CHAPTER – II
CONCEPT & RESEARCH METHODOLOGY

2.1 Introduction

Liberalization and financial sector reforms during the last one decade have brought the issue of productivity and profitability of banks into the limelight. Profitability of banks has been under strain on account of declining net interest margin and increasing competition. The comfortable business of accepting deposits and lending at administered rates has been dented following deregulation of interest rates and increase in competition after the entry of private and foreign banks. In the changing context, banks with a high degree of cost effectiveness, increased efficiency and customer centric approach would survive. Use of modern risk management practices, exploring ways to increase non-fund based income, analysis and control over expenses and greater use of information technology have become imperative to protect their bottom-lines in the deregulated environment. Liberalization also led to economic growth. It has created job opportunities in abundance for the non-technical, English speaking graduates in the areas like call centre, retail and direct marketing. It has also created opportunities for skilled professionals in the electronic media and Information Technology (IT) sector.

Indian banks have recorded a phenomenal growth in the past decade with initiation of economic reforms. The banks, both Public and Private, have transformed themselves into profit-oriented business organizations besides playing a developmental role in the economy. In an attempt to be more profitable, the banks have become competitive and more customers oriented. This new orientation has compelled them to take a more pragmatic approach for conducting the business. The Master Data Management is one such tool which helps
in meeting the customer’s expectations according to their changing needs.

Indian financial services industry is dominated by the banking sector that contributes significantly to the level of economic activity, as empirically demonstrated by Jadhav and Ajit (1996). The banking structure in India is broadly classified into public sector banks, private sector banks and foreign banks. The public sector banks continue to dominate the banking industry, in terms of lending and borrowing, and it has widely spread out branches which help greatly in pooling up of resources as well as in revenue generation for credit creation. The role of banks in accelerating economic development of the country has been increasingly recognized since the nationalization of fourteen major commercial banks in 1969 and six more in 1980. This facilitated the rapid expansion of banking in terms of its geographical reach covering rural India, in turn leading to significant growth in deposits and advances. Eventually, however, the government used banking sector to finance its own deficit by frequently increasing cash reserve ratios (CRR) and statutory liquidity ratio (SLR). This, in turn, affected the resource position of commercial banks adversely, restricting their lending and thereby the ability to generate profits.

An efficient banking system is necessary for the overall growth of an economy and in the case of a developing economy it becomes rather much more important. Only an efficient banking system can contribute towards the formation of capital and implementation of monetary policy of a country. Banking system serves as an important channel to accomplish higher economic development by mobilizing the small savings of the people from household sector and diverting them to the productive uses in industrial sector (Rajan and Zingales, 1998). Efficient banking system of a country also makes a contribution
towards the societal welfare by providing financial services at an economical cost to its citizens (Valverde et al., 2003).

Deregulation of the Indian financial system in 1991 followed by various financial sector reforms during the period 1990 through 1998 led to a major restructuring of the Indian banking industry\(^1\). This includes reductions in the CRR and SLR which were as high as 15% and 38.5% respectively in 1991, and preempted 53.5% of incremental deposits. These rates were reduced in a series of steps. By 2005, the SLR got dropped to 25% and CRR to 4.5% of total deposits. The reforms were however, more comprehensive and led to sharp changes in various parameters of banking system. Further, on the basis of the recommendations of the Steering Committee set up by RBI, ‘Ownership and Governance’ and the implementation of the ‘New Capital Adequacy Framework’ were formulated and issued to banks on February 15, 2005. As a result, the restrictions on geographical expansion and ceiling on interest rates were removed. With increased competition, declining margins on current business operations, higher costs and greater risks, banking industry in general, had to face a two pronged challenge. They had on the one hand, to enhance their productivity and on the other, increase their ability to serve the nation in new ways with greater efficiency and effectiveness.

