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Introduction

In today’s era when Information Technology (IT) has become a key resource for organizations to enable them to compete in the marketplace and address fast changing customer expectations, it becomes important to address the gaps in research that still remain in the area of IT adoption particularly in the Indian context. This research aims to reduce the gap in and contribute to understand better the role that internal organizational factors play to either deter or aid the IT adoption process in the organizations.

It is in the last two decades that IT started making an impact on work practices in organizations. In many cases, its impact extended to influencing the organization structure and organization design itself. With the growth and success of computer based information systems, even the economies entered a transformation phase (Sharif et al., 2004).

IT is purported to provide impetus to the organization’s ability to change and to respond fast for immediate and direct economic benefit. It also streamlines the administrative processes and facilitates the decentralization of the scope and scale of the business (Farbey et al., 1994).

On one hand heavy investments were made in acquiring new information systems by organizations with the objective of gaining competitive advantage (Caldeira and Ward, 2002) while on the other hand numerous examples of IT
implementation failures started circulating (Dryden, 1998). The possible causes included the lack of knowledge about how social factors and internal organizational variables were influencing the IT adoption processes. The biggest challenge identified in achieving successful IT implementation appears to be not technical in nature but human. The issues in IT implementation generally have pertained to lack of user awareness, project management, and industry or organization culture (Russell and Hoag, 2003).

It was these challenges and the anticipated perceived impact of IT on organizations’ competitive advantage that fuelled extensive research on IT adoption and its use in the organizations. The role that user acceptance of new innovations plays in the success or failure of IT implementations in organizations has been found to be a critical one. Thus understanding this intricate process and creating conditions for human organizations to adopt information systems successfully has become a high priority research issue (Venkatesh and Davis, 2000).

It has been suggested in literature that introducing IT without planning corresponding appropriate organizational changes generally leads to productivity losses rather than gains. The anticipated benefits due to the introduction of IT innovations in organizations do not materialize because of negative interactions of the IT systems with existing organizational practices (Milgrom and Roberts, 1992). Various research studies have effectively illustrated the inherent need to match the organizational structure with its technology capabilities in properly guiding a smooth transition to information technology intensive processes (Brynjolfsson et al., 1997).
Indian banking industry is in the midst of an IT revolution. The automation in banks is emerging as a key strategic component due to the combination of regulatory mechanism and increasing competitive intensity. It is posing an immense challenge to the bank managements as although investments in latest IT systems are being seen as a forgone conclusion but there are some concerns about the effective implementation of the IT systems as well as return on these huge investments. Literature reaffirms that the financial institutions in the 21st century would need to constantly leverage latest technology and continuously introduce innovative financial products and services (Gulati et al., 2002).

While Indian banks have accepted the key role that IT can and is playing in their organizations, it is crucial to keep in mind that it is not the sole reason of progress or change. The aspect of human elements basically personality issues and culture plays an equally important role in organizational operations including the effective and efficient deployment of IT (Chan, 2000). While the major contribution of IT in an organization is in enabling business processes and work practices and increasing productivity by reducing costs and increasing output quality (Bynjolfsson and Hitt, 2000), all these benefits can be diluted or even totally negated by user resistance to the introduction of new innovations in organizations thus leading to this aspect becoming one of the most studied currently.

**Problem Definition and Justification**

As it is becoming essential for Indian banking industry to consider IT as the strategic component that can help the banks to transform themselves, it is also becoming important for bank managements to understand how IT adoption
process will interact with internal organizational environment to facilitate this process. As studies have concluded that just making changes to existing IT systems or introducing new IT systems do not guarantee successful implementations, the organizations need to keep in view the relationships between the IT initiatives and their interaction with the existing organizational culture. Exploring and understanding this influence that the internal environment of an organization has on the success or failure of IT implementations is the key challenge for managements today (Harper and Utley, 2001).

This research examines the influence of organizational orientation particularly technology orientation of an organization on the IT adoption process in the Indian banking industry. The organizational orientations can either aid or deter the IT adoption process. Hence it is important to understand better the process of interaction of these orientations with the IT adoption process in an organization.

Despite the criticality of success of IT adoption process in Indian banks, little empirical research has addressed the role that organizational orientation plays in the whole process. Poku (2003) has referred to the gap that exists in determining the role an organization's internal operations play in information technology adoption in organizations.

