain access to the product or service information (Peterson and Merino 2003). Comparison of the available information facilitates consumers' evaluation of various alternatives. Researchers exhibited evidence for consumers' preference to internet channels for information retrieval on complex services (Shankar *et al.*, 2003). Many existing

studies did not take into account the post-purchase stage of the consumer in the internet banking usage context. RA, TPB and TAM all intention models seems neglect group, social and cultural aspects of decision making process (Bagozzi 2007). Consequently these models heavily rely on naïve and simplified notions of affect and emotions. Mostly these models depend on a purely deterministic framework and often self-regulation processes are not taken into consideration. Also the models mentioned above attempt to evaluate consumers' post purchase decision making process. In reality, these theories do rely on consumers' perceptions of innovation characteristics as a significant predictor of behavioral intention. to date many researchers consistently contend and perceive that these theories are incomplete and that integration of these theories provide a better understanding and explanation of consumer evaluation of post purchase decision making process rather than that provided by each theory alone (Kasheir *et al.*, 2009). Consumers' continued usage and frequency of usage of internet banking assessment could be more complex as consumers' often need to abandon or minimize their current behavior and usual concerns associated with the technological advancements (Falk *et al.*, 2005). Use depends upon individuals' capability and capacity to engage with these proliferated service delivery channels (Walker and Johnson 2006). In discourse with the above mentioned discussion, technology, channel, social and value dimensions are identified as critical in influencing consumers' decision to use internet banking on a continual and frequent basis, thus controlling for the demographic characteristics.

### III. TECHNOLOGY DIMENSION

Relative advantage is defined as "the degree to which an innovation is perceived by potential adopters as being better than the idea, product or service it supersedes" (Rogers 1995). Also it is the degree to which an innovation is perceived as being better than its precursor (Moore and Benbasat 1991, p.195). Relative advantage construct is often considered as highly domain specific and with regard to internet banking services; it is evident in terms of price, convenience and performance (Black *et al.*, 2002). Moreover, cost saving and ability to bank at any time were critical encouraging attributes for consumers to adopt internet banking (Howcroft *et al.*, 2002). Compatibility is defined as "the degree to which an innovation is perceived as being consistent with the existing values, past experiences and the needs of adopters" (Moore and Benbasat 1991, p.195). Tan and Teo (2000) shown that the compatibility of internet banking service delivery channel is associated with the modern day banking consumer who is likely to be knowledgeable and familiar with the internet. Black *et al.*, (2001) reported that past experiences and the values of consumers significantly influence their willingness to adopt internet banking in UK. Complexity is defined as "the degree to which an innovation is perceived as difficult to understand

and use” (Moore and Benbasat 1991, p.195). Hewer and Howcroft (1999) noted that electronic banking requires certain minimum level of technological experience and competence which reduces the perception of its complexity by consumers. Extant research indicates that an innovation with substantial complexity requires greater technical skills, implementation and operational efforts to increase its chances of adoption (Tan and Teo 2000). Complexity in conducting financial transactions over the internet was inversely related to a consumers’ experience with internet (Black *et al.*, 2001). Trialability is defined as “the degree to which an innovation may be experimented with a limited basis” (Moore and Benbasat 1991, p.195). Ability to conduct a trial confirms how easy it is to use internet banking (Black *et al.*, 2001, Hewer and Howcroft 1999). Result demonstrability is defined as “the tangibility of the results of using the innovation including their observability and communicability” (Moore and Benbasat 1991, p.203). Agarwal and Prasad (1997) found a significant correlation between usage intentions and result demonstrability.

#### IV. CHANNEL DIMENSION

A key element in the social cognitive theory is the concept of self-efficacy which refers to an individual’s belief in his or her capability to perform a specific task. Bandura (1986) defines self-efficacy as “people’s judgment of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses (p. 391)”. It has been observed that consumers’ perceptions towards their self- efficacy significantly predicted their intention to use a wide range of technologically advanced products and services (Taylor and Todd 1995). Increased levels of self-efficacy also improve initiative and persistence that often lead to performance (Eden 1992). Risk plays a vital role in the consumer decision making process, as consumers’ perception of potential risk would often result in their resistance to adopt a particular technological advancement (Black *et al.*, 2001). The involvement of risk with consumer decision-making process may occur at pre purchase, purchase or post purchase stages (Cunnigham *et al.*, 2005). Therefore, investigating the perceived risk component from consumers’ perspective helps to better understand their behavior and provides important implications for marketing strategy. Consumers’ perception of high risk actually hinders internet banking adoption (Kamel and Hassan 2003). Important categories of risk based on consumers’ perceptions in internet banking context are likely to be financial, security and privacy risk related to the potential loss due to deficiencies in the operating system, illegal external access leading to misappropriation of funds and potential loss of personal information (Awamleh and Fernandes 2006).

