Review of Literature

2.1 Introduction

This chapter covers the literature review of the foundation concepts and subjects required to build the model for the intended study. The concepts and subjects covered are related to organizational orientation, information technology, information technology adoption and Indian banking industry concluding with the implications for this study.

The literature review for the dependent variable, independent variables and moderator variable specifically appears in chapter three under model constructs description and development (3.4).

2.2 Overview of Organizational Orientation

Organizational orientation or corporate orientation is generally an end result of deep-rooted cultural inclinations that an organization develops over time. There are extensive studies on corporate culture or organizational culture and the subject is continuously evolving as organizations face new developments like emergence of service economy, the ubiquity of technology that is pervading most of the aspects in an organization, the increasingly dynamic external environment, and increasing importance of flexibility in production systems against standardization etc.

While the influence of a large number of external factors viz., industry, product, technological environment on the conception and implementation of
organization's strategy is often considered in the literature, the role of an organization's internal resources in the process is mostly neglected.

2.2.1 Corporate Culture

Pioneering work on this subject in literature showed the influence that the values and philosophy have on employees' behaviour in guiding their organizations towards success and it has attracted lot of attention since then (Deal and Kennedy, 1982).

The definition of corporate culture has evolved over time and lots of researchers have added to it. It has been defined as a set of values, beliefs and behaviour patterns that form the core identity of organizations and that helps in guiding the employees' behaviour (Deal and Kennedy, 1982; Schein, 1992; Kotter and Heskett, 1992; Pheysey, 1993; Van der Post et al., 1998). It also has been referred as a pattern of beliefs, symbols, myths and practices that have evolved over time in an organization (Pheysey, 1993) and also the dominant values espoused by an organization that define "how we do things around here" (Deal and Kennedy, 1982; Quinn, 1988).

The various studies have suggested the importance of corporate culture in the field of organizational behaviour and explored its linkage in understanding the context of organizations as well as the people managing these organizations to achieve the organizations' goals and objectives.

Literature refers to the linkage that a positive corporate culture has in providing a leading competitive edge over competition (Sadri and Lees, 2001). Better performance appears to be a norm in organizations with participative cultures
(Denison, 1990). More financially effective organizations have been shown to be different from those that are not on organizational culture dimensions (Van der Post et al., 1998).

Researchers have categorized corporate cultures as this can help managers in many ways. Categorization provides a better understanding of the strengths and weaknesses of different cultures and thus it helps managers in deciding about and guiding the process of cultural change in an organization. Managers also get a better understanding of the effects that a particular culture may have on the organizational strategies that may be developed and deployed.

Sonnenfeld (1988) defines four types of cultures: the academy, the club, the baseball team and the fortress. The academy culture gives exposure to employees in varied jobs so that they are mobile within an organization. The club culture concerns itself with how to fit people in the organization. The baseball team culture relies on individual talents who are rewarded handsomely for achievements and are also mobile for better opportunities elsewhere. The fortress organization’s sole objective is survival.

There has been research on the relationship between corporate culture and market orientation in Indian and Japanese organizations (Deshpande and Farley, 1999). It identifies four types of corporate culture viz. competitive culture, entrepreneurial culture, bureaucratic culture and consensual culture. The competitive culture gives emphasis to, demanding goals, competitive advantage, market superiority and profits whereas the entrepreneurial culture values innovation, risk taking,
dynamism and creativity. Bureaucratic culture is characterized by formalization, rules, standard operating procedures and hierarchical coordination resulting in predictability, efficiency and stability. It is the elements of tradition, loyalty, personal commitment, socialization, teamwork, self-management and social influence that are important as the organizational values in a consensual culture.

Another categorization has been suggested by postulating that corporate culture is a function of levels of sociability and solidarity. Sociability is defined as a factor depicting sincere friendliness among members of a community whereas solidarity describes a community's ability to pursue shared objectives quickly and effectively. The combination of these dimensions is categorized as networked, mercenary, fragmented and communal (Goffee and Jones, 1996).

No category is better than others; instead they serve as a way for management to determine where their culture fits relative to other types of cultures. It has been suggested in literature that there are a core set of ideological guidelines within an organization that requires a minimal consensus and consistency otherwise organizations would not function. Hence in midst of all inconsistencies, ambiguities, conflicts, disruption and dissolution in an organization there will still be consistency, consensus, harmony and integration on some aspects (Schein, 1999).

Earlier literature on corporate culture concerned itself with the culture pertaining to production teams and focused in particular the study and transfer of Japanese shop-floor culture to western industry. With the increase of services content and research work on service quality over time the researchers' interest in the role of
corporate culture in delivery of service quality increased (Parsuraman et al., 1985; Zeithaml et al., 1988; Gronroos, 1988 and Gummesson, 1988). Various studies have proposed different conceptual models placing corporate culture at the centre of the service delivery process and its impact on the effectiveness of an organization's service delivery capabilities.

The services industry is uniquely characterized by generally intangible offerings which mostly are heterogeneous, production, distribution and consumption may happen simultaneously, customers participate in the production process and transfer of ownership may not materialize. Thus the basic characteristics of services generally remain same where there is an interaction between the customer and some or all parts of the production process of the service provider be it personnel, technology or both and some input is always required from the customer (Shanker 2002).

Corporate culture is believed to be important in determining success or failure of organizations in the coming decades and the financial performance is postulated to have a significant influence on an organization's long-term economic performance (Kotter and Heskett, 1992). Research on strategy has identified the importance of the role that an appropriate and consistent, culturally defined orientation plays in effective business development. The functional orientation was found to be a significant factor in UK textile industry for innovation and achieving strategic success (Pearson, 1993).

It has been summarized in the literature that in the first fifty years of the twentieth century, the successful organizations were focused on optimising their
performance of one of the function, production, R&D or marketing. Since 1950s, the business environment started becoming complex and dynamic and success started depending on a combination of many functional influences. Until the mid 1980s, the high tech industries remained focused on technology and later the focus started shifting to the multifunctional orientation. A major aspect of this became the general management’s control over the rate of technology proliferation (Ansoff, 1987).

In the earlier literature, the concept of business orientation referred to four orientations viz., production, product, sales, and marketing. Production orientation summarizes that if a product can be made cheaply enough, it will be bought. Product orientation assumes that if product is of sufficient quality, people will buy it. Sales orientation in contrast takes the product as a given and assumes that if one sells hard enough, people will buy anything. Finally marketing orientation holds that a business must first identify customer needs and then produce a product satisfying those needs.

Gatignon and Xuereb (1997) used the term “Strategic Orientation” to refer to three distinct orientations: customer, competitor, and technology (or product). Pearson (1993) reviewed the orthodox treatment of production, product, sales and marketing business orientations in marketing texts and suggested changes. He identified orientation as one of the most important factor for business success and valued its profound effect on effectiveness of business strategy. He recommended that the orthodox orientations should be revised to marketing/customer orientation, accounting/cost orientation, production/technology orientation and
R&D/innovation orientation. These are not mutually exclusive but rather organizations generally are and also need to be oriented to all four to some extent.

The literature affirms that an intended strategic direction that is not supported by an appropriate business orientation is unlikely to succeed (Pearson 1993). It has been theorized that organizations should be 'need oriented' while choosing a strategic philosophy. After having analysed all the elements that are required for success of an organization, it should be decided which orientation is most suitable. This process would require an assessment of the organization’s strengths and weaknesses and identification of its competencies. This analysis will then be used for targeting the organization’s strategic and new product efforts. An organization may find that a strong marketing orientation is required or it may find that alternately a technology or production orientation is more suitable and effective route to follow (Bennett and Cooper, 1979).

2.2.2 Technology and its Role in Organizations

Technology has been broadly defined as know-how. Classification of technology has been done on the basis of the set of ideas that are embedded in a product, or the set of ideas in the manufacturing process of a product or the steps required to amalgamate new materials to produce a product. Generally organizations focus on product related technology as the driving force of a company’s competitiveness whereas it alone may not provide the organization a long-term competitive edge unless it is matched with appropriate manufacturing capabilities. Product innovation and manufacturing activities nowadays go hand in hand such that
continual improvement in production processes can enable a company to maintain product innovation based competitiveness (Kotabe, 1998).

The technological changes of 21st century are creating immense strategic challenges for organizations. These changes on one hand are making traditional competitive advantages meaningless whereas they are also giving rise to new opportunities for technologically savvy organizations.

Utilization of technology across all business functions is the way to create customer value for any organization. This value creation, which is critical for organizations to survive, encompasses all the functions of an organization from R&D to manufacturing to marketing.

Nowadays what has become important for organizations is how much it focuses on and invests in innovation and technology rather how much it spends on R&D alone. During the early 1990s itself most organizations moved beyond isolated R&D management to the next generation wherein R&D was integrated across the entire business enterprise and became a major part of the organization's strategy and culture (Jonash & Sommerlatte, 1999).

2.2.3 Technology Orientation Definition

There is a wide spectrum of orientations that organizations could have or adopt as a dominant orientation viz., marketing orientation, R&D orientation, technology orientation etc.

However, for the purpose of this study, organizational orientation investigated and analysed conceptually is the technology orientation.
The updated definition of technology orientation on the basis of the synthesis and discussion on corporate culture, organizational orientation, and technology and service industry necessitates incorporating the developments traced in the above-mentioned literature.

Technology Orientation can be defined as an extent:

- To which processes in the organization use technology to produce and deliver the product/service at lowest cost, high efficiency that are aimed for wide distribution.
- To which the new technologies become part of the daily business practices.
- To which technology allows for flexibility in production.
- To which technology allows for quality in production and integrates various control systems.

