

Measuring Technology Readiness: The Bank Personnel Perspective

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To be in the world-wide race of technology-excellence, a host of Indian banking organizations have moved towards leveraging emerging technological solutions into their banking operations. But, it will be of no use to make huge investment in technological upgradation & advancements until and unless contact employees accept and integrate the technologies into their work life. Acceptance of technology on the part of these employees is of paramount importance since they are the main people to interact with external customers and to assist the customers experiencing problems with the self-service technologies, and they play key role in external customer relationship. Therefore, attitude towards technology among the contact employees need to be better understood if the banks are to position in the customers' mind. However, research in this area is still quite sparse. Against this backdrop, the present study attempts to assess contact employees' readiness to embrace and use technology-interface across public sector and private sector banks in Indian context. To achieve this objective, it employs TRI (Technology Readiness Index) scale (Parasuraman, 2000). Finally, it highlights potential avenues for future research.

Introduction

In recent years, Indian banking industry in its quest to adjust itself to the new market dynamics, to combat escalating competition posed by evolving global banking environment and to cater to varied and changing needs of customers are catching up fast to implement large-scale technological solutions into its banking operations. Unlike past, the use of information technology is no longer confined to automation of accounting and back office operations. At present, technological advancements all set to change the way the banking organization delivers its products and services to the customers so as to provide them with the facility of anybranch, anytime and anywhere banking than ever before. Introduction of core banking solution (CBS), ATM, internet banking, mobile banking and e-payment mechanisms i.e. NEFT (National Electronic Fund Transfer) and RTGS (Real Time Gross Settlement System) etc. by banking organizations is a step towards enhancing customer convenience through anytime and & anywhere banking and positioning themselves strategically in the marketplace. There is considerable amount of evidence confirming that these modern e-banking solution has emerged as the key resource for facilitating customization of banking transactions to suit the customer appetite, achieving cost advantage, enhancing operational efficiency and improving competitiveness (Bauer

et al., 2005; Brown and Molla, 2005; Parasuraman et al., 2005; Pikkarainen et al., 2006; Suganthi et al. 2001). However, if bank employees do not accept and integrate the technologies into their work life, how can they recommend and promote these e-banking services and facilitate customers to use them? This, in turn, will make it difficult for the banking organization to stay ahead in competition and accrue the benefits embedded in the technological advancements. It is in this perspective; the present study seeks to measure bank employees' propensity to embrace technology into their work life in the Indian context with special reference to public and private sector banks. There is empirical evidence from the existing literature that technology readiness correlates with actual use and intention to use the technology (NTRS, 1999; NTRS, 2000; NTRS, 2001). The recommendations provided in this paper are useful for Indian banks and for the banks of developing countries like India in the light of providing answer a variety of questions germane to the banks' technology strategies and to the effective management of employee-technology link.

The paper is structured into eight sections. After having the introduction in section 1, section 2 presents a brief review of existing research studies dealing with employees' attitude towards the e-banking solutions, critically evaluating them, both conceptually and methodologically. Section

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3 reports the conceptual framework of the study. Section 4 presents the research methodology used in this work. Section 5 sheds light on the results of the study with a discussion. Section 6 concludes the paper. Section 7 pinpoints managerial implications of the present study. Finally, it reports limitations of the study and suggests potential future research directions.

Review of Existing Literature

While going through review of previous research findings, the researcher found that there are series of studies dealing with customers' perspective towards e-banking, but seldom research studies (Afrouz,

2006; Al-Hajri and Tatnall, 2007; Asgharpour, 2006; Kaleem and Ahamd, 2008; Kumar and Kumar, 2004; Kumar et al., 2008; Mashhour and Zaatreh, 2008; Mia et al., 2007; Nath et al., 2001; Rawani and Gupta, 2002) have been geared towards examining bank employees' attitude towards the implementation of technological solutions into the banking operation. Furthermore, most of these studies fall short of revealing the state of bank staffs' technology readiness. The present paper attempts to fill these research gaps by assessing level of technology readiness of bank employees of both public and private sector banks and thereby providing banking authority an insight about successfully managing employee-technology-customer linkage.