In such a scenario, banking industry had to sustain itself by increased reliance on cost minimization and by ensuring greater efficiency. Indian scheduled commercial banks in general, and the nationalized banks in particular, have had to spearhead the growth in banking business as they account for an overwhelming share of Rs.13,60,724 Crs’ as total deposits and Rs 957697 Crs’ as advances as on March, 2007. These reforms were broadly aimed to improve the

\(^1\) The reforms were based on the recommendations of the Committee on Financial Systems (CFS) (Narasimham 1991) first, followed by those of Committee on Banking Sector Reforms (BSR) (Narasimham 1998) in a phased manner.
performance of banks despite the unexpected global recession and internal disturbances. At this juncture banking sector is immensely competitive and growing in the right trend (Ram Mohan, 2008). With this in view it becomes necessary to ask whether the performance has improved? In what way and how much? The present study is thus focused on the following objectives:

- To review, problems related to the measurement of inputs and outputs.
- To measure productivity growth in Indian scheduled commercial banks (excluding Regional Rural Banks (RRB)) wherein, we identify productivity performance along with technical efficiency.
- To undertake a comparison of efficiency gains across different groups of banks.

2.2 Concepts

The traditional banking that was being practiced has become obsolete in the wake of computerization of the banking industry. The old banking concepts like limited hours of banking has changed to any time banking. The banking has become customer centric. Newer products have been introduced in banking. Traditionally banks were not financing for the purchase of housing while today the banks are encouraging to buy house property by obtaining housing loan facility from the banks. Debtors financing was considered as a low profile. To day the approach is changed. For housing, vehicle loans banks are marketing their products by deputing their staff to the prospective customers. To day any time and any where banking facility is available. Earlier there use to be clumsy procedure for sending the outstation cheques for clearance which used to take unreasonable time. Today, one can remit funds for credit to outstation customer’s bank account without any charges and the funds are available to the customer the same day. Now Demand Drafts and Mail Transfer
transaction have become history of the past. By putting one single entry rest of the subsequent operations are automatically performed and hence no subsidiary books writing, no interest calculation and application and balancing work which was being attended manually in the past. Now these works are simultaneously carried out by the computer system. Now in the modern age of banking the customer has been permitted to have limited access to his bank account from his home/office by the use of internet banking facility. This is not the comprehensive view of the change in the concepts but illustrative view. These changes in the concepts have face lifted the banks approach to the business of banking.

2.3 Statement of the Problem

Subsequent to the adoption of banking sector reforms from 1991, there is face lift of the Indian banks. The adoption of technology development by the Indian banking sector has been responsible for the face lift. As a consequence of the reforms, there is competition from the foreign banks that have come in good number. These banks were already using the information technology in their operations. And hence to compete with these banks naturally their Indian counter parts had also to embark upon the massive dose of technology upgradation. This involved sizable outlay of capital inflow for which the government supported the public sector banks. The banks also whole heartedly welcomed this move and extended extensive training to the staff at all levels and ensured that the staff is system friendly for efficient working.

In this process of adoption of the new technology the entire banking scenario has undergone a sea change. Banking industry had to resort to business process re-engineering. This introduction of new systems and procedures enabled the management of banks to use the staff potential optimally. This has naturally positively affected the
efficiency of the staff. The entire composition of the banking industry’s profitability has changed and assumed new dimensions.

It is on this background the researcher has been posed with the problem to assess the impact of the information technology on the efficiency of the banking industry. As the Indian banking sector comprises of different types of banking institutions like a) public sector, b) Private sector – old and new generation, c) Large sized cooperative banks etc., the degree of use of information technology in these various types of banks was different, therefore, the researcher has decided to study the problem in all these types of institutions.

2.4 Objectives of the Study

While selecting the subject various alternatives were broadly seen. It was observed that in the current context there were few studies available on impact of IT on the productivity and efficiency of the banking industry, particularly after the Indian banks heavily invested in technology up-gradation and use of IT.

In the changed perspective as a result of globalization to day it is very essential that all the related technologists as well as social Banks will have to join hands in taking up the efficiency of the banks a to newer heights. The present study has been undertaken to achieve the following broad objectives:

i) To study the types of IT application in Banking Sector.

ii) To study the impact of IT application on Customer services in various categories of banks.

iii) To study the impact of IT application on employees satisfaction of various categories of banks.

iv) To study the Impact of IT on efficiency of the banking sector

v) To suggest remedies if any.
2.5 Hypotheses

Use of information technology in banking sector is the function of several parameters. Even though all the direct and indirect costs of introduction of information technology are considered the use of IT proves economically beneficial to all stakeholders, i.e. shareholders, staff, customers and the society at large.

