Technology Adoption Propensity of the Banking Customers in India: An Insight

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Abstract

The acceptance of the SSTs by the banking customers has been recognized as one of the crucial aspects in the success of SST implementation. The researchers, at various points of time and in different contexts, have highlighted the need for the identification of the factors affecting the acceptance of the SSTs. In this regard, technology adoption propensity of the customers and its relationship with socio-economic characteristics, technology attributes and facilitating conditions has been unveiled as the most important aspect. Taking this into consideration, the present paper has been framed to analyze technology adoption propensity of the customers in India by focusing on the three aforementioned facets. Accordingly, the results have highlighted significant association of age, income and qualification of the customers with their propensity to adopt technology. Also, significant connection of technology adoption propensity of the customers with facilitating conditions, perceived usefulness and perceived ease of use has also been unveiled from the results of the study. Based on the findings, the study has recommended the need for framing strategies focusing on the three aforementioned facets as an effective measure for enhancing acceptance of the SSTs among the customers in India.

Keywords: Technology adoption propensity; perceived usefulness; perceived ease of use; customer acceptance of technology

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Introduction

The use of the technologies has brought radical transformation on the landscape of banking industry. It has laid the foundation of cost-effective quality offerings which not only enhances customer satisfaction but also adds to the banks' profitability. Recognizing the impact of technology, banks have intensified the use of technology for almost all the banking operations ranging from cash deposit/withdrawal to loan application, etc. Among such technologies, the most effective and efficient technology that has enabled banks to transcend from traditional brick-mortar structure to virtual system are the self-service technologies (SSTs) (Khraim et al., 2011). SSTs have been defined as the technologies which allow direct customer interface with the technology (Meuter et al., 2000) and includes include ATMs, internet banking and mobile banking. With the use of the SSTs, customers can not only access their bank accounts but they can also carry out their banking transactions anytime and anywhere irrespective of the banking hours (Parasuraman, 2000). This has enabled banks in enhancing the convenience of the customers as an effective measure to enhance their satisfactions level (with the ultimate aim of increasing banks' profitability). Although banking sector has witnessed augmented growth in their profitability levels with the use of SSTs (Lal and Saluja, 2012), yet the statistics have confirmed disparity between the augmented growth and the projected growth for which the main reason identified was the acceptance of the SSTs by the banking customers (Kanal, 2014). Consequently, attempts have been made to explore the factors having impact on acceptance of the SSTs by the customers. Among such factors, technology adoption propensity of the customers has been identified as one of the most prominent factor affecting the decision of the customers to adopt SSTs (Al-Samadi, 2012). Technology adoption propensity has been defined as the personal disposition of the customers influenced by the value and belief system followed by the customers (Ratchford and Barnhart, 2011). Further, the identification of technology adoption propensity as significant determinant of technology adoption decision of the customers has called for the need of exploring technology adoption propensity of the customers including various facets linked with it. In this context, the catalog of such factors unveiled three crucial facets, namely, socio-economic characteristics (Auzozi, 2009), technology attributes (Davis, 1989) and facilitating conditions (Venkatesh et al., 2003). Taking into account these facets, the present paper has been structured to explore technology adoption propensity of the banking customers in India focusing on the three aforementioned facets found to be associated with it. For that purpose, the next section discusses the research conducted in this connection.

Previous Research

The existing literature has put emphasis on the association between socio-economic characteristics and technology adoption propensity of the customers. In this regard, researchers, such as, Gilly and Zeithaml (1985); Oumil and Williams (2000); Azouzi (2009), etc. have highlighted significant association of the age of the customers with their technology adoption propensity. Usually, younger customers have high technology adoption propensity owing to the fact that being high risk takers, they engage themselves in learning aobut new and improved technologies (Nilsson, 2007). But mature customers are more resistant to technology adoption owing to their strong beliefs

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developed over the time (Mattila et al., 2003; Laukkanen et al., 2007). Further, technology adoption propensity also found to have positive correlation with educational background of the customers (Ndubisi, 2005; Auzozi, 2009). Higher educational background leads to the enhancement of abilities of the customers (Meuter et al., 2005; Kim et al., 2011, thereby, shaping their propensity to adopt technology. Alike education, income of the customers also found to have significant connection with technology adoption propensity of the customers (Hernandez and Mazzon, 2006). Customers with high income have high risk taking ability owing to which their propensity to adopt technology also rises (Tater et al., 2011; Bamoriya and Singh, 2012).