2.3 Overview of Information Technology (IT)

2.3.1 Introduction

According to NDCC 54.59.01 guideline of North Dakota Information Technology Department, Information technology means the use of hardware, software, services and supporting infrastructure to manage and deliver information using voice, data and video.

Continuing to further define Information Technology it states it to include:

- All computers with a human interface
• All computer peripherals which will not operate unless connected to a computer or network

• All voice, video and data networks and the equipment, staff and purchased services necessary to operate them

• All salary and benefits for staff whose job descriptions specifically includes technology functions, i.e. network services, applications development, systems administration

• All technology services provided by vendors or contractors

• All costs directly associated with developing, purchasing, licensing or maintaining software

Wikipedia, the free encyclopaedia on net, defines information technology as the technology required for information processing. In particular the use of electronic computers and computer software to convert, store, protect, process, transmit and retrieve information from anywhere, anytime.

An alternative definition that is based on the definition by Martin et al. (1999) and which has been used in various research studies (Ryssel et al., 2004) is cited infra:

Information Technology is a term that encompasses all forms of technology utilized to create, capture, manipulate, communicate, exchange, present and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived.

Information technology is in a virtuous cycle; the costs of hardware, communications, and software are continuously falling. The utility in almost all areas of business is increasing. The result is that information technology is
becoming pervasive in areas as diverse as manufacturing, retail, services, finance, HR, education and sales and marketing. Everywhere the technology is not only providing greater operational efficiency but also impacting the way business is done and organizations are structured and designed (Aral et al., 2006).

In the developing countries the information technology has found major use in services arena. It has been noticed that in the early phases of a country’s computerization generally Government is the biggest adopter of the applications followed by banking sector. A world bank policy research bulletin has summarized that several requirements should be fulfilled for the effective use of information technology and these are; knowledge must flow worldwide with the greatest possible freedom, the incentives to adopt new technologies must be in place, the national infrastructure to support the adoption of those technologies must exist and the organizations must have the capacity and structure to absorb the technology (Mody and Dahlman, 1992).

Initially IT was perceived as a business efficiency enhancement tool but now it has become one of the most critical components of the overall business strategy. Its role includes creating new needs, enabling efficient new product development and generating new work procedures.

In an organization IT can be internally oriented or outwardly oriented. Information systems that are not in interaction with external organizations comprise of internal IT. These typically include domains of office and factory automation systems that organize work in an efficient manner (Stump and Sriram, 1997). It is the advent of Internet, WANs etc. that has created the technological basis for connecting an
organization’s internal information systems with outside networks. This shared IT is generally used between suppliers and customers and sometimes also interacts with competitors, research organizations, industry associations etc. Some of the applications that are covered in internal IT are office automation, Transaction processing, Enterprise Resource Planning, Data Warehousing, Groupware, Intranets and executive information whereas common applications in Shared IT are inter-organizational systems, Electronic Data Interchange and Extranets (Ryssel et al., 2004).

The influence of information technology in the growth of relationships between suppliers and customers has evoked a considerable interest and has been a focus of extensive research due to its potential to enhance the benefits of these relationships. Internet based systems enhance the opportunity for organizations to support their customer’s complex requirements of mobility and remote access to information and services on 24x7 environment. The electronic medium thus adopts a role of an extension of the existing product or brand (Mulligan and Gordon, 2002).

Chan (2000) has proposed a framework of the roles of IT as an initiator, a facilitator or an enabler. Under this framework IT can adopt any of the three roles subject to the business environment and the way technology is being applied. In the initiator role IT acts as a change agent where a causal relation may be involved, new requirements generated which need to address by the using existing IT systems. IT as a facilitator serves to make some work or workload easier generating a need to design new product offerings to fulfil those requirements or seeks to create new operations to accomplish new functions. Whenever IT acts to
generate a process innovation to provide the ability to accomplish some objective
it acts an enabler.

Chan (2000) has summarized some of the reported impacts of IT on process
innovation on the basis of works of Davenport and Short, 1990 and Davenport,
1993.

<table>
<thead>
<tr>
<th>Capability</th>
<th>Impact and Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automational</td>
<td>IT can replace or reduce human labor in a process</td>
</tr>
<tr>
<td>Analytical</td>
<td>IT can improve analysis of information and decision-making</td>
</tr>
<tr>
<td>Disintermediation</td>
<td>IT can be used to connect two parties within a process and eliminate intermediaries from a process</td>
</tr>
<tr>
<td>Geographical</td>
<td>IT can transfer and coordinate information with rapidity and ease across large distances, making processes independent of geography</td>
</tr>
<tr>
<td>Informational</td>
<td>IT can capture vast amounts of detailed process information for purpose of understanding</td>
</tr>
<tr>
<td>Integrative</td>
<td>IT can coordinate tasks and processes</td>
</tr>
<tr>
<td>Intellectual</td>
<td>IT can capture and distribute intellectual assets</td>
</tr>
<tr>
<td>KM</td>
<td>IT allows the capture and dissemination of knowledge and expertise to improve the process</td>
</tr>
</tbody>
</table>
Sequential IT can enable changes in the sequence of tasks in a process, often allowing parallelism

Tracking IT allows the detailed monitoring of process status, inputs and outputs

Transactional IT can transform unstructured processes into routinized transaction

There is another theoretical framework that explains the important factor called IT and its evolution in the organizations. It offers in-depth insights in the ways which IT has evolved and also offers the senior managers and IT professionals the possibility of giving direction and managing IT to their advantage (Nolan, 1973).

The evolution stages in the Nolan stages theory are DP stage, IT stage and Network stage in the organizational learning. In the DP stage the IT is used as internal efficiency tools and thus could be planned and implemented independent of business strategy. It was used generally in support departments e.g. finance, personnel or marketing. In the IT stage, IT starts needing involvement and participation of senior management as it enables process oriented designs and becomes a key resource to provide improved service levels to customers and becomes channel to establish useful electronic links with other stakeholders.

It is in the network stage that it becomes important to first define a vision, and then involve IT as strategic component and interweave it in all aspects of the business be it products, services, distribution and delivery processes (Mutsaers et al., 1998).
2.3.2 Information Technology & Banking Industry

Moskow (1997), President of the Federal Reserve Bank of Chicago made the following telling remarks in a conference:

Technology is fundamentally altering the industry – it's affecting what products and services are provided, where they are provided, how they are provided and who they are provided to. There's urgency about technology that we haven't seen before...
Technology is blurring the old lines that define products and services, customers and markets...It has far reaching implications for all aspects of the banking business....
How bankers respond to these issues will help shape the future of the industry.

Technology in banking is known to reduce transaction costs, allow cross marketing products to customers and allow innovation in developing new products. It speeds up the financial reporting process and makes public disclosures in form of regulatory reports an easier and timely job. Hence technology can be the key to differentiation, competitive edge and institutional survival (Rishi and Saxena, 2004).

Information technology has played two prominent roles in banking. One is communication and connectivity and other is business process reengineering. It has allowed sophisticated product development, provided better market infrastructure, implemented reliable techniques for control of risks and has helped the financial intermediaries to reach geographically distant and diversified markets.

In view of this, technology has changed the contours of three major functions performed by banks, i.e. access to liquidity, transformation of assets and monitoring of risks. Further IT and the communication networking systems have a
crucial bearing on the efficiency of money, capital and foreign exchange markets (Khanna, 2002).

2.4 Overview of Information Technology Adoption

2.4.1 Theoretical Models of IT Adoption

IT adoption in organizations, as a subject, has been studied and analysed from various points of view and theoretical perspectives, such as transaction cost economics, population ecology and resource dependence theory (Iskander et al., 2001).

However, there is still a shortage of research studies that have analyzed the factors that influence IT adoption process by organizations, particularly the factors that characterize the internal environment of the organizations.

Mandatory compliance based approaches for IT introduction and implementation in organizations have not been found to be effective. It is the social influence, which appears to be more effective in bringing about positive changes in perceived usefulness.

It is developing mandates that enhance credibility of sources of social information or implementing communication packages to increase the prestige of system use have been found to have a positive impact in increasing acceptance of new technology. These efforts may also exhibit the comparative effectiveness of a new system compared to the status quo in enhancing the user acceptance (Davis and Kottemann, 1995).
Research efforts on IT adoption and diffusion have generally converged around on a core set of theoretical models that seek to explain target adopter attitudes and their innovation related behaviour (Gallivan, 2001). The diverse information technology adoption models are summarized and presented in the Table 2 (Kamal, 2006).

The diffusion research in social sciences till 1960s had concentrated on individuals as adopters of innovation and it was their behaviour that had been the research target. The studies attempted to explain the observed patterns of diffusion in terms of rational decision making by potential adopters (longitudinal). What were generally not focused on were the variables that influenced the adoption decision by organizations (cross-sectional). It was only later that the focus of research started including the organizational characteristics as an important framework that influenced adoption of innovations in organizations.

In any organization the innovation adoption is purported to follow three stages viz., cognitive, affective and lastly behavioural. In the first stage i.e. cognitive stage, managers of an organization either mull over a new technology or they get exposed to it due to various factors. In the next stage, the organization enters the affective stage where the managers' feelings toward the new innovation take shape and become important. If the feelings are favourable, the organization moves to the last behavioural stage where it adopts the new technology (Williams and Rao, 1998). The various classical models explaining this process include AIDA model: Attention, Interest, Desire and Action, Hierarchy of Effects model, Innovation adoption model; and Kotler's (1984) Communications model.
In the AIDA model, first the innovation comes to the attention of the organization, which evokes the organization’s interest in it. This interest leads to a desire for obtaining the benefits of the new innovation and finally the new technology is adopted by the organization.