This research specifically aims at understanding the relationship between organizations' success in adopting Information Technology systems in form of TBA or Total Branch Automation in Indian Banking industry and the level to which organizational orientation in form of technology orientation supports the IT initiatives. An organization can have more than one orientation at the same time.
but for the purpose of this study only the technology orientation has been investigated.

Specifically this study addresses the following questions. At what different stages of IT, various banks are at this juncture? Does technology orientation have an influence on the IT adoption factors chosen for this study viz., Extent of IT Application, Organizational Factors, Perceived Ease of Use by User, Perceived Usefulness by User, and External Factors, to enhance or reduce the Perceived Organizational Effectiveness of IT adoption.

Research on this aspect of the IT adoption process would not only provide bank managements and other stakeholders like Reserve Bank of India, Government of India, Bank Associations etc. with helpful information concerning the challenges that entrenched organizational orientation can create in the adoption process but also the possible intervention strategies that can be deployed to facilitate the whole process.

Research Objectives

To accomplish the research purpose, the following are the specific objectives that have been formulated:

1. To study the status of Information Technology in Indian Banks.

2. To examine the interaction of Technology Orientation and Perceived IT Adoption Effectiveness in organizations and develop a suitable model of this interaction process.
3. To evaluate how Technology Orientation affects the IT adoption process in organizations by studying Indian Banking Industry.

Research Hypotheses

The research hypotheses were formulated keeping in mind the specific relationships in the conceptual framework. In this study the IT adoption factors, as independent variables, considered are Extent of IT application (X1), Organizational Support (X2), Perceived Ease of Use by User (X3), Perceived Usefulness by User (X4), and External Factors (X5). Their relationship with perceived effectiveness of IT adoption, (Y) the dependent variable, in the Indian banking industry has been studied from the Technology Orientation (Mod), as a moderator variable, point of view of the user community particularly bank branch managers and their equivalent.

The research hypotheses are as follows:

Hypothesis 1: Technology orientation will influence the relationship between ‘extent of IT application’ (X1) and ‘perceived organization effectiveness of IT adoption (Y), such that the relationship between ‘extent of IT application’ (X1) and ‘perceived organization effectiveness of IT adoption’ (Y) will be positively pronounced for high technology orientation of an organization.

Hypothesis 2: Technology orientation will influence the relationship between ‘organization support’ (X2) and ‘perceived organization effectiveness of IT adoption’ (Y) such that the relationship between ‘organization support’ (X2) and ‘perceived organization effectiveness of IT adoption’ (Y) will be positively pronounced for high technology orientation of an organization.
Hypothesis 3: Technology orientation will influence the relationship between 'perceived ease of use' (X3) and 'perceived organization effectiveness of IT adoption' (Y) such that the relationship between 'perceived ease of use' (X3) and 'perceived organization effectiveness of IT adoption' (Y) will be positively pronounced for high technology orientation of an organization.

Hypothesis 4: Technology orientation will influence the relationship between 'perceived usefulness' (X4) and 'perceived organization effectiveness of IT adoption' (Y) such that the relationship between 'perceived usefulness' (X4) and 'perceived organization effectiveness of IT adoption' (Y) will be positively pronounced for high technology orientation of an organization.

Hypothesis- 5: Technology orientation will influence the relationship between 'external factors' (X5) and 'perceived organization effectiveness of IT adoption' (Y) such that the relationship between 'external factors' (X5) and 'perceived organization effectiveness of IT adoption' (Y) will be positively pronounced for high technology orientation of an organization.

Research Methodology

As IT is an all encompassing term that includes hardware, software, communication, man and materials required to implement, for this study specifically Bank Branch Automation in form of Total Branch Automation (TBA) has been chosen as an example of IT application.

A structured questionnaire was developed to collect data on the variables of this study with TBA as the technology on which the conceptual model would be tested. Based on the literature, some questions were adopted and compiled from
previous studies of IT adoption and others were developed or modified specifically for this study. The measures used for testing the constructs were developed by the researcher as well as adopted from other sources that had been used in previous studies (Poku, 2003; Kamal, 2006; Sohal, 2000; Lee et al., 2005; Power, 2004; Lu et al., 2003, Kim and Galliers, 2004; Ndubisi and Jantan, 2003; Hsieh et al., 2006; Poon et al., 2005). The guidelines followed during the questionnaire design were based on the recommendations of Dillman (1978) and Churchill (1979). The type of questions ranged to include open ended, dichotomous, multiple categories closed ended and labelled scale response questions.