Together with socio-economic characteristics, facilitating conditions has also found to be connected with the technology adoption propensity of the customers (Yu, 2012). In this regard, previous studies have highlighted that the technology adoption propensity of the customers will be more if they are provided with some external support (like technical support or support of the organizational personnel) (Al-Gahatani et al., 2007; Dwivedi et al., 2008). Also, the propensity of the customers to adopt technology found to be dependent on the extent to which the technology is compatible with the existing work style of the customers (Kharahanna et al., 2006; Bouten, 2008).

Further, Lin et al. (2005 & 2007) integrated technology adoption propensity with technology attributes, namely, perceived usefulness and perceived ease of use (as specified by Davis, 1989) and unveiled positive association of technology adoption propensity with technology attributes. Customers with high technology adoption propensity perceive technology useful and easy to use owing to which they decide to adopt the technology (Walczuch et al., 2007; Erdogmus and Esen, 2011; Berndt et al., 2010, Guhr et al., 2013). Also, Uncu (2014) has validated significant correlation between the propensity of the customers to adopt the technology and various attributes associated with technology by stating that personal traits of the customers shapes their perception regarding perceived usefulness and perceived ease of use.

Briefly, the review of the literature underlines noteworthy relationship of technology adoption propensity of the customers with socio-economic characteristics, technology attributes and facilitating conditions. Despite of the extensive research in this field, the existing literature falls short in analyzing the aforementioned association with reference to developing countries like India. Further, the relationship of facilitating conditions with the technology adoption propensity of the customers has been relatively neglected. Moreover, the studies also lack in exploring relationship between socio-economic characteristics and the technology adoption propensity of the customer as much of the studies have focused on the relationship of socio-economic characteristics either with the technology attributes or with the technology usage behavior. It is with these backdrops in mind that the present study has been designed to figure out the connection of technology adoption propensity of the banking customers in India with their socio-economic characteristics, technology attributes and facilitating conditions.

Data Base and Research Methodology

Sample Design

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Keeping the purpose of the study in consideration, the present study includes representative sample of the banking customers of India by applying multi-stage random sampling approach. Accordingly, the data has been collected from 12 different cities of India. For that purpose, initially, per capita net State Domestic Product (PCNSDP) at factor cost (current prices) for the year 2012-13 for the twenty-seven states as published by Central Statistics Office (CSO) has been considered (as data was available for twenty-seven states only at the time of data collection). All the twenty-seven states have been arranged according to their PCNSDP and categorized into four groups from which three states have been randomly chosen. Further, out of the selected states, city with highest gross state domestic product (GDP) has been chosen for the purpose of data collection. Accordingly, 12 cities, namely, Mumbai, Hyderabad, Lucknow, Delhi, Bhopal, Gurgaon, Jammu and Kashmir, Shimla, Bhubaneshwar, Agartala, Imphal and Itanagar have been chosen. The data has been collected during the period from November, 2013 to May, 2014. A total of 1320 number of responses from the 12 selected cities of India have been collected out of which 119 responses have been removed owing to reasons such as non-response, incomplete responses, etc. Accordingly, the present study includes usable sample of 1201 banking customer in India.

Measures

For identifying technology adoption propensity of the customers, initially, 47 item five point Likert scale (wherein 1 indicates 'never' and 5 indicates 'always') has been developed. To develop this scale, the research work done by Parasuraman (2000); Ratchford and Barnhart (2011); Compeau and Higgins (1995), Agrawal and Prasad (1998); Venkatesh et al. (2003); Venkatesh and Davis (2000); Limayem and Hirt (2003), Smith et al. (2008), Bartone et al. (1989); Windle et al. (2008); Bagozzi and Dholakia (1999) and Kim et al. (2005); Fishbein and Ajzen (1975) and Ajzen (1991) has been referred. Further, technology attributes includes two dimensions, namely, perceived usefulness and perceived ease of use. Perceived usefulness has been defined as the degree to which customers believe that the use of the SSTs would be beneficial and enhance the effectiveness of customers in conducting their banking transactions. To access perceived usefulness, 5–item scale has been developed based on the work done by Davis (1989) and Moore and Benbasat (1991). Further, perceived ease of use has been defined as the degree to which customers believe that the use of the SSTs would be free of any kind of mental and physical effort and it has been accessed through a scale developed from the research conducted by Davis (1989) and Venkatest et al. (2003). The responses of both perceived usefulness and perceived ease of use have been taken on seven point likert scale (where 1 represents strongly disagree and 7 represents strongly agree). Furthermore, facilitating conditions has been defined as the degree to which customers believe that organizational and technical support exists to support the use of SSTs and it has been accessed using six items anchored on five point likert scale (wherein 1 depicts strongly disagree and 5 depicts strongly agree). The construct has been developed by referring the work done by Venkatesh et al. (2003); Moore and Benbasat (1991); Thompson et al. (1991) and Taylor & Todd (1995a; 1995b). Besides, the information pertaining to the socio-economic background of the respondents has been accessed through a series of questions.