Hierarchy of Effects model follows similar but more detailed steps. The first step starts with organization becoming aware of the new technology, which pushes the organization to research and evaluate it for benefits. This generates some views and feelings about the new technology. The positive feeling about the technology evokes a conviction, which ultimately leads to technology adoption.

In the communications model, an organization becomes aware of the new technology and gets exposed and receives the new technology with a cognitive response. An attitude about the new technology gets developed which culminates into an organization’s intention to act thus leading to the final adoption.

Innovation Adoption model too follows the similar steps. It was Rogers (1962) who proposed the Innovation Adoption model that suggested five product or service characteristics, which were postulated to influence consumer acceptance of new products and services. These were Relative Advantage, Compatibility, Simplicity/Complexity, Observability and Trialability. This model has been incorporated by various researchers in their empirical work that have examined technological innovations (Rogers, 1962; Raju, 1980; Shimp and Beardon, 1982; Price and Ridgeway, 1983; Childers, 1986; Prendergast, 1993; Dabholkar, 1996; Lockett and Littler, 1997; Daniel, 1999; Howcroft et al., 2002; Lee et al., 2003).
Relative advantage refers to the degree to which users/consumers perceive a new product or service different from and better than its substitutes. It may be a time saving mechanism for users or money-saving in operation or just being more expedient compared to its substitutes. In case users need to provide large amounts of personal information, it may affect the adoption process negatively. In the banking context easier reconciliation of bank accounts and automatic ledger generation using total branch automation may affect adoption of Total Branch Automation positively.

Compatibility is the extent to which a new product or service is consistent and compatible with consumers' needs, beliefs, values, experiences and habits. In case of banking services or technologies, it could be the degree to which the innovation fits in with the banking behaviour of a consumer and the way in which consumers have historically dealt with the banks. The innovations like electronic pass book printing, or mail alerts etc. may have better acceptance as the consumer has to do no extra effort. Same technology having teething problems like consistent breakdown of printers or computers would be considered in a negative manner and may influence innovation adoption negatively. If the bank employees have to totally relearn their way of working then adoption of innovation may be affected adversely.

Simplicity / Complexity refers to the degree to which a new innovation is perceived by the users/consumers as easy to understand or use. Consumers not having previous computer experience may not appreciate all the advantages that IT in banking may have to offer and the adoption of innovations thus may be thwarted.
**Table 1. Diverse IT Adoption Models & Processes (Kamal, 2006)**

<table>
<thead>
<tr>
<th>References</th>
<th>Stages / Phases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Model (Lewin, 1952)</td>
<td>Unfreezing</td>
</tr>
<tr>
<td>Organisational Innovation Model (Pierce and Delbecq, 1977)</td>
<td>Initiation</td>
</tr>
<tr>
<td>Four Phase Innovation Adoption Process (Darmawan, 2001)</td>
<td>Initiation</td>
</tr>
<tr>
<td>Stages of Innovation Adoption (Becker and Whisler, 1967)</td>
<td>Stimulus</td>
</tr>
<tr>
<td>The Research Model (Agarwal and Prasad, 1998)</td>
<td>Awareness</td>
</tr>
<tr>
<td>Organisation Innovation Adoption (Frambach and Schillewaert, 2002)</td>
<td>Awareness</td>
</tr>
<tr>
<td>Innovation Adoption and Implementation (Gellivan, 2001)</td>
<td>Primary Authority Adoption Decision</td>
</tr>
<tr>
<td>Innovation Adoption (Rogers, 1995)</td>
<td>Knowledge of Innovation</td>
</tr>
<tr>
<td>IT Adoption Model (Dixon, 1999)</td>
<td>Analyzing Requirements &amp; Assessing Capabilities</td>
</tr>
<tr>
<td>Technology Acceptance Model (Davis, 1989)</td>
<td>Investigating the external variables</td>
</tr>
<tr>
<td>Two Stage Innovation Adoption Model (Zaltman et al, 1973)</td>
<td>Primary Adoption</td>
</tr>
<tr>
<td></td>
<td>A Firm Level Decision for Technology Acceptance</td>
</tr>
</tbody>
</table>

27
Observability is the extent to which an innovation is visible and communicable to users. While automating any bank branch, the simple installation of a PC at a desk is more observable.

Trialability is the ability of users to experiment with a new innovation and evaluate its benefits. The extent to which various bank employees are exposed to the hardware and software for deploying IT impacts the IT adoption process of the innovation.

Roger's model got further refined with the addition of dimensions of perceived risk and product involvement. Product involvement related to how involved the users were in associated product categories. Users exposed to ATMs were more likely to adopt Internet banking than risk-averse households. It was also postulated that perceived innovation attributes appear to be better predictors of adoption behaviour than personal characteristics (Lockett and Littler, 1997).

Another important model of innovation diffusion was proposed by Davis (1989) namely, Technology Acceptance Model (henceforth, TAM) that incorporated the characteristics of perceived ease of use and perceived usefulness into a model of technology acceptance.

Perceived usefulness is the extent to which a user has a belief that using a particular innovation would improve his or her job. The genesis of this factor has roots in Theory of Reasoned Action Model (henceforth, TRA) which postulates that perceived usefulness impacts IT usage due to reinforcement values of outcomes. The assumption that consumers' behaviour is rational and they collate and evaluate all the accessible information systematically is inherent in this
theory. It also assumes that people consider the results of their possible actions and consequently decide whether to act or not. TRA not only states that it is the individual’s perceptions and beliefs that affect behaviour but also indicates that the social influences may also have a role in influencing behaviour (Ajzen, 1985). Other studies by Thompson et al. (1991) and Robey (1979) also suggest that perceived usefulness is positively associated with IT usage.

Perceived ease of use refers to the degree to which a person believes that using a particular system or technology would be effortless. This is considered an important determinant of IT usage and a contributor to behaviour pattern of individuals (Mathieson, 1991).

TAM is basically an adaptation of TRA specifically designed to explain computer usage behaviour and its main purpose is to provide a framework for the measurement of the impact of external factors on internal beliefs, attitudes and intentions. TAM and TRA while sharing many aspects differ significantly in two areas.

First, TRA postulates that beliefs and attitudes are contextual in nature and hence generalizations are not possible whereas TAM states that perceived ease of use and perceived usefulness have an effect on acceptance of all IT systems.

Second, in TRA all beliefs are summed together whereas in TAM both the beliefs are viewed as separate constructs.

Davis et al. (1989) on their research on improving user acceptance postulated that although ease of use is clearly important, the usefulness of the system is even more important. While the users may make an extra effort to use a difficult
innovation if they believe it will lead to better functionality which is critical and important but the same may not hold true for ease of use. No ease of use level is sufficient for users to be goaded into trying new innovations if it doesn't lead to some useful task.

After a review of 105 articles in the area of innovation, five more characteristics that influenced IT adoption were added which were cost, communicability, divisibility, profitability and social approval (Tornatzky and Fleischer, 1990).

With so much research work going on in the area of innovation diffusion, a need was felt for an instrument to measure the variety of perceptions of innovations. Moore and Benbasat (1991) developed a comprehensive instrument designed to examine the decision to adopt an IT innovation. They also added two other constructs: image defined as ‘the degree to which use of an innovation is perceived to enhance one’s image or status in one’s social system’ and voluntariness of use, “the degree to which use of the innovation is perceived as being voluntary, or of free will”.

TAM model has been expanded by further research into diffusion of technological innovations to include individual differences and attitudes as defined by the TRA (Davis et al., 1989; Karahanna et al., 1999; Venkatesh and Morris, 2000).

Individuals, as suggested by research, may also be motivated to use IT due to intrinsic factors such as enjoyment and usefulness or due to external factors such as social pressure (Deci, 1975). Research work on diffusion of technological innovations has expanded the TAM model to include individual differences (Gattiker, 1992; Gefen and Straub, 1997; Taylor and Todd, 1995; Mick and
Fournier, 1998) and attitudes as defined by the Theory of Reasoned Action (Davis et al., 1989; Karahanna et al., 1999; Venkatesh and Morris, 2000). The diversity of the background of the employees in an organization can increase the number of information sources to know about the existence of an innovation (Cohn and Turyn, 1984).

Size of an organization has been found to have a positive correlation with the innovation adoption processes in the organization. It may provide the critical mass that justifies the adoption of particular innovations. For larger organizations, there may be a greater need to adopt some innovations than for smaller ones (Zaltman et al., 1973). There are several organization structure variables that have been found to have an impact on the innovativeness of an organization. A higher level of organizational complexity denoted by the number of specialists in the organization and their professionalism may facilitate adoption of an innovation (Hage and Aiken, 1970).

The number of information sources may become larger with greater diversity in the background of the members of an organization enabling an organization to become aware of an innovation (Cohn and Turyn, 1984).

Although gender does not seem to have any direct correlation with adoption of innovations except for different acceptance rates amongst men and women whereas a correlation seems to exist between age and adoption of technologies with younger persons more likely to adopt (Zeithmal and Gilly, 1987; Trocchia and Janda, 2000). Increases in income and education also tend to be positively related to the adoption of an innovation (Labay and Kinnear, 1981).
Personal computers introduction diffused more rapidly among organizations that had prior exposure to mainframes and minicomputers. The pre-existing knowledge base of users and its linkage with the innovation being introduced in the organization does seem to have a positive correlation with IT adoption process (Cohen and Levinthal, 1990).

Darmawan (2001) has suggested a comprehensive model on IT diffusion which is based on a variety of factors, viz., technological, institutional, personal, social and economic, that may influence the outcome of adopting and implementing IT in local governments.

By synthesizing various stages of innovation adoption process proposed by previous authors, Daramwan (2001) presented a four phase conceptual model of innovation adoption and implementation process consisting of initiation phase, adoption phase, implementation phase, and evaluation phase. Possible adopters of the technology are organizations, organizational units, organizational sub units, and individuals.