Pilot testing was conducted to validate the items and whole scale in the instrument. This was necessitated because some of the measurement items were modified or developed specifically for this research leading to compilation of some new questions.

A preliminary questionnaire was developed by amalgamating item pools from previous studies and distributed to five bank managers and five professors (two from Aligarh Muslim University, one eminent retired professor from Delhi University and two professors from Lingaya’s Institute of Management & Technology) to gain their feedback on the content, layout, wording and ease of comprehension of measurement items. Their feedback for improvements on clarity, readability, content enhancement and layout were incorporated in the second stage of the instrument development.
A set of twenty bank branches was interviewed using the revised questionnaire. Verbal feedback was received and changes made accordingly. The pilot test results indicated a requirement of simplification of some words to cater to varied level of English language comprehension in India. The words flexibility and responsiveness were explained again with more clarity.

The target population for this research was bank branch managers or equivalent, like divisional managers etc. of scheduled commercial banks. The total population of the bank branches of interest for the present study turned out to be 54618 spread all over India. The banks that were not taken into account were scheduled cooperative banks, regional rural banks and other non-scheduled banks. The reason for such exclusion is on the basis of issues in governance under strict rules/supervision; and pertinent data inaccessibility.

This study has heavily relied upon the published data of RBI and web-links of Indian Banks Association and sample banks and their offices. In the multi-stage sampling design, in the first stage a list of bank names in the categories viz., Nationalized Public Sector bank, SBI, SBI Subsidiary, Old Private Sector bank, New Private Sector bank and Foreign banks was listed. In the second stage, a list of 4 banks each was selected on the purposive random sampling basis. At this stage the number of bank branches of these short listed banks turned out to be 27135. This constituted nearly 49.7 per cent of the total branches of the selected universe of scheduled commercial banks excluding regional rural banks. The bank branches list was then compiled from the websites and also by contacting the banks’ offices. Further sampling was done using software called 'The Survey
Systems’ version 9.5. From this database of 27135 branches, 1200 branches were sampled out at 80 per cent confidence interval.

The structured questionnaire was sent to 1200 branches through couriers and also through offices of IT division, DCM Ltd. as well as Sysnet Ltd., wherever their service locations matched with the locations in sample.

For some IT adoption factors, a modified version of a similar instrument which was developed by Computer Science and Telecommunications Board of National Research Council in 1991 and used by Poku (2003) was suitably adapted for IT adoption. Other items were adapted from the TAM by (Davis 1989; ~ et al. 1989). The organizational support and external factors adoption factors were adapted from Kamal’s (2006) model for IT innovation adoption in the Government sector.

An alpha of 0.50 or above is considered by Bowling (1997) as an indication of good internal consistency, whereas an alpha of 0.70 or above is considered satisfactory by Howitt and Cramer (2003). In this research, the multi item scales were checked for reliability by calculating Cronbach’s alpha, where the benchmark value of 0.50 or greater was considered acceptable.

The study has used seven tools to measure following variables and their Cronbach’s alpha is as given: Perceived effectiveness of IT adoption (.686), Organization Support (.830), Perceived Ease of Use (.739), Perceived Usefulness (.567), External Factors (.791), Technology Orientation (.512) and Extent of IT Application (.585).
For validity apart from the expert's opinion during the pilot testing, the statistics were computed for ANOVA with Friedman's test and Tukey's test, which explained that the tools employed in the study between observations and between items are significant at 95 per cent confidence interval.

The collected information/data using questionnaire was keyed into MS Excel. Further it was exported to SPSS (Statistical Package for Social Sciences) software, version 12 for Windows with compatible environment of data coding. Using SPSS analyse menu option, factor analysis, regression and multivariate statistical tools/techniques were deployed to analyse the quantitative aspect of the data. For qualitative data, univariate inferential summary statistics were used and the differences and similarities of ordinal and interval were used to measure various constructs. Graphical representations of the data such as charts, tables and other figures were depicted wherever applicable. Descriptive analyses were used to emphasize the qualitative side of the research.