Trust has been identified as a potential driving force

for development of electronic commerce applications as it determines the consumers’ acceptance and willingness to engage in various transactions (Herrmann and Herrmann 2004). Proper maintenance of trust between buyers and sellers is important for the success of e-commerce (Gulati and Sytch 2008). Suh and Han (2003) reported that consumers’ perceptions towards trust reduces their uncertainties and increases their transactional activities. Research indicates the delineation of online trust from offline trust (Yousafzai *et al.*, 2005). The concept of trust plays a crucial role in online environment due to its impersonal nature and extensive use of technology (Grabner-Krauter and Faullant 2008, Gan *et al.*, 2006, Yousafzai *et al.*, 2003). Offline trust characterized by attributes such as eye contact, tone of voice, appearance and behavior of people do not seem to be valid in an electronic environment (Yousafzai *et al.*, 2005). Several researchers identified lack of trust as an important feature related to consumers’ reluctance to perform online transactions (Flavian *et al.*, 2006). Trust is of an important concern in many social interactions (Pavlou and Fygenson 2006). Online trust is defined as a belief or expectation about the website or the web vendor and/or the internet as a trusted party or object of trust or as a behavioral intention or willingness to depend or rely on the trusted party (McKnight *et al.*, 2002). It has been evident from the literature that e-commerce websites utilizing the personalization content have increased their annual revenues (Parkes 2001). Also, web content personalization empowers online vendors to deliver user value and attain profits (Greer and Murtaza 2003). Light and Maybury (2002) reported that internet personalization helps to control aimless surfing activity by providing individualized content, offerings and services. Advocates of online personalization often claim that personalization agents have transformed the internet into a personal communication medium. However, there remains skepticism on the prospects associated with the internet personalization as the abovementioned was claimed to be highly over-rated (Nielsen 1998). Consumers’ often develop preferences as a function of task and contextual characteristics depending on the ease with which relevant attributes can be evaluated (Hsee 1996), information availability (Bettman *et al.*, 1998), and availability of the alternatives (Forman *et al.*, 2006). Consumers’ preferences as well as perceptions towards personalization are important as previous choices are used to predict their future decisions.

#### V. SOCIAL DIMENSION

Social influence is extensively identified in the existing literature as normative pressure or subjective norm refers to a persons’ perception of the social pressures put on him/her to perform or not to perform the behavior in question (Ajzen and Fishbein 1980). The role of social influence in an individuals’ decision whether or not to use a technology is complex and subject to a wide range of contingent influences

(Venkatesh *et al.*, 2003). Internet banking as a service innovation creates uncertainty and individuals who are uncomfortable with uncertainty will tend to interact with their social network before making a decision (Lu *et al.*, 2005). Mathieson (1991) reported that social variables could be important in influencing consumers' perceptions if they capture variance that is not already explained by other variables. The role of social norms in information technology usage literature to date is somewhat unclear (Yousafzai *et al.*, 2003). In the internet banking research generally is referred as normative belief structures or social norms, where it is frequently decomposed into relevant reference groups (Lu *et al.*, 2005).

## VI. VALUE DIMENSION

It is essential to know what consumers actually value, before one can truly understand the choice of a particular service delivery channel, its continued usage and frequency of usage. It is also of equal interest in identifying the attributes that are most important in consumers' judgments of value. The choice a particular banking service delivery channel, its subsequent acceptance, continued as well as frequency of usage depends on consumers' expectations of the value offered. It is important to understand what consumers' value for and what are the important dimensions that play a critical role in their judgments of value offering. Perceived value represents a consumers' overall assessment of the utility based on perceptions of what is received and what is given (Zeithaml 1988). Also perceived value is identified in literature as a tradeoff between the perceived benefits and perceived costs derived by the consumers from using a particular channel. Monetary payments and non-monetary sacrifices such as time consumption, and stress experienced by consumers' together include perceived costs (Yang and Peterson 2004). Whereas, customer perceived value emerges from an evaluation of the relative rewards and sacrifices associated with the offering. The above mentioned discussion leads to the following conceptual framework incorporating technology, channel, social and value dimensions. Below given is the **Conceptual Model**.