- **H1**: “More the satisfaction of banks staff about training imparted of IT, more is the Customer satisfaction about services of banks”

- **H2**: “The customer’s period of association with the bank and the customer’s satisfaction about the banks services are interrelated.”

- **H3**: “More the satisfaction of banks staff about training imparted of IT, more is the overall efficiency of the banks perceived by staff.”

- **H4**: “There is variability in profitability of the selected banks during study period.”

- **H5**: “There is difference in the efficiency of banks from various categories.”

2.6 Significance of the Subject

Technology Driven Indian Banking

The two letters which has changed the way businesses operate has been IT as an acronym for Information Technology. No other facilitating service has resulted in such large scale benefits as Information Technology. IT has become such an essential ingredient of one’s way of life in today’s world that it is difficult to imagine a world
without IT. And no other sector has benefited to such a large extent as
the financial sector, with the Banking sector in particular, from the
inroads made by IT. The Banking sector is no exception to this
changing scenario which is sweeping across the world Technology has
given birth to a new era in banking. Technology can be the key
differentiator between two banks and a major factor to attain
competitive edge. Though slow in the beginning, Indian banks seem to
have paced up in adoption of advanced technology, as is evident from
our survey results. Technological systems of Indian banks have rated
more advanced than China and Russia; at par with Japan, but less
advanced than Singapore, UK and USA.

Most of the banks have already started to feel the impact of the
operations of the new banks in the country. The single biggest
advantage of these banks is the large scale deployment of IT in their
business endeavours. Their business processes have necessitated that
IT should provide solutions to various bottlenecks and problems and
the result has been that IT has transcended well as an integral part of
their regular operations.

In the case of the older banks, however, it is paradoxical to note
that even now IT drives the way the organization functions and not
vice versa. The changes staring at the face of bankers all relate to the
fundamental way of banking--which is undergoing a rapid
transformation in the world of today. It is widely recognized that the
core banking functions alone do not add to the bottom line of banks--
value added services are slowly but steadily emerging as a substantial
opportunity for banks to exploit and customers would not hesitate to
use such services in view of the convenience they offer. Prime factors
necessitating these changes relate to the forces of competition,
productivity and efficiency of operations, reduced operating margins
and the need for better asset--liability management.
One of the major challenges faced by banks is the impact of competition and the falling margins in the transactions undertaken by them. With wafer thin profit margins being the order of the day, the solution to this would lie in increasing volumes well beyond a critical mass so as to result in better operating results for banks. Technology which facilitates handling increased volumes at higher levels of efficiency. It is in this context that there is an imperative need for not mere technology upgradation but also integration of technology with the general way of functioning of banks. It is well recognized that technology holds the key to the future success of Indian Banks since it is Information technology which has brought in a sea change in the way banking is being conducted today—which is but an indication of the morrow. It would be beyond anybody's imagination to even think about conducting banking business anywhere in the country or using a powerful yet simple medium such as the Internet even from roadside kiosks. But today this is the reality—which owes its credit to the rampant exploit of IT by banks. And concepts such as 'Anywhere Banking' or 'Automated Teller Machines' are but offshoots of technology implementation by banks, as also Internet Banking and Mobile Banking. Such innovations have had a positive impact on customer service—but the fundamental benefit that is derived by banks relates to reduced costs of operation—such as in handling cash and in servicing customers efficiently and accurately over the counters of branches. The large scale proliferation of IT in the Banking sector has also brought into focus many challenges which have to be overcome by us. A major attitudinal change which is required is the need for a change in the concept relating to treatment of customers of banks—with the collapse of geographical distances, banks need to treat the customer as a customer of the whole bank and not as a customer of any particular branch. This is now possible thanks to the usage of IT in a large scale whereby centralized data bases are possible in a bank with decentralized access. Another option to achieve this is objective is to have clustered solutions in a bank with
data of customers residing in these systems. Banks need to constantly look for innovative services which offer customers the convenience of transacting from anywhere, at any time and using delivery channels more suitable for them. These are frontiers which would add value to the services offered to customers and at the same time act as a means for increasing the profits for banks too. One of the most significant areas where IT has had a positive impact is on substitutes for traditional funds movement services. With the advent of electronic banking, electronic funds transfer and other similar products, funds transfers across different constituents is now easily possible--within time frames which would have appeared impossible a few years ago. It is this area which is a big challenge to banks. Many new players are entering into the arena of funds transfer services and the pride of place enjoyed by bankers is under severe threat. The competition is not just from organizations performing funds transfer services but from other seemingly unrelated channels such as service providers for message transfer, quick delivery of instruments and the like who all facilitate the movement of funds based messages at speeds faster than before. The lines between corporate communication carriers and banks are now blurred so that doubts arise where one ends and another begins. Information Technology (IT) innovations in the last few years have changed the landscape of banks in India. Today, IT seems to be the prime mover of all banking transactions. Electronic and Information Technology together are bringing a swift change in the way banks operate, especially offering better delivery channels and customers' friendly services. Anywhere banking, telebanking, mobile banking, net banking, automated teller machine (ATMs), credit cards, debit cards, smart cards, call centres, CRM, data warehousing have totally transformed the banking industry.