**Analysis and Results**

To derive the relevant items for each variable, (repressors and regressand) in the present study, a composite value was worked out using lateral averaging method for each scale whereas a principal component analysis with communalities in the primary diagonal and a varimax rotation was also conducted. During factor loadings, an iterative procedure led to a reduction of unwarranted items under each factor.

For all the hypotheses, two tailed t-test results were not found significant at 0.05 level where t-value lies outside the range of -1.96 and +1.96. Hence, it has been
concluded that interaction of X1, X2, X3, X4 and X5 (independent variables) and moderator variable Mod (β in (γ) = -0.03, -0.005, -0.007, -0.011, -0.007 respectively, p>0.05) is supporting technology orientation as a moderator of the relationship between and X1, X2, X3, X4, X5 and Y.

The decision rules for acceptance/rejection of Null Hypothesis (H₀) state that the calculated absolute value of a test statistic is more than or equal to its critical (or table) value. Hence, we reject the Null Hypothesis (H₀) and the Alternative Hypothesis (H₁) is accepted as the p value cited in the results corresponding to the Moderator Variable (Mod) in Model 1 is 0.598 (X1), 0.935 (X2), 0.893 (X3), 0.846 (X4) and 0.902 (X5) respectively. The analyses indicate that the technology orientation influences the relationship between X1, X2, X3, X4, X5 respectively and Y such that the relationship between X1, X2, X3, X4, X5 and Y is positively pronounced for high technology orientation of an organization.

**Conclusions and Recommendations**

Results from the study indicate that majority of respondents in the Indian banking industry have either already adopted or are in the process of adopting IT in form of TBA or even more sophisticated software and in the process not only attempting to deliver better service to the customer but even bring efficiency in its internal operations. In the study the majority of respondents confirmed that IT is enabling better customer response, instituting productivity enhancements and even improving the coordination among various departments. The study has also shown the depth to which IT has percolated in all the processes of the Indian banking
industry with 97.5 percent of respondents agreeing with the statement that their organizations are using technology to create value.

As explained in demographics, 54.7 percent of respondents had gone even beyond TBA. The major IT adoption exercise in Indian banking industry happened between years 2000 to 2006. This could be seen in light of the urgent need of Indian banks to survive and adapt to the changing environment. The banking firms started focusing on understanding the drivers of success, like better utilization of its resources (viz., technology, infrastructure and employees), process of delivering quality service to its customers and performance benchmarking. The efficiency of banks became the critical basis to offer an effective competition (Mukherjee et al., 2002).

At this juncture the challenges being faced by the Indian banking industry are in the form of, deregulation leading to increasing competitive intensity requiring flexibility of operations, customers demanding more innovative product offerings and competency gap on the human resource front. With more than 50 per cent of respondents confirming the status of IT in their organization as core banking or beyond, it is not surprising that a study has indicated that public sector banks have become more efficient than private and foreign banks. The public banks are catering to a large number of customers spread across the country whereas foreign banks are focusing on niche markets and thus not able to reap the full benefits of the high technology (Mukherjee et al., 2002)

This study confirms that IT has become quite pervasive in the Indian banking industry with majority of respondents confirming that IT has started contributing
in decision making process and even improving it. Public sector banks that are moving fast on adopting new concepts in banking, turning tech savvy, becoming more efficient post VRS and getting more autonomous can succeed in effectively taking on the private sector banks by virtue of their sheer size. Foreign banks on the other hand are likely to achieve success in their chosen niche segments and remain the leaders in innovation and technology introduction. The introduction of technology has brought a major change in delivery of services and raised the customer expectations to get fast, efficient and personalized service (Kuppuswamy, 2003).

Kamath et al. (2003) has defined winners in this sector as those players who will have a better understanding of the customer, fulfill their needs better, leverage technology, knowledge, and human resources to make available quality products and services, thus delivering value to all stakeholders. And towards these objectives the role of information technology has been reaffirmed by this research to be of critical nature. As one of the key factor for the success remains improving the competency levels of their human resources and although banks have formal systems, procedures and departments, there is a need to improve the quality of training initiative much beyond the current levels as the study has shown that although majority are satisfied with the quantum of training but less than 50 per cent are satisfied with the quality levels of training programs. This will require intervention by top management as their role has been identified as an enabler in the successful adoption of IT in the Indian banking industry.