## VII. RESEARCH METHODOLOGY

The key objective of the research design is to determine consumer's beliefs and attitudes towards the continued use of internet banking and frequency of using internet banking. The most universally adapted tool to collect consumer's beliefs and attitudes is the self reporting technique, in the form of a self-administered questionnaire (De Vaus 2002, Malhotra *et al.*, 1996). Based on the literature review and available scales, a cross-sectional survey questionnaire was developed and administered to potential respondents in the foyer of a busy shopping mall in northern part of India especially Delhi. Cross-sectional survey was found to be useful partly because of the advantages associated with this

method such as low costs involved in implementation as well as low demands it places on the respondents (Zikmund 2003). The questionnaire developed consisted of information pertaining to respondents' general banking habits and internet usage, demographic characteristics, scale items and open-ended questions. For the purpose of this study, all the dimensions were measured using the existing scale items consisting of sub-dimensions. Data were obtained from the respondents who are current internet banking users, which used a six-point Likert scale defined as (1) Strongly Agree (2) Agree (3) Neither Agree nor Disagree (4) Disagree (5) Strongly Disagree and (6) Unable to Rate.

Technology dimensions included in the present study were operationalised consistent with the existing internet banking studies in various contexts consisting of five sub-dimensions (Hernandez and Mazzon 2007, Chan and Lu 2004). Channel dimensions were operationalised in accordance with work by Hernandez and Mazzon (2007), Chan and Lu (2004), Tan and Teo (2000), Bhimani (1996) and Cockburn and Wilson (1996), Lee (1996) with four sub-dimensions. Social dimensions were operationalised consistent with work by Chan and Lu (2004), Venkatesh and Davis (2000), Tan and Teo (2000) and Taylor and Todd (1995) with two sub-dimensions. Value dimensions were operationalised in accordance with work by Thomas and Sullivan (2005), Keen *et al.*, (2004), Petrick (2002), Zeithaml *et al.*, (2002), Sweeney and Soutar (2001) and Cronin and Taylor (1992) consisting of two sub-dimensions. Usage determinants were operationalised consistent with work by Hernandez and Mazzon (2007), Chan and Lu (2004), Tan and Teo (2000) and Venkatesh and Davis (2000).

After checking the data for any possible missing responses, descriptive statistics were obtained from the quantitative data. In order to make the data suitable for further analysis, data transformations were performed. Based on the theoretical and empirical guidelines, the study used exploratory factor analysis for data reduction and summarization. Principal component analysis was performed since the objective was to determine the minimum number of factors that will account for the maximum variance in the data for subsequent use in multivariate analysis (Tabachnick and Fidell 2001). As the factors are likely to be correlated promax rotation was used for obtaining more interpretable solutions. Once the factors were identified, reliability analysis was performed in order to identify the extent to which a scale produces consistent results. Cronbach's alpha scores were used to assess the reliability of several items in a scale.

## VIII. RESULTS AND DISCUSSIONS

As part of the research, a reasonably large number of variables needed to be measured and analyzed in a specific and ordered manner, the hierarchical multiple regression analyses was chosen as the most appropriate strategy for

measuring consumers' continued usage of internet banking (Cooksey 2007). Overall, the hierarchical multiple regression analyses will determine if the successive addition of technology, channel, social and value dimensions will improve the prediction of continued usage of internet banking by Indian consumers, beyond that afforded by the demographic characteristics. The specific order of entry of the predictor sets will be as follows:

- Demographic characteristics
- Technology dimensions
- Channel dimensions
- Social dimensions
- Value dimensions

The logical development of this prespecified order of the predictor sets is based on the entry of more stable individual characteristics to a more general and dynamic contextual factors. Thus, demographic characteristics will be entered first into the model, whose effects are to be controlled for followed by contextual factors such as technology, channel, social and value dimensions based on the theoretical importance. The  $R^2$  values, F change and significance values obtained would give the best indication of the predictor's potential. TABLE 1 displays the different variable sets entered in their sequential order, the  $R^2$  change and its associated degrees of freedom, F change and sig. F change including p-values for the partial F test. The right-hand portion of the table lists the sig. individual independent variable sets contributing to the predictor variable at that step, relating to the variables analyzed, the semi-partial correlation, partial F, and sig. p-value. The table also displays the overall  $R^2$ , the adj.  $R^2$  after entry of all independent variable sets, and the overall model F and p-value.