Table 1: Summary of Studies Dealing with Bankers' Attitude towards the Implementation of E-Banking

Study	Research Setting (s)	Tools of Data Analysis	Findings
Nath et al. (2001)	U.S.	Mean-Score Analysis	The study identified that bankers view internet banking as a strategic opportunity for reducing transaction costs, enhancing customer service, increasing the customer base and improving cross-selling opportunities. It, further, reported that internet banking was being perceived more favorably by those banks that offer it as compared to those that do not offer.
Rawani and Gupta (2002)	India	Strategic Grid	The study found that IS (Information System) plays a supportive role in public sector banks and strategic role in private and foreign sector banks.
Kumar and Kumar (2004)	India	Descriptive Analysis	The study concluded that public sector banks' staff was negative towards computerization at the time of introduction of computerized systems in banks. But soon they were convinced by banks through providing them proper training to handle computers and via dictating them various benefits of computerization. The study generalized that in the present scenario, there is no problem regarding resistance of computerization in banking industry.
Afrouz (2006)	Iran	PLS (Partial Least Square)	The study found relative advantages and perceived self efficiency to be significant

Asgharpour (2006)	Iran	TRI (Technology Readiness Index)	predictors of behavioral intentions to implement e-banking in respect of both types of banks. The study concluded that elite communities of Iran were comparatively more techno-prone and optimist about technology. They did not feel insecurity and most of them perceived technological products easy to operate.
Al-Hajri and Tatnall (2007)	Oman and Australia	Content Analysis	The findings of the study indicated that banks of both the countries i.e. Oman and Australia perceived advantages of the technology. However, Oman bank managers considered internet as obstacle in the way of loyalty of customers.
Mia et al. (2007)	Dhaka	Content Analysis	The study concluded that e-banking has opened up new vista of opportunities to serve vast geographical market, to improve customers' service, to reduce costs etc. for existing banks and financial institutions.
Kaleem and Ahamd (2008)	Pakistan	Mean-Score Analysis	The study identified that Pakistani bankers' perceived e-banking as tool for minimizing inconvenience, reducing transaction costs and saving time on one hand. On the other hand they perceived that e-banking increases chances of fraud.
Kumar et al. (2008)	India	Frequency Analysis	The study found young employees to be having more openness to change and more familiarity with the technology.
Mashhour and Zaatreh (2008)	Jordan	Descriptive Analysis	The study identified that IS (Information System) significantly influenced performance of the banking system.

Conceptualization of The Study

Parasuraman (2000, p. 308) defined technology readiness as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work".

To study the bank employees' level of technology readiness, the study employs TRI (Technology Readiness Index) (Parasuraman, 2000). It is worthy to note that Parasuraman and Colby (2001) emphasized that technology readiness (TR) doesn't just refer to possessing technical skills; TR is much more a function of people's beliefs and feelings about technology. TR consists of four facets or dimensions (Parasuraman, 2000):

Optimism: A positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives.

Innovativeness: A tendency to be a technology pioneer and thought leader.

Discomfort: A perceived lack of control over technology and a feeling of being overwhelmed by it.

Insecurity: Distrust of technology and skepticism about its ability to work properly.

Of these four dimensions, optimism and innovativeness are drivers of technology readiness,

whereas discomfort and insecurity are inhibitors. Relative strength of these positive and negative beliefs collectively determines peoples' receptivity of technology.

Based on the TRI scores, people can be meaningfully segmented into five distinct technology readiness segments, namely, (i) Explorers, (ii) Pioneers, (iii) Skeptics, (iv) Paranoids and (v) Laggards (Parasuraman and Colby, 2001). These different TR segments can be described as follows (table 2):

Table 2: Characteristics of TR Typologies

TR Typologies	Typologies Characteristics
Explorers	Extremely high in technology readiness, ranking higher on driver and lower on inhibitors of adoption. They are easy group to attract when a new technology is introduced; they will comprise the first wave of customers
Pioneers	Desire the benefits of the new frontier but more practical about the difficulties and dangers. Pioneers share the optimism and innovative tendencies of the explorers.
Skeptics	They do not believe strongly in technology and lack any desire for pure innovation.
Paranoids	Convinced of the fruits but unusually concerned about the risks. A Paranoid is like a child encountering a burning candle for the first time. The fame is fascinating, but also frightening and painful to touch.
Laggards	Never move unless are forced to do so. They opposite of explores are ranking lower in motivation and higher in inhibition than the market as a whole.