In this study, two levels of adoption are considered. The first level of adoption, organizational level adoption, commences when an organization starts realizing the need for strategic change and decides to incorporate IT. This level ends with the acquisition of technology. The second level of adoption, individual level adoption, begins with the acquisition of the technology, and finishes when the technology is utilized and operative.
2.4.2 IT Adoption and Information Characteristics & its processing

The quantity, quality and value of the information available has a significant influence on the chances that an organization adopts an innovation over time (Webster, 1969). The information availability is a function of the level of communication of the suppliers of a particular innovation. It also depends on the level to which the potential adopters interact with other adopters, advisors and consultants. Literature affirms that the communication effort of the innovation supplier is more crucial in the knowledge phase of the IT adoption process whereas the interaction with third parties is more important during the persuasion stage of the adoption process (Rogers, 1962). It is the information processing characteristics of the decision makers that has been found to have significant impact on them becoming adopters or non adopters of an innovation. The greater the willingness a potential adopter displays to receive information on innovations and more his/her competence to process the information received, the higher is the probability of the innovation being adopted (Gatignon and Robertson, 1989). This pertains to the absorption capacity of the potential adopter, which is basically the knowledge, and ability of a firm to evaluate and process information to make efficient use of the information (Baldwin and Scott, 1987).

2.4.3 IT Adoption and IT Usage: Their distinctiveness

Most of the research studies have concentrated on studying the end user beliefs and attitudes about innovations after they have been adopted and start getting used. Consequently these beliefs are those that are held by users for continued use of IT. These may differ from the beliefs that initially led to IT adoption. These
differences have been supported by consumer behaviour research (Howard and Seth, 1969) and cognitive dissonance theory (Cummings and Venkatesan, 1976). These theories indicate that the use of an innovation/product affects and may alter one's perceptions, attitudes and needs with respect to that innovation. Hence the beliefs and attitudes after the use of a product may not be same as the beliefs that were there during the initial adoption phase. The literature on innovation diffusion supports these premises by signifying that it may be the sociological variables that may be of more importance in mental acceptance of the innovations while economic variables may be more crucial in explaining use (Klonglan and Coward, 1970). It has been corroborated by research studies that social norms may have a more marked effect in guiding behaviour when the behaviour is new in relation with an innovation. Their influence on behaviour will start waning as users become more experienced (Traindis, 1971).

Similar other studies in the IS implementation literature suggest that while ease of use is a significant determinant of use after one hour of use of IT, it has a non significant effect on use after 14 weeks of usage (Davis et al., 1989). Additionally the impact of social norms on usage was more for inexperienced than for experienced users (Thompson et al., 1994).

Differentiation of diffusion of innovations during the adoption stage and the implementation stage has been supported by literature. In this two stage process, adoption denotes the degree to which a technology has been introduced into an organization, while implementation refers to the degree to which the technology has been put to use in the activities and processes of the organization (Rai and Patnayakuni, 1996).
2.4.4 IT Adoption and Organizational Learning

The literature on organizational learning and technology diffusion suggests that the adoption of new technologies and innovations leads to creation of new knowledge (Attewell, 1992). Thought literature emphasizes that the learning is central in any innovation adoption process, but this view distinguishes between learning about the availability and the benefits of any new technology and the learning required to absorb and use an innovation.

2.4.5 IT Adoption & Uncertainty

Uncertainty has been found to have a significant impact on the innovation adoption process in an organization. The potential adopters could feel uncertain if the advantages claimed for an innovation adoption are unrealistic as the extent of the advantages of an innovation are not certain before they have been adopted. Additionally there is an element of uncertainty regarding the implementation efforts required for an innovation in an organization. As it is generally difficult to forecast all the efforts that may be required prior to the adoption process of an innovation, hence these types of uncertainties regarding an innovation might make a potential adopter post-pone the decision either to adopt or reject the innovation (Nooteboom, 1989; Gatignon and Robertson, 1985). It is quite likely that despite positive expectation from a technology innovation, organizations may still fail to invest in or adopt a new technology because of the adoption risks. In such situations the technology diffusion will be a function of the share of risks that technology vendors are ready to take (Shapiro & Varian, 1998).
2.4.6 IT Adoption & Innovation Classifications

The technology adoption and innovation diffusion is one of the most widely researched areas but still there are many aspects of technology adoption that give rise to yield inconsistent results (Wolfe, 1994). One of the probable reasons for this inconsistency could be the general tendency to consider all innovation adoptions in the same manner. To address this aspect several efforts have been made to classify innovations into different categories. Innovations have been categorized as administrative and technical (Daft, 1978; Kimberly and Evansiko, 1981; Damanpour, 1987), radical and incremental (Dewar and Dutton, 1986; Ettlie et al., 1984), and initiation and implementation (Zmud, 1982).

2.4.7 IT Adoption & Organizational Characteristics

Damanpour (1991) has proposed a set of organizational characteristics that influence any organizational innovation adoption process. As per the study the ten positive organizational determinants are Specialization, Functional Differentiation, Professionalism, Managerial Attitude toward change, Managerial Tenure, Technical Knowledge Resources, Administrative Intensity, Slack Resources, External Communication, Internal Communication whereas the three negative organizational determinants are Formalization, Centralization and Vertical Differentiation.

Another categorization suggested is such that the factors influencing IT adoptions are divided into Structural characteristics viz. Size, Sector, Location and Age; Organization variables viz. Composition and Training of the Workforce, Labor Cost, R&D, Product & Process Innovation, Collaboration with other organizations.
and Subcontracting activity; Performance variables viz. Export propensity and Employment Variation (Giunta and Trivieri, 2004). Research studies also suggest that the factors that may result into a successful technology adoption may include the numbers of adopters in the organization, the extent of use of the innovation and the level of its impact in then organization (Cooper and Zmud, 1990). Some other factors that influence the technology adoption process are interaction of people, organizational issues and the technology applications within the company (Lorenzi and Riley, 1995; Lorenzi et al. 1995). In any innovation implementation project, a variety of expertise is needed and the behaviour of managers as well as users and how they form opinions about the innovations become critical for success for any innovation adoption (Chiasson and Lovato, 2001; Png et al., 2001).

2.4.8 Limitations of the IT Adoption theoretical Models

Classical innovation attributes alone are not perceived to be strong predictors of organizational technology adoptions (Fichman, 1992). Additional factors are needed to be identified and considered. Zmud (1982) summarized that prior research failed to consider that innovation attributes get perceived differently depending on organizational context.

It was apparent that there were more variables than innovation attributes alone that may explain the adoption process in organizations better. Several additional contexts have already been identified. Organizational and task considerations have been found to be important for information technology implementation (Cooper and Zmud, 1990). Another study found out the
importance of individual, organizational and contextual variables for innovation adoption (Kimberley and Evansiko, 1981). Tomatzky and Fleischer (1990) examined the innovation adoption processes in various organizations and proposed a fairly comprehensive framework that essentially suggests that a technology adoption decision of an organization can be jointly explained by the organizational, technological, and environmental contexts.

Technological context refers to the technology that is planned to be introduced or is under consideration and also the benefits expected from its use by the target users. Organizational context refers to the framework of internal conditions that lead to the organizational readiness to adopt a technology. Lastly, the environmental context refers to the external world or environment in which an organization operates and exists.

2.4.3 IT Adoption in Banks

In the markets like US, which adopted most of the technologies and particularly e-banking technologies earlier, various lessons become evident and need to be properly understood for possible applications in emerging markets like India. In e-banking technologies arena, some e-banking technologies have grown fast in the US market while others have not had a similar growth and have been adopted more slowly (Kolodinsky et al., 2004).

It is considered to be prudent to recognize the factors that impact the acceptance of new product introductions so that banks can provide an appropriate environment and deploy suitable strategies that will lead to broad-basing the users and customers. Research has shown that while banks were ready and willing to
adopt new e-banking technologies, the customers needed reassurance that their problems will be resolved and transactions will remain personal and secrecy maintained (Goldfarb, 2001). It has been shown that nearly one third of consumers who had signed up for e banking had stopped using it due to unsatisfactory customer service or complexities in using the service (American Banker, 2000).

It has been found that in less developed countries many IT systems and investments are under utilized and hence may not be having a role in enhancing the performance of organizations (Foster and Cornford, 1992; Odedra et al., 1993).

Considerable work has been done in understanding the motivating factors that influence the acceptance of IT but most of the empirical data is based on studies conducted in USA (Hassan, 1990; Igbaria, 1993). As national culture influences IT utilization, generalizing findings of US based studies to different countries may lack validity (Deans et al., 1991) as the technology has been described as a culturally embedded, value laden activity implying that technology use has a strong cultural component (Nelson and Clark, 1994). Palvia and Sarawat (1992) too have highlighted the importance of country specific factors such as culture in determining the effectiveness of information systems.

US as a country is characterized by high individualism and low uncertainty avoidance suggesting that developed countries are dominated by individuals with doing oriented cultures (Maznevski and DiStefano, 1995), whereas developing countries would have a culture characterized by low individualism and moderate to high uncertainty avoidance. Thus the response of individuals in developing
countries would be a shade different than that of developed world due to the various factors impacting any innovation adoption process.

Another cultural dimension quite distinct from Hofstede’s dimensions of culture is the abstractive versus associative character of culture which also influences IT adoption processes. This dimension evaluates patterns of thinking and perceptions that affect various aspects of user behaviour.