The Durbin-Watson statistic was used to test for the presence of serial correlation among the residuals i.e., the assumption of independence of errors, which requires that the residuals or errors in prediction do not follow a pattern from case to case (Meyers *et al.*,2006). For the present research, the Durbin-Watson statistic of 2.105 falls within the acceptable range. The tolerance values for all the independent variables were larger than 0.10, indicating that multicollinearity was not a problem in progressing with the proposed regression analysis (Cleveland 1984). Model summary of the hierarchical multiple regression analysis displays five models listed. Model 1 refers to the first block of variables that were entered into the analysis as control variables (demographic characteristics), while model 2 includes all the variables that were entered in both the blocks (demographics and technology dimensions). Model 3 relates to the addition of channel dimensions, model 4 includes the addition of social dimensions and model 5 includes all the variables that were entered in all the above mentioned 4 models and value dimensions

In evaluating the model, the  $R^2$  values in the model summary box were checked. Results indicate that, after the

variables in Block 1 (demographic characteristics) have been entered, the overall model explains 0.014% of the variance. After Block 2 variables (technology dimensions) have also been included, the model as a whole explains 0.246% of the variance. With the addition of Block 3 variables (channel dimensions), the model explains 0.378% of the variance. There was no increase in the variance after the inclusion of Block 4 (social dimensions) variables. However, with the addition of Block 5 variables (value dimensions), the overall model contributed to 0.434% of the variance.  $R^2$  change explains how much of this overall variance is explained by the variables of interest individually. The  $R^2$  change reported by Model 1 was 0.014, which explains only 1.4% of the variance in the dependent variable and was not a statistically significant contribution as indicated by the sig. F change value (0.527). In Model 2  $R^2$  change was 0.232, which means variables included in Block 2 (technology dimensions) explains an additional 23.2% of the variance in continued usage of internet banking, even when the effects of the demographic characteristics were statistically controlled for. This was a statistically significant contribution as indicated by the sig. F change (0.000). The  $R^2$  change in Model 3 reported was 0.132, indicating that the inclusion of Block 3 variables (channel dimensions) explains an additional 13.2% of the variance in the dependent variable and was statistically significant (0.000). There was no change in the  $R^2$  value with the inclusion of Block 4 variables (social dimensions), indicating that social determinants did not add significantly to the prediction of the continued usage of the internet banking. However, there was a change in the  $R^2$  with the inclusion of Block 5 variables (value dimensions) to 0.056, which explains an additional 5.6% of the variance in the dependent variable and was statistically significant with sig. F change value (0.000).

Table 1: Hierarchical multiple regression model summary

Model	R2	Adj. R2	R2	F Change	Df	Sig. F Change
1	0.014	0.002	0.014	0.857	6	0.527
2	0.246	0.229	0.232	55.873	2	0.000*
3	0.378	0.361	0.132	38.319	2	0.000*
4	0.378	0.359	0	0.192	1	0.661
5	0.434	0.415	0.056	35.491	1	0.000*
Durbin-Watson Statistic			2.105			

To find out how well each of the variables contributes to the equation, examination of the coefficients is important which summarizes the results, with all the variables entered into the equation. Scanning the sig. column, technology dimensions including attraction to usability (part corr = 0.458, partial F = 10.043,  $p < 0.001$ ) and attraction to trial ability (part corr = 0.189, partial F = 2.383,  $p < 0.001$ ), channel dimensions including perceived Safety (part corr = 0.236, partial F = 5.693,  $p < 0.001$ ) and perceived specialty (part corr = 0.199, partial F = 4.793,  $p < 0.001$ ) and value

dimensions (part corr = 0.236, partial F = 5.957, p < 0.001) made statistically significant contribution. The above mentioned details were presented in TABLE 2. Neither demographic characteristics nor the social dimensions made a unique contribution. Beta values represent the unique contribution of each variable, when the overlapping effects of all other variables were statistically removed.

**Table 2: Effects of the individual variables on continued usage of internet banking**

Model	Variable set	Part Corr	Partial F	Beta	Sig and variables
1	Demographic characteristics				NS
	Technology dimensions				
2	Attraction to Usability	0.458	10.043	0.468	<0.001*
	Attraction to trialability	0.189	2.383	0.115	<0.001*
	Channel dimensions				
	Perceived Safety	0.236	5.693	0.287	<0.001*
3	Perceived Specialty	0.199	4.793	0.218	<0.001*
	Social dimensions				NS
4	Value	0.236	5.957	0.322	<0.001*

The addition of demographic characteristics in step 1 and social dimensions in step 4, did not add significantly to the prediction of the continued usage of internet banking. Higher numeric values of the independent variables are also associated with the higher numeric values of the dependent variable. Thus respondents who strongly agreed on the attraction to usability and attraction to trial ability nature of internet banking also strongly agreed on the continued usage of internet banking in future. Also, respondents who strongly agreed on the perceived safety and perceived specialty aspects as the internet banking service delivery channel sub-dimensions agreed strongly on the continued usage of

internet banking. Respondents also exhibited positive association between the value dimensions and continued usage of internet banking. TABLE 3 provides the hypotheses testing outcomes of the research with continued usage of internet banking as a dependent variable.