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Further, the constructs developed have been tested against normality, reliability and validity norms. To analyze data normality, descriptive statistics have been examined. The values of standard deviation; skewness and kurtosis falls in acceptable range (that is, standard deviation has been reported close to one and skewness & kurtosis lies within the range of +3 to -3 as specified by Hair et al. (2011), thereby, depicting about data normality. Further, the item-to-item correlation and cronbach's alpha statistics has been employed to purify the constructs wherein the correlation statistics has depicted significant correlation between items representing same construct. However, based on the Cronbach's statistics, two items have been deleted from the construct of technology adoption propensity (based on 'If item deleted criterion'), thereby, reducing to 45 item scale. Likewise, one item from the construct of facilitating conditions has also been deleted based on Cronbach's alpha statistics, whereas, no item has been deleted from the scale representing perceived usefulness and perceived ease of use. Furthermore, the values of Cronbach's alpha for all the four aforementioned constructs ranges from 0.80 to 0.95, thereby, depicting internal consistency of the items assessing the representative constructs. Also, the dimensionality of the constructs has been tested by employing exploratory factor analysis (EFA). For that purpose, with minimum cutoff of 0.50 (Hair et al., 2011) with principal component analysis following varimax rotation approach has been performed on all the four aforementioned scales. Accordingly, the results have highlighted that the measure of sampling adequacy were strong as the value of KMO has been reported to be far above the acceptable range of 0.5(Field, 2005). Further, the statistics pertaining to Bartlett's test of sphericity has highlighted significant results as represented through significant Chi-square statistics value (p<0.01). Furthermore, the communalities statistics, for the items depicting the aforesaid four constructs, has been reported to be above the prescribed limit of 0.50. Also, the analysis of latent root criteria (i.e. eign value = or > 1) has resulted into single factor solutions in case of all the four aforementioned constructs for which cumulative variance equals to 78.076 per cent; 86.845 per cent; 88.166 per cent and 80.066 per cent in case of technology adoption propensity, perceived ease of use, perceived usefulness and facilitating conditions respectively, thereby, establishing dimensionality of all the four constructs.

Besides, to serve the purpose of the present study, sampled respondents have been categorized into two groups, that is, respondents with high technology adoption propensity and those with low technology adoption propensity. For that reason, the aggregate score of technology adoption propensity of each respondent for all the different dimensions related to technology adoption propensity has been calculated. This aggregate score is used to estimate the Z-score for which each respondent has same mean (mean=0) and standard deviation (S.D.=1) wherein positive values indicate respondent with high technology adoption propensity and negative values indicate respondent with low technology adoption propensity. Further, the two independent sample t- test is applied to identify whether a significant difference exists between the two categories of customers segregated based on their technology adoption propensity for which the results were found to be statistically significant at 1 per cent level of significance (refer Table 1).

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Table 1 Results of Independent t-test for technology adoption propensity

Variable	N	Mean	t-value
High Technology Adoption Propensity	595	158.98	389.63*
Low Technology Adoption Propensity	606	128.66	

Note: *significant at 1 per cent level of significance

The present study has employed chi-square and t-test statistics to analyze the presence of difference between the technology adoption propensity of respondents across socio-economic characteristics, technology attributes and facilitating conditions. To analyze, SPSS version 18 has been used. Accordingly, the sample profile of the respondents indicates that majority of the respondents were males belonging to age group of 31-40 years. Majority of them were graduates and are employed in various public and private organizations with family monthly income ranges of INR 1, 00, 000 to 2, 00,000 per month.

Empirical Analysis

Socio-economic characteristics and technology adoption propensity

The socio-economic characteristics, namely, age, income and education have been taken to analyze for its association with technology adoption propensity of the customers. The null hypothesis set for the same is:

$H_{0.1}$: *There is no significant difference between the technology adoption propensity of customers and the socio-economic characteristics.*

Table 2 Association of Age, Income and Qualification with Technology Adoption Propensity

Socio-Economic Factors	High Technology Adoption level (N= 595)	Low Technology Adoption level (N= 606)
Age (in years)*		
21-34	353	319
34-58	242	287
Income (in Rs.)**		
10000-120000	232	375
120000-700000	363	231
Qualification*		
Graduation and below Graduation	292	244
Above Graduation	300	362