In abstractive cultures people think and behave in a linear fashion based on a rational cause and effect paradigm to create perceptions as prevalent in US and Europe etc. In associative cultures there is generally a diffusion of perceptions and behaviour and associations are formed among events that may not have or appear to have any logical basis. One can find it typically in Africa, Asia and Middle East (Kedia and Bhagat, 1991).

2.5 Overview of Indian Banking Industry

2.5.1 Introduction

To get an overview of Indian Banking industry, its various challenges and consequent appropriate strategies and responses that are getting generated, it is important to trace its evolution historically that have shaped up this industry. Its interaction with external factors, like societal requirements, governmental objectives, globalisation aspects, competitive intensity and etc.; and internal factors like evolving human resource competencies, changing strategic directions, reforming marketing mix have been extensively reviewed. This helps in getting an understanding of the interaction of these factors with the banking industry’s IT adoption strategies.
Investorwords, a webportal, defines the word bank as an organization, usually a corporation, chartered by a state or federal government which does most or all of the following: receives demand deposits and time deposits, honours instrument drawn on them, pays interest on them; discounts notes, makes loans, and invests in securities; collects cheques, drafts and notes; certifies depositors cheques; issues drafts and cashier cheques.

Indian Banking Regulation Act, 1949, Section 5(b), has defined the banking company as any company which transacts business of banking in India and the banking function has been defined as the accepting of deposit of money from the public for the purpose of lending or investment, which are repayable on demand or otherwise and are withdraw able by cheque, draft, order or otherwise. Section 6 of Banking Regulations Act, 1949 elaborately specifies the other forms of business that a banking company may carry in addition to banking as defined in Section 5 (Ghosh & Bagheri, 2006).

Investorglossary, a webportal, defines a commercial bank as a type of financial intermediary and a type of bank that raises funds by collecting deposits from businesses and consumers via checkable deposits, savings deposits and time deposits. It provides loans to businesses and consumers and also buys corporate bonds and government bonds. Its primary liabilities are deposits and primary assets are loans and bonds. As this is what people normally call a bank the term commercial was used to distinguish it from an investment bank or a development bank.

Some major activities that are generally performed by banks are listed below:
Creation of money by way of deposit liabilities that are generally accepted as a means of payment,

Managing the payment systems not only through cheques but also through various other instruments like credit cards, debit cards, ATMs etc.,

Creation of indirect financial securities by acting as financial intermediaries between the final lender and final borrower,

Acting as information agents owing to an asymmetric supply of information due to borrowers choosing not to make relevant information publicly available,

Acting as investors for depositors,

Dealing in foreign currencies

These include in a nutshell

Issuing Demand Drafts & Traveler’s Cheques

Collection of Cheques, Bills of exchange

Discounting and purchase of Bills

Safe Deposit Lockers

Issuing Letters of Credit & Letters of Guarantee

Sales and Purchase of Foreign Exchange

Custodial Services

Investment Services
Doing all such other things as are incidental or conducive to the promotion or advancement of the business of the company

Any other form of business which the Central Government may, by notification in the official Gazette, specify as a form of business in which it is lawful for a banking company to engage.

The beginning of current form of banking can be traced to the entity Banco di Rialto which was founded in Venice in 1587. ‘Banco di Rialto’ accepted demand deposits and permitted depositors to transfer their credits by checks. What it was not allowed to do was provide loans or pay interest on deposits. As its expenses were paid by the city hence its services were free (Fratianni and Spinelli, 2005).

Banking in India can trace its roots right up to the Vedic period. The transition from money lending to banking is believed to have happened before the time of Manu the Rishi. A special section on the subject of deposits and pledges can be found in one of the old law books of ancient India called Manusmriti (Tannan et al., 2001).

It was in 1926 that the Hilton Young Commission recommended the establishment of a separate central bank in the country. A bill to this effect was introduced in 1933 that led to the establishment of Reserve Bank of India (henceforth, RBI) in April, 1935 as the central bank of the country (Chugh, 2005).

2.5.2 Phases of Reforms in Indian Banking Industry

While tracing the history and evolution of the Indian banking system, three distinct phases can be identified (Kannan, 2005). These are
Phase I: Early phase from 1786 to 1954

Phase II: The nationalization of banks and up to 1991 prior to beginning of banking sector reforms

Phase III: New phase of Indian banking with the start of Financial and Banking Sector reforms post 1991.

Phase I was the traditional or conservative phase and was characterized by slow growth and periodic failures of banks. In the period 1913 to 1948, as many as 1100 banks failed causing justifiable concern amongst all stakeholders.

Government of India reacted by enacting The Banking Companies Act, 1949. The title of this Act was changed as “Banking Regulation Act, 1949” as per amending Act of 1965 and this act was the first regulatory step taken by the Government of India to streamline the functioning and activities of the commercial banks in India. Extensive powers were given to RBI as the central banking authority for effective supervision of banks.

In the Phase II, Government of India launched its process of nationalization in 1955 and nationalized Imperial Bank of India to form State Bank of India (henceforth, SBI). The declared objective of nationalization was extension of banking facilities on a large scale, more particularly in the rural and semi-urban areas, and for diverse other public purposes.

SBI’s stated role was to act as the principal agent of the RBI and handle banking transactions of the Union and State Governments throughout India. SBI was required to fulfil the social objectives of the Government of India by opening the targeted number of branches within 5 years in the areas where bank branches did
not exist. These branches which would be non remunerative were to be subsidized by the Government of India (Chandavarkar, 1959).

In 1960 additional seven banks were nationalized which became the subsidiaries of SBI. This action brought one third of the banking segment under the Government of India’s control. The nationalization process continued further with Government of India nationalizing 14 major commercial banks in 1969 and seven more banks in 1980 thus bringing 80 percent of the banking segment under Government’s control (Sathye, 2005).

On one hand this process did pay rich dividends due to development of a widespread network of the banking structure in the country but on the other hand the nationalized banks in their enthusiasm for development banking concentrated exclusively on branch opening, deposit accretion and social banking while neglecting prudential norms like profitability criteria, risk management and building adequate capital (Burgess et al., 2005; Burgess and Pande, 2005; Kochar, 2005).

In the 3rd Phase the reforms started with a focus on NPAs and the objective became to introduce elements of market incentive as a dominant factor gradually replacing the administratively coordinated actions for development and these necessitated changes in monetary policy, regulatory environment, structural transformations and the character of the self-regulatory organizations (Biswas and Deb, 2004).

This environment promoted competition by permitting entry of private sector banks and liberal licensing of more branches by foreign banks in addition to entry
of new foreign banks. The regulation and supervision norms followed the international best practices. The reforms process continued and in 1999, a range of measures were announced to strengthen the banking segment as per the recommendations of the second Narasimham Committee, the mid-term review of the Monetary and Credit Policy of October 1999. Competition was deployed as a policy tool in banking sector reforms to increase efficiency and productivity. The foreign banks entry was liberalized and guidelines were issued for establishing new banks in private sector which led to twelve new private banks coming up since 1993. The reforms were also directed at legal and institutional side of banking (Kirkpatrick and Arun, 2003).

Purwar (2003) summarized some of the major reform initiatives in the last decade that changed the face of the Indian banking and financial sector as under:

- Interest rate deregulation
- Adoption of prudential norms in terms of capital adequacy, asset classification, income recognition, provisioning, exposure limits, investment fluctuation reserve
- Reduction in preemptions, lowering of reserve requirements (SLR & CRR), thus releasing more lendable resources which banks can deploy profitably.
- Reduction of Government equity in banks and allowing strong banks to access the capital market for raising additional capital
Greater operational freedom in opening and swapping of branches and
greater flexibility in recruitment for banks with a track record of
profitability

Allowing new private sector banks entry and foreign banks to expand
operations including through subsidiaries

New areas opened up for banking viz. insurance, credit cards,
infrastructure financing, leasing, gold banking, besides investment
banking, asset management, factoring etc.

Introduction of new instruments for greater flexibility and better risk
management e.g. interest rate swaps, forward rate contracts, forward cover
to hedge inflows under foreign direct investment, liquidity adjustment
facility for meeting day to day liquidity mismatch

Setting up of several new institutions viz. National Securities Depositories
Ltd., Central Depositories Services Ltd., Clearing Corporation of India
Ltd., Credit Information Bureau India Ltd.

Liberalization of limits for investment in overseas markets by banks

Introduction of Universal Banking by permitting them to diversify into
long-term finance

Strengthening of technology infrastructure for payments and settlement
system in the country with electronic funds transfer, centralized funds
management system, structured financial messaging solution, negotiated
dealing system, and movement towards real time gross settlement
Adoption of global standards and practices

Issuance of guidelines for risk management systems in banks

Increase in limit for foreign direct investment in private banks

Launching of wide ranging reforms in the area of capital markets

The introduction of new technology in the banking sector is also changing the skill requirements in banking. A study conducted by Organization for Economic Co-operation and Development (OECD) compared the old competencies with the emerging new competencies in a study on the impact of technology on human resources employed in banking and insurance companies in France, Japan, Germany, Sweden and United States of America. In this study authors compared the old competencies with the emerging new competencies and the findings were as follows (Mankidy, 2000):

These resultant new skills would need not only new knowledge but also behavioural adjustments in the existing human resources. And it is because of this that training will become an important intervention tool in the industry to be integrated in any strategic direction that the top management may envision.

<table>
<thead>
<tr>
<th>Old Competencies</th>
<th>New Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ability to operate in well defined and stable environment</td>
<td>• Ability to operate in ill defined and ever changing environment</td>
</tr>
<tr>
<td>• Capacity to deal with repetitive straight-forward and concrete work process</td>
<td>• Capability to deal with routine and abstract work process</td>
</tr>
</tbody>
</table>
• Ability to operate in a supervised work environment
• Isolated work
• Ability to operate within narrow geographical and time horizons
• Broad unspecified knowledge
• Procedural competencies

• Ability to handle decisions and responsibilities
• Group work, Interactive work
• System wide understanding, ability to operate within expanding geographical and time horizons
• Specialized knowledge
• Customer assistance oriented competencies

Another activity which is being viewed as a strategic option by banks to mobilize sufficient capital for backing assets as well as invest in technology is the merger option.