Hypothesis	Result
Hypothesis 1: Continued usage of internet banking will show no differences on the basis of the demographic characteristics. Hypothesis 1a: Continued usage of internet banking will show no differences on the basis of gender.	Supported
Hypothesis 1b: Continued usage of internet banking will show no differences on the basis of the age.	Supported
Hypothesis 1c: Continued usage of internet banking will show no differences on the basis of the level of education.	Supported
Hypothesis 1d: Continued usage of internet banking will show no differences on the basis of the level of income.	Supported
Hypothesis 1e: Continued usage of internet banking will show no differences on the basis of the ethnicity.	Supported
Hypothesis 1f: Continued usage of internet banking will show no differences on the basis of the occupation.	Supported
Hypothesis 2: Technology determinants relate to the continued usage of internet banking.	Supported
Hypothesis 2a: Attraction to usability systematically relates to the continued usage of internet banking.	Supported
Hypothesis 2b: Attraction to trial ability nature of internet banking relates to the continued usage of internet banking.	Supported
Hypothesis 3: Channel determinants influence the continued usage of internet banking.	Supported
Hypothesis 3a: Perceived safety aspects of the internet service delivery channel influence the continued usage of internet banking. Hypothesis 3b: Perceived specialty aspects of the internet service delivery channel influence the continued usage of internet banking.	Supported
Hypothesis 4: Social determinants systematically relate to the continued usage of internet banking.	Not Supported
Hypothesis 5: Value determinants influence the continued usage of internet banking.	Supported

**Table 3: Hypotheses testing outcomes**

The decision to perform internet banking frequently was hypothesized to be a function of technology, channel, social and value dimensions apart from demographic characteristics. The variables are proposed to be entered into the logistic regression hierarchically in the same sequence as that followed in hierarchical multiple regression mentioned

earlier to predict continued usage of internet banking. The proposed empirical model takes the form,

$Frequency\ of\ using\ internet\ banking = f(Gender, Age, Education, Income, Ethnicity, Occupation, Technology Dimensions, Channel Dimensions, Social Dimensions, Value Dimensions, \epsilon)$

The discrete dependent variable frequency of using internet banking measures whether an individual is a more frequent or less frequent user of the internet banking. The probabilities of the Wald statistic and their Exp (B) representing the change in the odds of the modeled event would predict the frequency of using the internet banking by Indian consumers. The independent variables were entered into the logistic regression hierarchically following the same sequence as that of the hierarchical multiple regression. Demographic characteristics were entered initially in model 1 followed by technology, channel, social and value dimensions in subsequent models. The probabilities of the Wald statistic of the significant variables and their Exp (B) are presented in TABLE 4. The probability of the Wald statistic for the variable education was  $p = 0.031$ . The value of Exp (B) was 1.869 which implies an increase in the odds of 0.87%. Survey respondents with higher education were more prone to use internet banking frequently. Among the demographic variables entered into the hierarchical logistic regression, the variable income also associated significantly ( $p = 0.048$ ) with the frequency of internet banking usage. The Exp (B) was 1.595 which implies survey respondents with higher levels of income were more prone to use internet banking frequently with an increase in the odds of 0.60%.

Technology dimensions entered into the model after demographics and the probability of the Wald statistic was significant for attraction to usability ( $p = 0.000$ ) and attraction to trialability ( $p = 0.001$ ). Every unit increase in attraction to usability and attraction to trialability is associated with increase in the frequency of internet banking usage as high numeric values were associated with respondents who strongly disagree. With regard to the channel dimensions, perceived safety was significant ( $p = 0.000$ ) implying respondents likeliness to increase frequency of internet banking usage. However, perceived specialty did not show any relationship with the frequency of internet banking usage. Social dimensions entered in model 4, did not show any statistical significance with the frequency of internet banking usage. The probability of the Wald statistic of the value dimensions entered in model 5 was statistically significant ( $p = 0.000$ ) relating to respondents likeliness to increase frequency of internet banking usage.