Source: Parasuraman and Colby (2001)

Notable, explorers followed by pioneers are high in technology readiness and tend to embrace new technology earlier than the others (Parasuraman and Colby, 2001; Rogers, 1995). By dividing their employees into the said TR clusters, the banking

organization can better understand their TR profile.

Research Methodology

Sample Design

The present study is exploratory in nature. This study have been conducted with reference to four Indian scheduled commercial banks, of which two belong to public sector, namely, State Bank of India (SBI) & Punjab National Bank (PNB), and two belong to private sector, namely, ICICI bank & HDFC bank. The selection of these banks for the project as study units has been made using judgmental sampling i.e. on the basis of their being the dominant and leading banks in their respective categories. From each of the bank identified, 30 employees have been selected and thus making the total number of the respondents to 120 for the study. To gather the data from the respondents, the present study carried out a questionnaire survey within the geographical area of Rohtak, Panipat, Gurgaon in North India during July-December 2009. The target location has been the CBS branches of the banks under investigation. The respondents of the survey, contacted, were branch manager, customer relationship manager and other front-line staff, who have been working in the concerned banks' CBS branches.

Survey Instrument

To collect data from the target respondents a well structured self-administered questionnaire has been developed that includes two sections. Section one includes nominal-scaled questions, obtaining information about respondents' characteristics including gender, age, education, and years of work experience. Section second includes 10 items, measuring the respondents' technology beliefs on four different technology readiness dimensions, namely, Optimism, Innovativeness, Discomfort, Insecurity (table 3). These items were adopted from the technology readiness index of Parasuraman and Rockbridge Associates Inc. with written permission. Each of these items is evaluated on 5-point Likert scale, ranging from strongly disagree (score 1) to strongly agree (score 5). The possible range of scores is 1 to 5 with 3 as a "natural" point and higher scores reflecting high degree of agreement.

Table 3: Description of Measures

Construct	Item No.	Corresponding items
Optimism	1	You find new technologies to be mentally stimulating.
	3	You like computer programs that allow you to tailor things to fit your own needs.
Innovativeness	5	Other people come to you for advice on new technologies.
	7	You can usually figure out new high-tech products and services without help from others.
	9	In general, you are among the first in your circle of friends to acquire new technology when it appears.
Discomfort	8	When you get technical support from a provider of a high-tech products or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do.
	10	It is embarrassing when you have trouble with a high-tech gadgets while people are watching are you.
Insecurity	2	If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place.
	4	You do not consider it safe to do any kind of financial business online.
	6	You worry that information you send over the Internet will be seen by other people.

Source: These questions comprise the Technology Readiness Index which is copyrighted by A. Parasuraman and Rockbridge Associates, Inc., 1999. This scale may be duplicated only with written permission from the authors.

Procedure

Before conducting the main survey a pilot study on the sample of 30 has been performed comprising of both public sector and private sector banks' participants via personal interview method to confirm the face validity and reliability of the questionnaire. The results of pilot study showed that items are easy to understand. However, certain modifications regarding formatting of questionnaire have been undertaken to make it look shorter. The finalized questionnaire has then been issued to a total of 120 respondents selecting 60 from each respective bank categories i.e. public sector and private sector bank groups as per the guidelines of current sample design. Researcher personally distributed the questionnaires among the targeted bank employees at their respective banking premises and made personal visits to collect the filled questionnaires.

Data Collection

Out of the total 120 questionnaires distributed, 103 usable questionnaires were collected, resulting in 85.8% valid response rate. Of the 103 respondents 48 respondents have been found belonging to public sector banks and 55 to private sector banks.