Today almost all the major banks in India like ICICI Bank, UTI Bank, Citibank, Standard Chartered Bank, ABN Amro, SBI and PNB are offering online services to their customers. ATMs have emerged as
the most favoured channel for offering banking services to the customers in the world.

In India, currently, there are two types of customers--one who is a multi-channel user and the other who still relies on the branch as the main channel. The primary challenge for banks is to provide consistent service to customers irrespective of the kind of channel they use. The channels broadly cover the primary channels of branch (i.e. teller and ATM), phone (i.e. call centre, interactive voice response unit), and internet channel (i.e. personal computer, browser, wireless) banking. Banks in India have all set for transformed branches, enhanced telephone services, and internet banking functions. Even for PSBs, the ongoing and future investments are massive.

Financial reforms had its impact on Indian banks and financial institutions. In the fast changing financial environment, fierce competition and changes in the regulatory policies created uncertainty and risk for the Indian banking industry. Realizing this fact, academicians and practitioners highlighted in their studies that information source in banks is of capital importance and they look at information technology as strategic response to changing financial environment/challenges (Ammayya 1996).

The Rangarajan Committee Report (1989) was the first path breaking step in this direction, which highlighted that computerization must be looked upon as a means to improve customer service and efficiency and that the banks’ workforce should realize that mechanization would lead to growth and employment expansion (Bide 1997). Subsequently, Narasimham Committee (1992), while highlighting the problems faced by Indian public sector banks, and, as an antidote to the identified lacunae, also stressed the need for greater measure of computerization in banks. The committee observed that modern banking involves a great deal of processing of
mass of information and commitment to technology is the only solution that ensures timeliness, accuracy and resultant improved performance and enhanced customer service.

2.7 Research Methodology

The broad universe for the purpose of this study comprises of Public Sector Banks, Private Sector Banks (both old generation and new generation) and the large sized and small sized urban Cooperative banks operating in the Pune District. The precise universe for this study includes the identified branches of the categories of banks already stated, their employees and the customers to be identified.

The sampling procedure followed for this purpose has been dealt in greater details at point No. 2.5.3

2.8 Techniques Used

❖ Primary Data

Cross section methodology has been used by the researcher for assessing the implication of use of information technology and automation for increasing the productivity and employment in the Indian banking sector. The primary data has also been obtained from a few staff members of all the categories of the banks under study, so also a few customers of the banks representing a cross section of depositors, borrowers have also been obtained to ascertain their perception of efficiency upon introduction of information technology in banking.

❖ Secondary Data

This research is mainly based on the secondary data, mostly published data by these identified banks. Every year the banks publish their Annual Reports providing audited financial statements as well as briefing the banks achievements and plans for the future.
Since the performance is depicted from the financial statements which was the basis of this study. Wherever, abnormalities were observed those were got clarified by interacting with the concerned bank’s senior executives.

The secondary data and information relating to the study has been collected from both published and unpublished material.

✐ Sources of Secondary Data

The information and data has been collected from various sources such as:
- Books,
- District Statistical Handbook,
- Bank’s websites,
- Annual Reports,
- Journals,
- Newspapers,
- Articles,
- Periodicals etc.
- Web sites

✐ Questionnaire

To obtain primary data from the selected banks (staff, as well as customers) a well-designed questionnaire has been used. Before the same was adopted it was tested to check the response for it.