Table 4: Hierarchical Logistic Regression

Step	Variable sets	B	S.E.	Wald df	Sig.	Exp (B)	variables
1	Demographic						
	Education	2.029	0.573	11.103	1	0.001*	7.653
	Income	1.393	0.447	9.118	1	0.002*	4.056
2	Technology						
	Dimensions						
	Attraction to Usability	1.015	0.141	40.018	1	<0.001*	2.672
	Attraction to Trialability	0.697	0.101	41.786	1	<0.001*	2.027
3	Channel						
	Dimensions						
	Perceived Safety	0.651	0.083	28.437	1	<0.001*	1.678
	Perceived Specialty	0.509	0.739	1.738	1	0.152	0.623
4	Social						
	Dimensions						
	Social	0.501	0.853	1.934	1	0.324	0.783
5	Value						
	Value	0.412	0.072	9.832	1	0.001*	1.527

Step	Characteristic	B	S.E.	Wald df	Sig.	Exp (B)	variables
1	Demographic						
	Education	2.029	0.573	11.103	1	0.001*	7.653
	Income	1.393	0.447	9.118	1	0.002*	4.056
2	Technology						
	Dimensions						
	Attraction to Usability	1.015	0.141	40.018	1	<0.001*	2.672
	Attraction to Trialability	0.697	0.101	41.786	1	<0.001*	2.027
3	Channel						
	Dimensions						
	Perceived Safety	0.651	0.083	28.437	1	<0.001*	1.678
	Perceived Specialty	0.509	0.739	1.738	1	0.152	0.623
4	Social						
	Dimensions						
	Social	0.501	0.853	1.934	1	0.324	0.783
5	Value						
	Value	0.412	0.072	9.832	1	0.001*	1.527

TABLE 5 provides the hypotheses testing outcomes of the research with frequency of internet banking usage as a dependent variable. Level of education and level of income among the demographic characteristics exhibited a positive impact on the frequency of internet banking usage. Among the channel determinants, perceived specialty statistically did not relate to the frequency of internet banking usage. Similarly, social determinants did not contribute much in predicting the frequency of internet banking usage.

Table 5: Hypotheses testing outcomes

Hypothesis	Result



Hypothesis 1: Frequency of internet banking usage will show no differences on the basis of the demographic characteristics. Hypothesis 1a: Frequency of internet banking usage will show no differences on the basis of gender.	Supported
Hypothesis 1b: Frequency of internet banking usage will show no differences on the basis of the age.	Supported
Hypothesis 1c: Frequency of internet banking usage will show no differences on the basis of the level of education.	Not Supported
Hypothesis 1d: Frequency of internet banking usage will show no differences on the basis of the level of income.	Not Supported
Hypothesis 1e: Frequency of internet banking usage will show no differences on the basis of the ethnicity.	Supported
Hypothesis 1f: Frequency of internet banking usage will show no differences on the basis of the occupation.	Supported
Hypothesis 2: Technology determinants relate to the frequency of internet banking usage.	Supported
Hypothesis 2a: Attraction to usability systematically relates to the frequency of internet banking usage.	Supported
Hypothesis 2b: Attraction to trial ability nature of internet banking relates to the frequency of internet banking usage	Supported
Hypothesis 3: Channel determinants influence the frequency of internet banking usage.	Supported
Hypothesis 3a: Perceived safety aspects of the internet service delivery channel influence the frequency of internet banking usage. Hypothesis 3b: Perceived specialty aspects of the internet service delivery channel influence the frequency of internet banking usage.	Not Supported
Hypothesis 4: Social determinants systematically relate to the frequency of internet banking usage.	Not Supported
Hypothesis 5: Value determinants influence the frequency of internet banking usage.	Supported

and value dimensions and their association on consumers' usage of internet banking on a continued and frequent basis. In the order of prevalence, value, channel and technology dimensions were identified as antecedents to consumers' continued usage and frequency of usage of internet banking. Social dimensions did not exert any association with consumers' continued usage or their frequency of usage of internet banking. The findings from testing all the propositions mentioned above suggest that consumers' value perceptions were pivotal in determining their usage on a continual and frequent basis followed by channel and technology dimensions. Among the channel dimensions consumers' were more oriented towards safety and specialty aspects while performing internet based transactions. Also the relevant importance of the technology dimensions in influencing consumers' usage was related to consumers' attraction towards usability and trialability nature of the internet banking service delivery channel. The study has reinforced the importance of combining consumer decision making process, behavioral intention models and diffusion of innovations theories in order to obtain a comprehensive understanding of dimensions affecting consumers' continued usage and frequency of usage of internet banking. Notably, this study is one of only a handful of studies that have examined the consumers' usage behavior in an internet banking context.