Note: 1. Source: Primary Source
*2. *= Chi-square with 1 df = 5.448, p<0.05*
*3. **= Chi-square with 1 df = 62.926, p<0.01*
*4. ***= Chi-square with 1 df = 10.532, p<0.01*

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To analyze difference in technology adoption propensity of respondents on account of age, income and qualification as the data assessing these socio-economic characteristics, chi-square statistics has been employed. Accordingly, the results are represented in Table 2 which states that all the three socio-economic characteristics (age, income and qualification) are significantly related with the technology adoption propensity of the respondents (the chi-square values have been reported to be statistically significant in all the three cases). The results have highlighted that younger respondents have high technology adoption propensity whereas in case of mature respondents (i.e. 34-58 years of age) technology adoption propensity found to be low. The findings are in convergence with the earlier studies conducted by researchers, such as, Gilly &Zeithaml (1985); Morris et al. (2005); Argrawal and Prasad (1999), etc. who have highlighted that the technology adoption propensity of the customers has inverse relationship with age, i.e. the propensity to adopt technology decreases with the increase in the age of the customers.

Further, the Table 1 has also depicted significant association of technology adoption propensity of the customers with their monthly family income. It indicates that majority of the respondents with high technology adoption propensity belong to higher income group (i.e. Rs.120000 - Rs. 700000), whereas, majority of the respondents having low technology adoption propensity falls in relatively low income group (i.e. Rs. 10000-Rs. 120000). In this regard, Hitt and Frei (2002) and Van Ittersum et al. (2006) have also stated that technology adoption propensity has positive relationship with income of the customers.

Also, the frequency distribution of relationship between technology adoption propensity and qualification level of the respondents (refer Table1) has represented that majority of the respondents having high propensity to adopt technology are either post-graduates or have qualification above that. Conversely, majority of the respondents with low technology adoption propensity are either graduates or undergraduates. These findings correspond the findings of the study conducted by Van Ittersum et al. (2006) wherein it has been highlighted that technology adoption propensity has positive relationship with the qualifications of the customers.

The above discussion clearly depicts statistically significant difference between the technology adoption propensity of customers on account of age, income and qualification of the respondents and hence, null hypothesis ($H_{0.1}$) has been rejected.

Technology Attributes, Facilitating Conditions and Technology Adoption Propensity

The technology adoption propensity of the customers shapes the perception of the customers towards technology characteristics. Customer perceived technology useful as well as easy to operate if they have high propensity towards technology adoption (Walczuch et al., 2007). With this representation, the relationship between technology adoption propensity and technology attributes, namely, perceived usefulness and perceived ease of use has been accessed. Accordingly, the null hypothesis set to serve this purpose includes:

$H_{0.2}$: There is no significant association between technology adoption propensity and perceived usefulness.

$H_{0.3}$: There is no significant association between technology adoption propensity and perceived ease of use.

Further, researchers, such as, Al-Gahatani et al. (2007); Dwivedi et al. (2008), etc., have highlighted significant association of technology adoption propensity of the customers with the facilitating conditions. Hence, null hypothesis set for analyzing the case is:

$H_{0.4}$: There is no significant association between technology adoption propensity and facilitating conditions.

Table 2. Perceived usefulness, perceived ease of use, Facilitating Conditions and Technology Adoption Propensity

Variables			t-test for Equality of Means			
	Technology Adoption Propensity	Mean		F-value	t-value	df
Perceived Usefulness	Low	5.47	Equal variances assumed	278.44*	-13.60*	1199.00
	High	6.23	Equal variances not assumed		-13.70*	758.90
Perceived Ease Of Use	Low	5.48	Equal variances assumed	286.86*	-13.32*	1199.00
	High	6.21	Equal variances not assumed		-13.41*	777.04
Facilitating Conditions	Low	2.77	Equal variances assumed	1.18	-2.14**	1199.00
	High	2.92	Equal variances not assumed		-2.14**	1198.02

Note: 1. Source: Primary Source
*2. *significant at 1per cent level, **significant at 5 per cent level*