✐ Interview

The primary data has also been obtained by interacting with the senior level executives of the identified banks. Where the data collected required some additional information which was not available through the Annual Reports interaction with the Senior Banks officials of the identified banks was made and required clarifications were obtained.
Sampling Procedure & Sample Size

Since the research subject is related to analysis of efficiency in banking industry it was necessary to define the concept of efficiency. Efficiency has too wide coverage and considering the degree of introduction of information technology, the following sample selection process has been followed:

Criteria for Selection

Table No. 2.1 showing All India Level Different Categories of Banks as on 31.3.2012.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the category</th>
<th>No. of Banks</th>
<th>No. of banks selected</th>
<th>% of banks selected to the total number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Public Sector Banks</td>
<td>19</td>
<td>2</td>
<td>10.52</td>
</tr>
<tr>
<td>2</td>
<td>Private Sector Banks (Old Generation)</td>
<td>14</td>
<td>2</td>
<td>14.28</td>
</tr>
<tr>
<td>3</td>
<td>Private Sector Banks (New Generation)</td>
<td>07</td>
<td>2</td>
<td>28.57</td>
</tr>
<tr>
<td>4</td>
<td>Large Sized Urban Coop. Banks.</td>
<td>39*</td>
<td>2</td>
<td>10.52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>79</strong></td>
<td><strong>8</strong></td>
<td><strong>10.12</strong></td>
</tr>
</tbody>
</table>

* Only member banks of Indian Banks’ Association

Out of 79 Banks, 8 banks have been selected for this research which accounts for 10.12% of the total major banks.

While selecting the banks as well as the staff and the customers for this study random sampling method has been used.

Further the banks have been randomly identified on the basis of their deposits as on the 31st March 2012. The selection process was as under:
Table No. 2.2: Table showing how the selection of the banks has been made. (Rs. In Crores)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Total deposits of PSUBs as on 31.3.2012</th>
<th>% to total deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Public Sector Banks</td>
<td>3386496.76</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Identified Banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bank of Maharashtra</td>
<td>76528.65</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bank of India</td>
<td>318216.03</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Total of identified banks deposits</td>
<td>394744.68</td>
<td>11.65</td>
</tr>
<tr>
<td>6</td>
<td>Private Sector Banks Old generation</td>
<td>315891.37</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Identified Banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The Federal Bank Ltd.</td>
<td>48937.12</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The Ratnakar Bank Ltd.</td>
<td>4739.33</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Total of identified banks deposits</td>
<td>53676.45</td>
<td>16.99</td>
</tr>
<tr>
<td>11</td>
<td>Private Sector Banks New generation</td>
<td>858696.04</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Identified Banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>HDFC Bank Ltd.</td>
<td>246706.45</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>ICICI Bank Ltd.</td>
<td>255499.96</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Total of identified banks deposits</td>
<td>502206.41</td>
<td>58.48</td>
</tr>
<tr>
<td>16</td>
<td>Urban Coop. Banks in Pune Dist.</td>
<td>28655.06</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Identified Banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Cosmos Coop. Bank. Pune</td>
<td>12059.68</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Janseva Coop. Bank Ltd. Pune</td>
<td>1103.99</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Total of identified banks deposits</td>
<td>13163.67</td>
<td>45.93</td>
</tr>
</tbody>
</table>

The average of the sample for the four categories identified for this study works out to 33.26%

Source: Annual Reports of identified banks

So far as Urban Coop. Banks’ are concerned, the reference has been made to the statistical data presented by the Pune District Urban Coop. Banks Association, Pune. Even if we consider all India position these two identified banks under urban coop. banks are considered to be banks of good size. And the average of the four categories banks’ deposit percentage works out to be 33.26% which can well be considered as a fair and representative sample.

So far as the research topic is concerned for studying the data relating to the impact of the Information Technology on the efficiency of Indian banking sector one has to study it on the basis of the data
available from the corporate office of the concerned banks. Hence the study is based on the secondary data available from the published Annual Reports of the respective identified banks for the study period. However, to have the ground level perception of the use of information technology and its impact on profitability the researcher has also randomly identified bank staff as well as the cross section of the banks customers and administered a well designed questionnaire and collected the data.