Theoretically, the current study extended Black *et al.*, (2001) and Yousafzai *et al.*, (2005) by integrating the several theories in the internet banking research. Given the fact that prior internet banking research mainly examined factors responsible for consumers' intention to adopt and adoption of internet banking and factors hindering consumers' adoption of internet banking, this study investigated the dimensions responsible for the consumers' continued usage and frequency of usage of internet banking. Furthermore, in order to limit the threat of confounding research findings and conclusions, the present findings showed the importance of controlling for the influence of demographic characteristics on criterion variables. Actual predictive power of the predictor variables would have resulted in erroneous estimations if demographic characteristics were not controlled for hierarchical multiple regression and hierarchical logistic regression analyses. Moreover, this study is unique as it highlights the importance of integrated framework and a collaborative methodology.

The outcomes from the present study add value to marketing research and practice in a broader perspective to the Indian financial sector and more specifically to the Indian retail banking industry in several ways. Consumers' importance associated with the value dimensions to their continued as well as frequency of usage as evident from the quantitative findings indicates the attention that bank managers as well as bank marketers need to exert in provision of effective service delivery in an online environment. Channel dimensions such as perceived safety and perceived

Correlation statistics focus on characterizing relationships. Correlation measures the strength and direction of the relationship for the variables under consideration. In order to identify whether any linear relationship exists between attraction to usability, attraction to trial ability, perceived safety, perceived specialty, social and value dimensions, Pearson correlation was performed and the results are presented in TABLE 6.

### IX. CONCLUSION

The primary objective of the study was to investigate the dimensions that affect consumers' continued usage and frequency of usage of internet banking. This was accomplished by examining the technology, channel, social

specialty were found to significantly influence consumers, continued usage of internet banking. Banks need to develop strategies that will improve the consumers' trust in banking with the internet by development of secure policies and procedures, incorporation of secure mechanisms such as Secure Socket Layers (SSL), embracing encryption and firewall technologies, virus detection and protection measures, protective mechanisms including backup servers, and working coherently with online security firms which might reduce the perceptions of the consumers' that internet based service delivery channels as uncertain and unsafe (Hawkins *et al.*, 2000). Moreover, the intervention of the nations' government in provision of safety procedures related to consumers' banking transactions facilitate consumers' continued usage and enhance their frequency of usage of internet banking.

Confidentiality of the consumer essentially needs to be protected by the banks by implementing cryptography techniques (Patton 2004). During and after exchange of information between the consumer and the service provider, information content should be unchanged and tamper free through encryption and digital signatures. Information accessibility and availability by internet banking users whenever required is often to be ensured by the banks as reliable and authorized. Banks should provide proper measures to protect consumers' authentication and authorization regarding their internet based financial transactions through creation of passwords, and access control policies. Banks need to ensure non-repudiation measures such as confidentiality associated to information passed over the network during communication and stored at different locations through digital signatures and certificates issued to the internet banking users (Maijala 2000). Moreover, banks should protect consumers' privacy through various policies and disclosures. Consumers' risk orientations towards use of internet-based transactions could be reduced as banks engage in creating consumer awareness of safe internet banking and risk management procedures. Banks in future should demonstrate the ability to send personalized messages to their prospective and potential internet banking consumers eliciting them as unique customers and often retrieve consumers' feedback with regard to their service provision. Installation of voice prompts by bank management may create a sort of online personal help and thus attract more number of consumers to use internet banking. At this juncture banks need to take advantage of marketing communications in reaching their effective target group and further enhance their productivity and maximization of their profits.

The relevance of the technology dimensions emphasizes that the traditional focus of the banking management on bank employee-customer interaction issues need to be revised. Bank management essentially needs to reorient their focus on technology-customer interactions and effective management of the technology interface. Consumers,

attitudes towards internet banking service delivery channel would be different from those of traditional bank branches (Curran *et al.*, 2003). Therefore, bank management may opt for the interconnectedness of all the service delivery channels as there is a potential possibility that positive attitudes of consumers' towards an existing branch channel might create negative attitudes towards a proliferated electronic new distribution channels. In order to enhance consumers' positive attitudes towards internet banking, banks may need to publicize the advantages associated with the technology related internet banking interface. Banks could further highlight the importance of the user-friendly features associated with the internet banking in order to enhance consumers' perceptions towards the usability sub-dimension. The positive and significant impact of consumers' attraction to trial ability of technology associated internet banking service delivery channel and consumers' continued usage and frequency of usage of internet banking relate to the banks that they should provide step-by-step instructions, opportunity to test-drive the technological interface, and possible demonstrations on how to use internet banking effectively and efficiently. Banks need to embark on providing free training sessions to customers regarding the general use of computers and specific use of internet banking and educate them with the benefits associated with the internet banking usage.