To test $H_{0.2}$, $H_{0.3}$, $H_{0.4}$, independent t-test statistics has been employed. The results (refer Table 2) point out that respondents with high technology adoption propensity includes those who consider technology more useful as depicted by the high mean score (high mean score indicates that the technology has been perceived more useful). Whereas, respondents with low technology adoption propensity includes those who consider technology relatively less useful. The difference between two categories of customers on account of perceived usefulness is found to be statistically significant. The findings support the existing literature which has highlighted that the extent to which customers perceive technology useful depends on their propensity to adopt the technology. This is in congruence to the findings of Lin et al. (2005). Further, the results also highlights statistically significant difference among the respondents possessing varied propensity to adopt technology on account of perceived ease of use involved in

technology usage. Respondents having high technology adoption propensity includes those who perceive technology relatively more ease to use than the respondents with low technology adoption propensity (as the mean score is found to be low in case of respondents with low propensity to adopt the technology). The results are in convergence with the study conducted by Lin et al. (2007). Furthermore, respondents with high technology adoption propensity have reported high mean on facilitating conditions, thereby, revealing that respondents, who are provided with some kind of support, such as, technical support or organizational support, usually have high technology adoption propensity and vice-versa and the results are found to be significant at 5 per cent level of significance. The findings correspond with the existing literature which states that technology adoption propensity of the customers depends on the conditions within which the technology has to be operated (i.e. presence of facilitating conditions) (Venkatesh et al., 2003).

Implications and Conclusions

The present composition underlines noteworthy association of technology adoption propensity of the banking customers with their socio-economic characteristics, technology attributes and facilitating conditions. More specifically, the study has documented the existence of difference in the technology adoption propensity of the banking customers on account of socio-economic characteristics (age, income and qualification), technology attributes (perceived ease of use and perceived usefulness) and facilitating conditions. The results have unveiled that the technology adoption propensity of the customers has negative association with the age of the respondents. The underlying reason can be that respondents younger in age are more fervent to try new and improved technologies. Generally, they are highly optimistic, innovative and high risk takers which may induce them to try new and improved technologies. Conversely, mature customers have high resistance towards change owing to their strong belief system developed over the period of time which may be the underlying reason for their low technology adoption propensity. Further, it has also been identified in the study that the technology adoption propensity of the respondents differs on account of their income level. This can be due to the fact that respondents with high income have more finances (money) at their disposal. This may enhance, their risk taking ability enhances which, in turn, raises their technology adoption propensity. Whereas, low income respondents have low technology adoption propensity due to the availability of limited resources (money) at their disposal. Due to it they may become selective while spending on the technology. Besides, qualification of the respondents also found to have significant association with their technology adoption propensity. The results have highlighted that technology adoption propensity of the respondents is associated with their qualification. The underlying reason for it can be that qualification enhances skills and mental ability of the customers. It boosts self confidence of the customers owing to which they explore and adopt new and improved technologies. On the contrary, individuals with low qualification are not found to be more skillful and self confident which restrain their tendency towards technology adoption. The present study also explores significant association between technology adoption propensity of the customers with facilitating conditions. It may be due to the reason that the presence of some kind of support (such as, technical or organizational support) will make the use of

the technology easier for the customers owing to which their tendency to adopt technology also enhances.

Further, the present study also highlights significant association between technology adoption propensity of the respondents and technology attributes, namely, perceived usefulness and perceived ease of use. The results have stated that respondents with high technology adoption propensity perceive technology useful and easy to use. Usually customers with high technology adoption propensity have the tendency of learning about new and improved technologies which in turns, make them aware regarding the benefits of the technology and hence, they may consider technology useful. Further, the tendency of the customers(having high technology adoption propensity) to search out for the new and improved technologies as well as their high self-efficacy makes the use of the technology ease for them and this can be attributed to the fact that customers with high technology adoption propensity consider technology ease to use.

The findings of the study have imperative implications for both the academicians as wells as banks. The present composition provides a framework for understanding various aspects related with the technology adoption propensity of the banking customers in India. The pattern results have suggested that socio-economic characteristics have important ramifications on the technology adoption propensity of the banking customers. Consequently, there is a need to develop and implement strategies that can recognize these individuals differences. Age, income and qualification have been found to shape technology adoption propensity of the customers and hence, can be used as indicators for scrutinizing technology adoption behaviour of the customers. Further, these socio-economic characteristics can also facilitate banks in targeting the most profitable segment (like young customers or high income group customers) for their existing as well as upcoming technologies. Also, the association of facilitating conditions with technology adoption propensity has highlighted the need to focus on facilitating factors, such as, technical or personnel support, etc. as an effective measure to enhance the technology adoption propensity of the customers. Not only this, the significant association of technology adoption propensity with technology attributes also emphasizes that banks should focus on enhancing the technology adoption propensity of the customers by devising appropriate strategies so that customers perceive technology useful and easy to use, thereby, developing positive attitude towards technology acceptance. It, in turn, will induce customers to adopt the technology. All this will, eventually, lead towards the accomplishment of banks' objective, that is, enhanced profitability through increase technology adoption and usage by the banking customers.

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