Tools of Data Analysis

To answer the research question concerned with assessing employees' readiness to interact with new e-banking technologies in the selected bank categories, the present study computes the average for each of the four dimensions i.e. Optimism, Innovativeness, Discomfort and Insecurity. Thereafter, it computes overall TRI (Technology Readiness Index) score for both of the bank groups as follows:

$$\text{TRI} = [\text{Innovative} + \text{Optimism} + (6 - \text{Discomfort}) + (6 - \text{Insecurity})] / 4$$

Further, the study attempts to classify the employees into five different TR segments (i.e. Explorers, Pioneers, Skeptics, Paranoids and Laggards). This classification is undertaken by computing the TRI score of each employee based on the guidelines set up by Parasuraman and Colby (2001) as (1+3+5+7+9) questionnaire items - (2+4+6+8+10) questionnaire items. If the employee's index score

is within 8 to 16, the employee will be considered as Explorer. If the employee's index score is within 1 to 6, the employee will be considered as Pioneers. When the employee's index score is between 0 to -4, then would be considered as Skeptics. However, if the employee's index score is between -6 to -8, the employee will be considered somewhat techno-resistant and classified as Paranoids. When the employee's index score is between -10 to -16, then the employee will be considered as highly techno-resistant and be identified as Laggards.

Analysis and Discussion

Profile of Surveyed Bank Employees: Table 4 depicts the profile of bank employees surveyed.

It is evident from the table 4 below, that out of the total responses received (n=103), 48 are of public sector banks and 55 are of private sector banks. It further reveals that private sector banks' employees are relatively young with 56.3% of them in the age group of below 30 years as compared to public sector banks where only 20.9% of the survey respondents lies in the corresponding age group. Male dominates the sample in both groups of banks. In case of education, private sector banks seem to be having major chunk of professional degree holders (26.2%) as against public sector banks (8.7%). In case of year of work experience, on the whole, sample almost uniformly comprises respondents from different experience period.

Table 4: Profile of Surveyed Bank Employees

Particulars	Classification	Public Sector Banks		Private Sector Banks		Overall	
		Count	%	Count	%	Count	%
Age Group	Below 21 yrs	3	6.3	7	12.7	10	9.7
	21-30 yrs	7	14.6	24	43.6	31	30.1
	31-40 yrs	12	25	11	20	23	22.3
	41-50 yrs	16	33.3	8	14.6	24	23.3
	Above 50 yrs	10	20.8	5	9.1	15	14.6
Total		48	100	55	100	103	100
Sex	Male	32	66.7	30	54.5	62	60.2
	Female	16	33.3	25	45.5	41	39.8
Total		48	100	55	100	103	100
Highest Education qualification	Under Graduate	5	10.4	2	3.6	7	6.8
	Graduate	22	45.8	12	21.8	34	33.0
	Post-Graduate	12	25	14	25.5	26	25.2
	Professional Degree	9	18.8	27	49.1	36	35.0
Total		48	100	55	100	103	100
Year of Work Experience	Less than 5 yrs	2	4.2	13	23.6	15	14.6
	5-10 yrs	3	6.3	16	29.1	19	18.4
	11-15 yrs	16	33.3	11	20	27	26.2
	16-20 yrs	17	35.4	10	18.2	27	26.2
	Above 20 yrs	10	20.8	5	9.1	15	14.6
Total		48	100	55	100	103	100

Source: Primary Data

Technology Readiness

Table 5 depicts the mean scores of bank employees in both groups of banks for TRI and its dimensions.

Table 5: Descriptive Statistics for Technology Readiness Index and its Dimensions in Public and Private Sector Banks

Parameters	Public Sector Banks Mean Score	Private Sector Banks Mean Score
Optimism	3.572	3.600
Innovativeness	3.000	3.109
Discomfort	2.385	1.081
Insecurity	2.055	2.024
Overall TRI	3.533	3.900

Source: Primary Data

It is observed from the table 5 that employees in both public and private sector banks tend to be quite positive towards the implementation of new e-banking technologies into the banking operation with the overall TRI score being 3.533 and 3.9, respectively. This findings is consistent with the study of Kaleem and Ahamd (2008); Mia, Rahman and Uddin (2007) and Nath, Schrick and Parzinger (2001), which reported that e-banking solution is being perceived as tool of enhancing customer service, operational efficiency and competitiveness among the bankers. Furthermore, the findings show that akin to their private sector bank peers, public sector bank employees are also having positive feeling about the technology with relatively higher mean scores against positive construct of techno-readiness i.e. optimism and innovativeness and relatively low mean scores against inhibitors of technology i.e. discomfort and insecurity. This result lends supports to the study of Kumar and Kumar (2004) that public sector bank employees' attitude is positive towards the e-banking technologies. In this context, it is noteworthy to know that public sector bank employees strongly protested atomization of banking operations at introductory stage of computerization, but soon they were convinced by the banking authority by imparting them proper training to handle computers and via dictating them various benefits of computerization.