Over the last few years some of the mergers that have been happened are as follows (Gupta and Kundu, 2005):

- Laxmi Commercial Bank with Canara Bank in 1985
- Miraj State Bank with State Bank of India in 1985
- Hindustan Commercial with Union Bank of India in 1986
- Traders Bank with Punjab National Bank in 1988
- United Industrial Bank with Allahabad Bank in 1990
- Bank of Tamilnadu with Indian Overseas Bank in 1990
- Bank of Thanjavur with Indian Bank in 1990
- Parur Central Bank with Bank of India in 1990
- Purbachal bank with Central Bank of India in 1991
- New Bank of India with Punjab National Bank in 1994
- Bank of Karad with Bank of India in 1994
- Kashinath Seth Bank with State Bank of India in 1996
- Punjab Cooperative Bank with Oriental Bank of Commerce in 1997
- Bareilly Corporation Bank with Bank of Baroda in 1999
- Sikkim Bank with Union Bank of India in 1999
Times Bank with HDFC Bank in 2000
Bank of Mathura with ICICI Bank in 2001

The effectiveness of this strategy will become more apparent as the strengths and weaknesses of this strategic option in Indian context become visible with time.

2.5.3 Beginning of IT in Indian Banking Industry

When State Bank of India came into being, it was given a mandate of a massive branch expansion program particularly in rural areas. This resulted into an explosion in the volumes of transactions. The inter-branch reconciliation became a serious management problem that defied manual handling.

At this juncture the step was taken to introduce mechanization in banking processes by installing ICL 40 column punched card equipment in the late 50s in the Calcutta branch of SBI. It did not prove to be enough as it could not keep pace with the branch expansion, hence the bank decided to go in for its first computer, an IBM 1401, supported by a battery of about one hundred 80-column punched card machines for data input. This led to a revamping of reconciliation of transactions. Other leading banks too started following suit. As the business grew, the volume of transactions started putting tremendous pressure on customer handling leading to rise of customer dissatisfaction. Although the trade unionism remained active but still it started becoming apparent that unless computerization of customer accounts and other banking services like remittances etc. was achieved, the situation will only worsen further (Ramani and Gupta, 2001; Rishi and Saxena, 2004).
2.5.4 Rangarajan Committees for Computerization

At this juncture, in the early 80s, RBI got into the act and set up two committees in quick succession to hasten the process of automation of banking operations. A high level committee was formed under the chairmanship of Dr. C Rangarajan, then Governor of the Reserve Bank of India, with a mandate to draw up a phased plan for computerization and mechanization in the banking industry over a five year time frame of 1985-89. The focus was on improving customer service and consequently two branch automation models were developed and implemented.

- Front office mechanization where front desk operations were computerized while back office work was done manually.

- Back office automation covering mechanization of General Ledger and back office operations while the front office work was done manually.

Both the models were meant to make available to the customers an error free accounting and a regular statement of accounts. Despite these being the right strategies at that time, their implementation was very slow and also faced a stiff resistance from employee unions. Keeping in mind this experience, second Rangarajan committee was constituted in 1988, which drew up a detailed plan for computerization in banks and for extension of automation to other areas like funds transfer, electronic mail, BANKNET, SWIFT, ATMs etc.

The committee recommended the following road map for computerization over the next five years:

- Around 2000 to 2500 large branches located at high activity centers to be fully computerized.
• Regional offices/ Zonal offices / Head offices to be computerized

• Inter and intra bank transactions to use the BANKNET set up by the RBI.

• Installation of a network of cash dispensers/ ATMs at strategic locations such as airports/ railway stations etc. on a shared basis by banks.

The committee also made studied recommendations on the Single Window Concept, all bank credit cards, credit clearing, office automation etc. (banknetindia.com)

2.5.5 Narasimham Committees on banking reforms

Sarkar (1999) opines that it was Narasimham Committee established in 1991 that had led the financial sector reforms liberalizing the Indian banking industry and opened it to competition from within and outside. It not only held unions responsible for their resistance to technology adoption but also alleged that that bank managers resisted the implementation of technology in the initial stages because of the lack of flexibility in restructuring employment in the face of automation. Eventually Narasimham Committee submitted two reports, in 1992 and 1998 that laid significant thrust on enhancing the efficiency and viability of the banking sector.

2.5.6 Role of Trade unions

Role of trade unions also played an important role in the evolution of IT in banks. There was a strong resistance from them to the technology adoption in bank
branches as they feared job losses due to this process. The situation changed in the 1990s when the liberalization measures introduced in the banking industry brought in competition in the form of new private banks and new foreign banks. Bank unions were put under tremendous pressure to permit the adoption of technology within banks.

Some salient features of the various union agreements are enumerated below to get a perspective on evolution of their role and influence on implementation of IT in Indian banking:

**Union Agreement 1983**

Accounting machine electric/electronic, other than computers may be utilized in banks for purposes like current account, savings bank account, G/L, CC and loan and salary and payroll.

No accounting machines to be placed at rural branches and no electronic machines with memory to be installed at semi-urban centers except for limited MIS and G/L accounts.

Computers including mini computers could be utilized for limited purposes in Area I centers clearing operation, reconciliation, foreign exchange transaction, investments, MIS, personnel inventory, PF and pension, merchant banking, salary and payroll.

Banks could use not more than one large computer installed at one center in each bank and the capacity of such computer should not exceed what the Reserve Bank of India is using from time to time.
Maintenance of existing staff strength and inflow would have to be commensurate with the expansion in banking industry.

Union Agreement 1987

Number of ALPMs i.e. Advanced Ledger Posting Machines up-to September 7, 1987 should be only 3500.

Maximum memory of an ALPM not to exceed 256 KB.

ALPMs must not be installed at semi-urban and rural centers.

Per machine voucher load 400 (for CA, OD, CC/ other loan accounts).

Not more than 2200 savings bank accounts to be taken on one machine.

ALPM to remain standalone machine dedicated to only one function

Linkages (networking) of two or more machines in the same department or outside would not be permissible.

Union Agreement 1988

Banks were allowed by unions to take up one branch in metropolitan centers for total branch computerization project on an experimental basis. These agreements paved the way for the introduction of ALPM for back-office automation.

An ALPM which was a single user PC with software for savings, cash, credit/overdraft, current accounts was focused more for back-office housekeeping than front office customer service
Union Agreement 1993

It was in October 1993, that a historic agreement was signed between the Indian banks' association and bank unions which marked a major turning point in the IT journey of the banks. It permitted computerization without any restrictions and provided for computerization of all branches having an average voucher load of more than 750 in urban and metropolitan areas.

All restrictions were removed on the type of hardware, capacity, number of machines etc. Banks were free to use communication facilities including PSDN, satellite etc. The agreement also allowed introduction of single window concept in branches. This agreement laid the ground for IT to start emerging as a strategic component for the bank managements to consider seriously (Rishi and Saxena, 2004).

2.5.7 IT Act 2000

IT Act 2000 became another enabler for the IT adoption in the organizations. It provides legal framework for the use and misuse of IT. IT Act 2000 as an act affords legal recognition for the transactions that are carried out by data interchange and other methods available in electronic commerce. It encompasses the use of various alternatives to paper based methods of communication and storage of information and facilitates electronic filing of documents with the Government agencies (Duggal, 2000).

It has accorded legal sanctity to information technology based transactions by amending the Indian Penal Code, the Indian Evidence Act 1872, the Bankers’ Books Evidence Act, 1891 and the Reserve Bank of India Act, 1934 and
addressed some of the longstanding issues of the banking industry. The Act has provided solutions to issues of data protection, computer misuse, admissibility of electronic record as evidence, electronic record keeping and digital signatures. What is still left out of the ambit of this Act is treating electronic funds transfer on par with crossed cheques/drafts for purposes of income tax, clarification on payment finality in case of Electronic funds transfers and the rights and obligations of parties involved in Electronic Funds Transfer (Vartak, 2004).

2.5.8 Three Waves of IT in Indian Banking

Patrick (2005) described the journey of IT in Indian banking industry can in terms of three waves of changes. The first wave in banking technology started with the installation and use of Advanced Ledger Posting Machines (ALPMs) in the 1980s. RBI’s advisory was to go in for massive computerization at the branch level. As recommended by Dr. Rangarajan Committee banks could go for either for automation of front office or back office. Most of the banks opted for automation of the front office using ALPMs in the first phase.

In the second wave the concept of Total Branch Automation (TBA) came into being which required automation of both front office as well as back office of the branch with its own database.

It was the advent of the third wave, which started when private sector banks entered the Indian banking industry with a single centralized database thus launching the concept of core banking solutions.

Launch of Automatic Teller Machines (ATMs) empowered the customer to handle their own interactions. The new buzzwords include internet banking and mobile
banking with core focus being servicing a larger number of customers at a lower cost than traditional channels apart from providing the customer flexibility of choices.

2.5.9 RBI’s Role for IT in Indian Banking Industry

The RBI’s role in promotion of IT initiatives in Indian banking industry deserve special mention. As part of the restructuring of the banking sector, special emphasis was accorded to improvements in payment and settlement systems. Prominent among the measures initiated in these areas include introduction of Electronic Funds Transfer (EFT), Real Time Gross Settlement System (RTGS), Centralized Funds Management System (CFMS) and the Structured Financial Messaging Solution (SFMS). The SFMS would be the backbone for all message-based communication over the Indian Financial Network (INFINET).