One potential limitation associated with the current study is related to the reduced capacity to draw causal inferences that were inherent in the application of a survey type of research. The data for testing the conceptual model were obtained in a cross-sectional manner on a single occasion from a single source. Therefore the data collection method employed in this study had the potential for single source bias. Responses were obtained from only those respondents' who agreed to answer the questionnaire by interception in a shopping mall. Therefore the findings invite speculation with regard to causal relations concerns and further testing would be essential for verification. Also when conducting the analysis performed transformations of the variables that were found to be skewed in their distributions. Moreover, during hierarchical multiple regression and hierarchical logistic regression analyses in order to avoid any intervention of confounding and spurious relationships, demographic characteristics were statistically controlled for. Another limitation of this study is the use of self-report measures associated to consumers' perceptions, has the potential to confound findings due to common method variance. Although a limitation, nevertheless it was a convenient method that allowed the researcher to efficiently examine the large number of relevant variables from a wider sample. However, there was no sign of lack of discriminant validity the usual sign of common method variance among the principal constructs. Also self-report measures have been successfully used in the prior research (Yousafzai *et al.*, 2005). While aiming to

investigate the dimensions affecting consumers' continued usage and frequency of usage of internet banking, the strength of the research lay in the reliability and goodness-of fit measures of the final factors identified. Also the fact that most of the factors identified as a result of exploratory factor analysis exhibited consistency with the scale dimensions should increase the meaningfulness of these findings. However we expect that these findings will motivate internet banking researchers to test the specific relationships examined in this study using other possible reliable measures and procedures and can circumvent the problems associated with the use of self-reporting techniques.

The issue of generalizability is a limitation in most of the consumer behavior studies and the present study is no exception. The study has been conducted in India and specifically targeted the retail banking consumers' who were internet banking users and non-users. The resultant findings may vary with the application of the study to other banking contexts and other countries. Prior internet banking research indicated variation in the findings obtained when conducted in cross-cultural contexts (Unnithan and Swatman 2001). This may possibly explain why some of the theorized relationships between certain dimensions and consumers' continued usage and frequency of usage of internet banking did not materialize. Therefore the present study could not either rule out or rule in the predicted effects in these areas unequivocally. This issue could be attributed partly because of the complexities of the models tested, remains known.

This research studied only the consumers' usage determinants related to their continuity and frequency of internet banking in Delhi(Northern Part of India), leading to some unexpected findings partially contrary to extant theory. Therefore replication of similar research and samples would enhance our knowledge whether or not this absence of confirmation may be attributed to the industry related sample. The findings obtained from the study relate to the financial services sector, retail banking industry in general and specific to consumers' usage of internet banking. Future research should focus on other related service sectors such as tourism and hospitality and consumers' perceptions related to their continued and frequency of usage of relevant service providers' service which significantly add to the economic growth of the country. It is also imperative to study consumers' perceptions and usage dimensions of credit unions, building societies, and non-banking financial institutions and compare the findings with those of the retail banking industry would result in any similarities and differences. Future research could possibly encompass all the electronic service delivery channels in order to determine any variation in consumers' usage determinants persists. To avoid the previous concern for the source bias, future research should examine the relationship between the criterion variables and consumers, continued usage and frequency of usage of internet banking variables by

collecting these data from different sources at separate points in time to the extent possible and, over a longer period of time. This study compared various theories in terms of their explanatory capacities by application of an integrated framework and collaborative methodology. It is imperative that future studies develop more hybrid models in order to understand consumers' decision making and usage of various services in a more cohesive manner. Further research should examine the relevance of using mixed methodological approaches. Thus, future research should underpin the broad findings obtained from the present study and focus on investigating possible impact of situational variables that might of relevance in determining consumers' usage dimensions on a continual and frequent basis.

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**APPENDIX**

**Table 6: Correlation Statistics**

Variable	Attraction to usability	Attraction to triability	Perceived safety	Perceived specialty	Social dimension s	Value dimension s	
Attraction to usability	Corr.	1					
Attraction to trialability	Corr.	0.055		1			
Perceived safety	Corr.	0.425**	0.243**		1		
Perceived specialty	Corr.	0.024	0.251**	0.299**		1	
Social dimensions	Corr.	-0.142**	+0.267**	-0.293**		-0.057	1
Value dimensions	Corr.	0.482**	0.252**	0.588**	0.317**		-0.213**
							1