Technology Readiness Segments

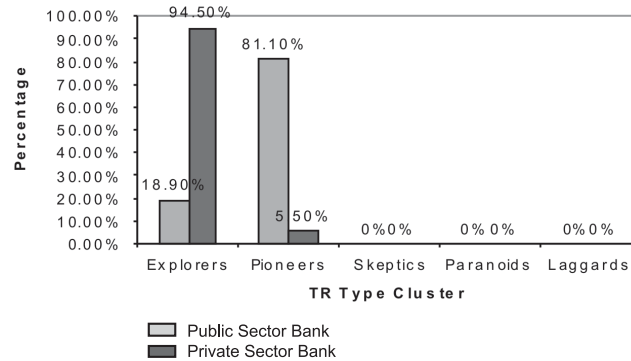
To further the understanding about techno-characteristics of the employees, the study makes a further attempt to classify the bank employees in both groups of banks into different TR segments i.e. Explorers, Pioneers, Skeptics, Paranoids and Laggards in the line of the guidelines of Parasuraman and Colby (2001) as mentioned in earlier section.

Table 6: TR Type Cluster and Type of Bank

TR Type Cluster	Public Sector Banks		Private Sector Banks	
	No. of Res.	Per.	No. of Res.	Per.
Explorers	9	18.9%	52	94.5%
Pioneers	39	81.1%	3	5.5%
Skeptics	0	0%	0	0%
Paranoids	0	0%	0	0%
Laggards	0	0%	0	0%
Total	48	100%	55	100%

Source: Primary Data

Figure 1: TR Type Cluster and Type of Bank



It is observed from the table 6 and figure 1 above, that majority of employees (94.5%) are explorers in case of private sector bank whereas majority of public sector employees (81.1%) are classified as Pioneers. This indicates that although public sector employees are no longer remain techno-resistant, the private sector employees are still ahead in terms of their receptiveness of technology. This may be due to the reason that private sector bank staff are highly educated than that of public sector.

Conclusion

Based on the results of TRI (Parasuraman, 2000) it can be concluded that public sector bank are no longer techno-resistant and they are also having positive approach to uptake the technologies at workplace in tandem with their private sector peers. However, private sector bank employees seem to be still ahead in terms of their receptiveness of technology in contrast to their public sector counterparts on the account of their staff being more techno-savvy and highly educated than that of public sector. This findings are quiet in the line with literature that people belong to elite community are more techno-savvy than normal community.

Managerial Implications and Recommendations

It is appeared from the results of TRI (Technology Readiness Index) that public sector bank employees are also having optimistic approach towards the technological upgradation in tandem with that of their private sector peers. Nevertheless, private sector bank employees are still ahead in terms of their receptiveness of technology in contrast to their public sector counterparts. Therefore, the study suggests that public sector banks should focus on continuous upgradation of their skill through re-skilling and re-training commensurate with changing need of environment to further close the gap with private sector banks. In addition, they ought to ensure an effective integration of HRM (Human Resource Management) strategies with ICT (Information and Communication Technologies) strategies.

Limitations and Directions for Future Research

Like any other research project, the present study also has certain limitations. First, accuracy of primary data depends upon the authenticity of the information provided by the respondents. Second, since the study is based on the samples selected from non-random method in urban India, the results should be interpreted with caution, with respect to the generalization of research findings to Indian banks' personnel as whole. Third, the present study is limited to only Indian scheduled commercial banks.

Future research needs to employ random sampling method to verify the findings of the current study. This study could be extended to foreign banks. Future study can made a comparison among public sector, private sector and foreign banks in terms of their employees' state of technology readiness. Furthermore, future studies can attempt to identify key antecedents of technology readiness. In addition, research issues addressed in this study can be explored in context of other developing and developed economics. This may provide comprehensive understanding of TR-related pattern across different cultures.

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