The text in the RBI’s report dealing with Technology in banking dealing with the technology initiatives of RBI that made a significant contribution to the introduction of IT in Indian banking industry has been reproduced as under (Kannan 2005):

**Payment and Settlement Systems**

As part of the restructuring of the banking sector, special emphasis has been accorded to improvements in payment and settlement systems. Prominent among the measures initiated in these areas include introduction of Electronic Funds Transfer (EFT), Real Time Gross Settlement System (RTGS), Centralized Funds Management System (CFMS) and the Structured Financial Messaging Solution (SFMS). The SFMS would be the
backbone for all message-based communication over the Indian Financial Network (INFINET).

Electronic Funds Transfer (EFT)

The EFT scheme enables transfer of funds within and across cities and between branches of a bank and across banks. The scheme, which is operated by the reserve bank, is available for funds transfer across thirteen major cities in the country as on September 30, 2001. The facility is being extended to more cities. The scheme was originally intended for small value transactions. However, with effect from October 1, 2001, even large value transactions as high as Rs. 2 crores have been permitted.

Real Time Gross Settlement System (RTGS)

The work on operationalization included the finalization of the design for RTGS system, issue of tender for development of the software, evaluation of the technical components of the bids received, site visits and evaluation of various commercial proposals. This system is under development and implementation.

Centralized Funds Management System (CFMS)

The CFMS would enable the funds and treasury managers of commercial banks to obtain the consolidated account-wise, center wise position of their balances with all the 17 Deposit Accounts Departments of the Reserve Bank. The system has been tested prior to installation and phase-wise implementation commenced from November 2001. The CFMs would
enable better funds management by constituent current account holders of the Reserve Bank.

**Structured Financial Messaging Solution**

At the base of all inter-bank message transfers using the INFINET is the SFMS. SFMS would serve as a safe, secure communication carrier built with templates for transmission of intra and inter bank messages in fixed message formats, which would facilitate “Straight through Processing”. SFMS comprises of the central server in the form of a hub located at the Institute for Development and Research in Banking Technology (IDRBT), Hyderabad and individual bank gateways to which the branches of the banks would be connected with a provision for banks to have multiple bank level gateways. The SFMS would provide for all inter-bank transactions to be stored and switched at the central hub, while inter-bank messages will be switched and stored by the bank gateway. Adequate security in the form of smart card authentication apart from the Public Key Infrastructure (PKI) would be an integral part of the SFMS. All these would result in the security levels matching those of international standards.

**Imaging of Instruments**

A process of capturing the images of the instruments as they are being processed was introduced at the four metropolitan National Clearing Cells managed by the Reserve Bank. Imaging facilitates in quicker balancing
during the cheque processing cycle and also in reducing clearing reconciliation differences.

Electronic Clearing Services

Emphasis on widespread usage of Electronic Clearing Service is being prescribed by the Reserve Bank to encourage non-paper based funds movement. The prime thrust areas forming part of this vital activity include the extension of ECS to more centers, inclusion of more customers under the ambit of the scheme and provision of a centralized facility for affording payments.

Indian Financial Network (INFINET)

It started as a closed user group communication network for the banking sector in India, the members being the public sector banks. During the year 2000-2001, the membership was opened up for other banks and financial institutions that need to communicate with one another.

RBI also passed an order that all urban and metro branches of public sector banks must be computerized before 1.1.2001

Cheque Clearing

Magnetic Ink Character Recognition (MICR) based cheque clearing accounts for about 65 percent of the values of cheques processed in the country. In addition, magnetic media based clearing systems account for about 10 per cent of the remaining value while claim-based processes cover the rest of clearing. It may be pertinent to note that growth in cheque
volumes has decelerated to 10 percent in 2000-01 from 12 percent during the previous year. This is reflective of the general tend the world over, indicating the migration towards electronic funds transfer mechanisms.

Apart from these initiatives, on the recommendations of Committee on Financial Sector Reforms (also known as second Narsimham committee) a committee on Technology up-gradation was set up by the RBI for the Banking sector in 1994.

This committee looked into the following issues:

- Encryption of Public Switching Telephone Network (PSTN) lines
- Admission of electronic files as evidence
- Record Keeping
- Modalities for a satellite based WAN for banks and financial institutions with the necessary security systems by banks and other financial institutions, to ultimately develop a sound and an efficient payments system.
- Methods by which technological up-gradation in banks and financial institutions could be effected and in the context study the feasibility of establishment of standards, designing payment system backbone and standards relating to security levels, messages and smart cards.

This committee also realized the urgency of setting up training centers and colleges for upgrading the technical skills of the banking manpower. Banks and financial institutions worked on this area and established technology based training centers and colleges.
However what was missing was an apex level institute that could act like a Think-tank and brain trust for banking technology. As recommended by the committee, IDRBT was established by RBI in 1996 as an autonomous centre for Development and Research in Banking Technology at Hyderabad.

2.5.10 Banking Software and other IT Aspects

The Software packages for banking applications in India had their beginning in the middle of 80s when the banks, spurred on by RBI and the Rangarajan Committee report, started computerizing the branches in a limited manner. The approach was to empanel a few hardware vendors who will also develop the software as per the bank’s specifications and help to install these at the branches. These packages were written usually in Foxpro or C and predominantly were DOS based.

The early 90s saw banks going in for TBA or Total Branch Automation packages. Architecturally some were centralized solutions with a powerful central server maintaining the database and with multiple terminals while others went in for distributed processing with multiple PCs linked to a LAN. The platforms used, ranged from simple UNIX C to powerful RDBMSs (www.banknetindia.com/special/itb1.htm).

Pentsoft Technologies, BankFlow from Datanet Systems, MIBAS & BIBAS from Nelito, Robust from Rolta India, Psibm from PSI Data Systems etc.

TBA as a product category as well as its implementation has reached a level of maturity in leading Indian banks which are already in the process of migration to core banking solutions that appear to provide solutions to meet better the customer demands at lower price per customer hence also providing the ability to combat the competitive intensity.

A typical TBA solution is modular in structure and generally has modules for:

- Demand liabilities like savings, current, flex deposits
- Time liabilities like term deposits
- Fund based advances like cash credit, overdraft, loans, bills discounting
- Non-Fund based advances like bank guarantees, letters of credit;
- Customer Services like Cheque book issue, lockers, pensions
- Remittances like demand drafts, pay orders, mail transfers, telegraphic transfers
- Online Transaction processing for cash, transfer and clearing
- Signature & photograph maintenance and retrieval
- Non Performing Assets,
- Shares accounting
- Branch general ledger accounting
Most TBA solutions on the offer would have a mix of these modules with their names varying but basically performing similar functions as the needs of the branches that they serve are similar.

With the advent of core banking solutions that appear more customer friendly and which convert a customer from a branch customer to bank customer even these Total Branch Automation Solutions have got add-on modules like Any branch banking, Forex, Extension Counter, Service branch, Relationship banking etc. (Rishi and Saxena, 2004).

The factors that are driving banks to move to core banking from various stages of TBA implementations constitute rising customer expectations, competitive intensity, regulatory requirements, operational efficiency, Basel II preparations, a better security environment, real time delivery channel transactions and global trend towards centralized banking. The core banking generally involves centralized processing with IT applications & data residing at central data centre to which branches & administrative offices are connected.

2.5.11 Basel Capital Accord: Implications for Information technology

‘First Basel Capital Accord’ which is the current system used for evaluating capital adequacy, was implemented in 1988 by the Basel Committee on Banking Supervision.

This accord termed as Basel I set the minimum regulatory capital for banks at 8 percent of the risk weighted value of their assets. More than 100 countries have adopted these guidelines. Basel I guidelines were found to be too simplistic to address the needs of the banking system in this changing environment of new
innovations, increasing globalisation and competitive intensity. The Basel Committee has been developing a new accord, Basel II to address the shortcomings of the current accord and to reflect the new developments in the assessment and management of risk. It rests on three mutually reinforcing pillars, minimum capital requirements, supervisory review and market discipline (Griffith-Jones and Spratt, 2002).

One of the requirements of Basel II which is directly related to IT is to build up 10 years data of all the customers and that includes all retail as well as corporate clients. To meet these objectives that include data collection, computation of the audit trail and reporting between the various departments and across various levels within banks, technology becomes essential. Data Collection, networking and risk management are the key areas where banks will need to implement technology in their efforts to achieve standardization (Saidenberg and Schuermann, 2003).

2.5.12 e-Security

Banks are in the process of increasing connectivity between their IT systems of inter city branches as well as setting up WANs in addition to connecting this infrastructure to the Internet for customers. This is resulting in increase of a wide variety of threats and vulnerabilities.

The threats include websites getting defaced, denial of service attacks, theft of credit card, information, a wide array of viruses and worms that threaten the information system resources thus making network security a major issue to be tackled. This has necessitated an institutional review mechanism for policies,
practices, measures and procedures to review e-security and evaluate their efficacy (Mohan 2004).

The Reserve Bank of India constituted a 'Working Group for Information System Security for the Banking and Financial Sector' in 2001. The Group’s recommendations have been the basis for the Information Systems Audit Policy for many banks and other financial entities.

2.5.13 Current Industry Structure

Generally, the banks in India are at one or mix of the various levels of automation as depicted in the Figure 1.