As predicted the moderator variable “technology orientation” significantly influenced the relationship between “extent of IT application” and “perceived
organization effectiveness of IT adoption”. This indicated that the increasing efficiency needs of the banks require successful IT adoption to improve operational efficiency as well as provide better portfolio of products and services in a more personalized manner. A high technology orientation of an organization makes IT pervasive in all organization activities and deepens IT’s impact on organization processes. As borne out by study, it improves the decision making process, enables faster customer response, leads to productivity enhancements, improves coordination amongst different departments and meets employees’ and management expectations.

The relationship between “organization support” and “perceived organization effectiveness of IT adoption” was also significantly influenced by high technology orientation. Organizations with high technology orientation have a more effective internal technical support as well as extensive top management support. High technology orientation also has better IT knowledge and IT expertise ingrained across various levels of the organization. In such organizations employees tend to participate in contributing to IT decisions and the level of cooperation amongst coworkers is generally high.

The new technologies are bound to provide more “perceived ease of use” to the users leading to better assimilation of the new technologies and thus further strengthening the ease of use feeling making it a positive virtuous cycle. This process is strengthened by a high technology orientation of an organization as has been shown in the study. It also makes employees’ jobs easier to perform. The employees not only enjoy deploying IT in their activities but they even explore and find new ways of doing their jobs.
Similarly the interaction, of “perceived usefulness” and the “perceived organization effectiveness of IT adoption” was seen to be significantly influenced by technology orientation. The study reinforced that high technology orientation impacts more positively on increasing productivity and leads to a greater work control.

External environmental factors’ interaction with perceived organizational effectiveness of IT adoption was also significantly influenced by technology orientation. The technology orientation enables organizations to respond faster to the introduction of new innovations by the various stakeholders in the environment like government entities, trade associations, competitors and also the mandatory compliances by central banks and world level agreements. The high technology orientation not only helps in a better response but it also makes the adoption process faster and more effective.

Limitations and Directions for Future Research

The suggestions for further research have been proposed based on the results and the limitations of the study.

This study not only has provided a view about the IT adoption process and IT adoption effectiveness in Indian banking industry but also offers an opportunity to the top management to further fine tune the IT adoption process and thus get more value out of their huge investments. Before launching any organization wide IT initiative, better planning can be done with the help of this study by incorporating the parameters listed and measured in the planning process itself.
The sample for this study consisted of the respondents who were at managerial grade in bank branches and whose responses provided their perspective of the IT adoption process in their banks. Hence, the results cannot be generalized to all the employee segments of the banks. Future research should also attempt to include lower levels of hierarchy within bank branches to get their perceptions and views about the IT adoption process in banks. This study was focused on technology orientation only and did not attempt any comparative impact analysis of different orientations. This opens up another area of research for future where more than one orientation can be studied and their impact analysed on the IT adoption process in organizations.

In this research the sample consisted only of scheduled commercial banks sans regional rural banks, cooperative banks and other non scheduled commercial banks. In future when better quality data is available for such banks, they also can be included in the study. There were limitations in the study as it did not investigate differences between measured variables with respect to respondent’s demographic characteristics. There may be variations in the subjects with different demographic characteristics leading to differences in responses and behaviour which itself could be subject of a research study.

The study brought out the different stages of IT that banks are at currently. This provides an opportunity to investigate the different experiences of the banks with different IT solutions and conduct a comparative analysis of their impact on the effectiveness of IT adoption in the organizations.
Training was found to be an area that requires more focus and intervention by the management particularly on quality aspect. It throws up an opportunity for the researchers to evaluate other non formal methods that can contribute to training process amongst the employees.

The Indian banking industry was forced to drastically change its technology strategies after the opening up of the Indian economy and the deregulation of the sector, a comparative study between before and after would provide interesting information about the differences in the two as well as knowledge about the migration process and how to mitigate the pains associated with it. On the orientation aspect, future research is also warranted on how the other orientations may influence the IT adoption process in the organizations.