All the banks are at one of these levels of automation

Manual Process → Spreadsheet → Total Branch Automation

Connectivity between branches

EPM Solutions ← Enterprise solutions for CRM, HRM. → Core Banking

Figure 1. Various Stages of Automation in Indian Banks

The banking system consists of three tiers. These tiers consist of the scheduled commercial banks, the regional rural banks which operate in rural areas not covered by the scheduled banks and the cooperative and special purpose rural banks (Kannan, 2005).
The commercial banking structure in India can be broadly classified into two major categories viz., Non-Scheduled banks and Scheduled banks. Scheduled banks comprise of commercial banks and the cooperative banks. Scheduled commercial banks constitute those banks that have been included in the Second Schedule of Reserve Bank of India Act, 1934. RBI in turn includes only those banks in this schedule that satisfy the criteria laid down vide section 42(60) of the Act. This status subjects the banks to certain conditions and obligations towards the reserve regulations of RBI.

The scheduled banking structure in India as on March 2003 as enumerated by Indian Banks Association is as follows and is depicted in Figure 2 and Table 2.

The Scheduled Banks in India can be divided into two categories

- Scheduled Commercial Banks
- Scheduled Co-operative Banks

Scheduled Commercial Banks are further subdivided into:

1. Public Sector Banks
   1A. Nationalized Banks
   1B. SBI & its Subsidiaries

2. Private Sector Banks
   2A. Old Private Sector Banks
   2B. New Private Sector Banks

3. Foreign Banks
4. Regional Rural Banks

Thus under scheduled commercial banks there are 6 distinct categories of banks. Similarly Scheduled Co-operative Banks are divided into 2 categories.

1. Scheduled Urban Co-operative Banks

2. Scheduled State Co-operative Banks

The non-scheduled banks are not governed under either strict rules or supervision and neither relevant data is available for them. Similarly cooperative Banks in India do not have the relevant data that can be vouched upon and there are a lot of issues allegedly on their governance.

Hence for this study the focus has been on scheduled commercial banks sans regional rural banks. Regional rural banks comprise of less than 2 percent of total country's loans and advances. The major share in loans and advances is cornered by Public Sector Banks and amongst them the leader with around 25 percent market share is State Bank of India and its subsidiaries.

2.6 Implications for this Study

There is a plethora of reports and studies with findings that many technologies that are adopted by organizations are either not implemented or implemented partially even over long periods of time. This assimilation gap between adoption and implementation is particularly true in case of technologies with high implementation complexity (Fichman and Kemerer, 1997, Agarwal et al., 1997). However for the purpose of this study information technology adoption is considered in the context of Zaltman et al. (1973) as a two step process.
Organizations first decide to adopt an innovation and then actually implement it. An effective IT adoption requires a good deal of planning, proper strategy as per the business context and openness to change. This assumes importance, as information technology tends to create increasingly complex internal and external demands on the information management capabilities of organizations (Rivera and Casias, 2001; Rogers, 2001).

Lots of research studies have combined elements of Rogers’ Diffusion of Innovation theory and Davis’ TAM due to many similarities between them (Agarwal and Prasad, 1997; Thompson et al., 1991). Similarly for this study these two models act as foundations on which modified model has been proposed. They were suitably modified and tailored to focus on the research objectives of the study.

It has also been noticed that the support for these foundation models in IT adoption scenarios in organizations is not overwhelming. The reasons could be the
high level of complexities in terms of the technology itself (Attewell, 1992) as well as high implementation complexity spread over many adopters who may be scattered across various departments or geographic locations (Leonard-Barton, 1998).

The researchers are advised to evaluate replacing the foundation models or integrating them with new theories such as critical mass (Markus, 1987),

### Table 2. Structure of Indian Commercial Banks 2003 (As on March 2003) (Rs In Crores)

<table>
<thead>
<tr>
<th>Bank Group</th>
<th>No of Banks</th>
<th>Deposits</th>
<th>Capital</th>
<th>Reserves</th>
<th>Total Assets</th>
<th>Borrowings</th>
<th>Investments</th>
<th>Loans &amp; Advances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Sector Banks</td>
<td>27</td>
<td>1079393</td>
<td>81</td>
<td>14175</td>
<td>51407</td>
<td>1285235</td>
<td>10</td>
<td>549668</td>
</tr>
<tr>
<td>Market Share</td>
<td>9.34</td>
<td>76.87</td>
<td>59.30</td>
<td>65.37</td>
<td>72.92</td>
<td>25.60</td>
<td>77.26</td>
<td>72.07</td>
</tr>
<tr>
<td>1 a State Bank Group</td>
<td>8</td>
<td>391032</td>
<td>69</td>
<td>1035</td>
<td>22097</td>
<td>493554</td>
<td>27</td>
<td>11592</td>
</tr>
<tr>
<td>Market Share</td>
<td>2.77</td>
<td>27.85</td>
<td>4.33</td>
<td>28.10</td>
<td>28.03</td>
<td>13.23</td>
<td>31.62</td>
<td>24.82</td>
</tr>
<tr>
<td>1 b Nationalised Banks</td>
<td>19</td>
<td>688361</td>
<td>12</td>
<td>13139</td>
<td>29310</td>
<td>791281</td>
<td>43</td>
<td>10838</td>
</tr>
<tr>
<td>Market Share</td>
<td>6.57</td>
<td>49.02</td>
<td>54.97</td>
<td>37.27</td>
<td>44.89</td>
<td>12.37</td>
<td>45.63</td>
<td>47.25</td>
</tr>
<tr>
<td>Indian Pvt. Sector Banks</td>
<td>30</td>
<td>207173</td>
<td>57</td>
<td>2621</td>
<td>15974</td>
<td>297279</td>
<td>31</td>
<td>42139</td>
</tr>
<tr>
<td>Market Share</td>
<td>10.38</td>
<td>14.75</td>
<td>12.22</td>
<td>20.31</td>
<td>16.87</td>
<td>48.10</td>
<td>15.20</td>
<td>18.23</td>
</tr>
<tr>
<td>2 a Old Pvt. Sector Banks</td>
<td>21</td>
<td>91431</td>
<td>26</td>
<td>648.77</td>
<td>5646.38</td>
<td>105109</td>
<td>50</td>
<td>2385</td>
</tr>
<tr>
<td>Market Share</td>
<td>7.27</td>
<td>6.5</td>
<td>2.71</td>
<td>7.18</td>
<td>5.96</td>
<td>2.72</td>
<td>5.66</td>
<td>5.51</td>
</tr>
<tr>
<td>2 b New Pvt. Sector Banks</td>
<td>9</td>
<td>115742</td>
<td>31</td>
<td>2272.29</td>
<td>10328.02</td>
<td>192169</td>
<td>81</td>
<td>39754</td>
</tr>
<tr>
<td>Foreign Banks in India</td>
<td>36</td>
<td>69312</td>
<td>82</td>
<td>4497</td>
<td>8908.28</td>
<td>116401</td>
<td>08</td>
<td>22904</td>
</tr>
<tr>
<td>Market Share</td>
<td>12.46</td>
<td>4.94</td>
<td>18.82</td>
<td>11.32</td>
<td>6.60</td>
<td>26.14</td>
<td>5.78</td>
<td>6.84</td>
</tr>
<tr>
<td>Total Pvt. Sec Banks (3+2)</td>
<td>66</td>
<td>276486</td>
<td>39</td>
<td>7418.85</td>
<td>24880.68</td>
<td>413680</td>
<td>39</td>
<td>65044</td>
</tr>
<tr>
<td>Market Share</td>
<td>22.84</td>
<td>19.69</td>
<td>31.04</td>
<td>31.64</td>
<td>23.47</td>
<td>74.25</td>
<td>20.97</td>
<td>25.07</td>
</tr>
<tr>
<td>Total Comm. Banks (1+4)</td>
<td>93</td>
<td>1355880</td>
<td>2</td>
<td>21594</td>
<td>21827</td>
<td>76287</td>
<td>84</td>
<td>1699816</td>
</tr>
<tr>
<td>Market Share</td>
<td>32.18</td>
<td>96.56</td>
<td>90.34</td>
<td>97.00</td>
<td>96.39</td>
<td>99.85</td>
<td>98.23</td>
<td>97.14</td>
</tr>
<tr>
<td>Regional Rural Banks</td>
<td>196</td>
<td>48338</td>
<td>00</td>
<td>2308.59</td>
<td>23574.41</td>
<td>63614</td>
<td>00</td>
<td>131.00</td>
</tr>
<tr>
<td>Market Share</td>
<td>67.82</td>
<td>3.44</td>
<td>9.66</td>
<td>3.00</td>
<td>3.61</td>
<td>0.15</td>
<td>1.77</td>
<td>2.86</td>
</tr>
<tr>
<td>Total of all Banks</td>
<td>289</td>
<td>1404218</td>
<td>20</td>
<td>23902.83</td>
<td>78645.25</td>
<td>1762530</td>
<td>29</td>
<td>87608</td>
</tr>
<tr>
<td>Market Share</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: www.indianbanksassociation.org/home/visionreport03.asp
absorptive capacity (Cohen et al., 1990) or organizational learning (Attewell, 1992), to build theoretical frameworks that fit these complex scenarios.

A research model that supposes that people’s innovative behaviour undergoes change over time depending on interactions among the persons, the technology, and the organization, should capture longitudinal data on all three dimensions (Gallivan, 2001; Orikowski and Robey, 1991).

Kamal (2006) identified a set of factors that have been found to be of an influence at two levels of the organization i.e. the adoption of innovation at the organizational level and the acceptance and impact of IT innovation on the individual adopter level within the organization. By incorporating all the relevant factors he proposed a conceptual model that may be employed as a decision making tool for IT innovation adoption in government sector organizations and is of interest for this study is depicted in figure 3.

Kamal’s (2006) model and Poku’s (2004) model form the base models on which the model for this study has been developed.
Figure 3. Kamal’s Proposed Model for IT innovation adoption in the Government Sector