However, in order to have the first hand grass root level perception of the use of the information technology by the bank employees and their cross section of customers is also considered to be a vital aspect. Hence the researcher has collected and studied primary data collected through the administration of the well developed questionnaire for the staff as well as the cross section of the customers. The cross section customers include depositors, borrowers as well as those who avail of various other services of the banks like remittances etc. For this purpose the sample has been drawn as under:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Bank</th>
<th>Branches Selected</th>
<th>Staff Selected</th>
<th>Customers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bank of Maharashtra</td>
<td>Model Colony</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Navi Peth</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Bank of India</td>
<td>F. C. Road</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tilak Road</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Federal Bank</td>
<td>Ghole Road</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kothrud</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Ratnakar Bank Ltd.</td>
<td>Nana peth Br.</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sinhgad Road</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>HDFC Bank Ltd.</td>
<td>Aundh</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F. C. Road</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>ICICI Bank Ltd.</td>
<td>Ghole Road</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bhandarkar Road Br.</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Cosmos Coop. Bank</td>
<td>Gokhalenagar Branch</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laxmi Road Br.</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Janseva Coop. Bank Ltd.</td>
<td>Aundh</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Erandavana Branch</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>80</strong></td>
<td><strong>80</strong></td>
<td><strong>160</strong></td>
</tr>
</tbody>
</table>
While selecting the number of respondents the researcher has in mind that the overall efficiency is being studied from the corporate data available and just for ascertaining the grass root level perception of the advantages of the information technology this primary data has been collected. This data has been analyzed only with the limited purpose and hence the sample size has been restricted to 160. So far as the main theme of the researcher problem, the sample size selected on the basis of the deposits position of the categorized banks the sample size is quite representative.

While selecting the branches the research has taken care to see that one bank is from residential location and the other one is from business location. While selecting the staff, the researcher has ensured that the staff from officer cadre as well as clerical cadre is included. The researcher has also given due importance for inclusion of the fair sex to have broader data collection.

Although the relevant data for the study is accounted at H.O. level, in order to ascertain the impact of the introduction of technology on the branch working particularly the staff efficiency the researcher has collected the primary data from the identified banks branches located at Pune. This data is collected from the staff of all cadre as well as the customers of the respective branches.

**Data Analysis**

The collected primary data was analyzed using various statistical techniques such as ‘T’ test, ‘Chi-square test” “ One way Anova”, “Cronbach’s Alpha”, and personal interview administering pre-designed questionnaires, interaction with bank staff, customers from various categories, general observations etc.

Mostly tabular analysis was done to find out the impact of information technology on the productivity and efficiency of the bank
branches. Further percentage of various types as well as various types of graphs have been taken and used for comparison.

For hypothesis testing and statistical analysis researcher has used SPSS 16.0 (statistical package for social sciences) software.

- **Statistical Tools for Data Analysis**
  
  The following statistical tools have been used:-
  
  - **Percentage**- This is a special kind of ratio which will be used to compare variables. Percentages will be used to condense data and express in relation to 100.
  
  - **Frequency**- This technique is used for giving the meaning and compare between the variables.
  
  - **Correlation**- This tool will be used to know the relationship between the variables. That is the effect of change in one variable on another variable. There are two types of correlation coefficients as Pearson correlation and spearman’s rank correlation. Researcher has used both the Pearson correlation coefficient and spearman’s rank correlation coefficient.
  
  - **T-test**- This tool was used for the comparison between the two variables in the basis of the arithmetic mean.
  
  - **One Way Anova**- This is the statistical technique to look into the differences in more number of groups of the respondents on the basis of the arithmetic mean.
  
  - **Chi-Square Test**- This test is used for the knowing the association between the variables specifically with the nominal data variables.
- **Diagrams and Graphs** - The diagrams and graphs will be used as an aid in interpretation of data and drawing conclusions.

- **Averages** - This statistical method is often necessary to represent a set of data in terms of one single number that should neither represent the lower nor the highest value but a value in between the highest and the lowest value.

In addition to the above tools the researcher has used one more statistical test and that is Cronbach’s Alpha reliability test. A brief note on this test is appended here below:

**Cronbach's Alpha Reliability Test**

**Pilot Study**

Researcher has administered different data collection instruments for the customers of the respective banks and bank staff. Pilot study has been conducted to explore the reliability of the questionnaires.

**Questionnaire Administered for the Customers**

Researcher wanted to check the reliability of the data collection instrument. Researcher has prepared the questionnaire with 31 variables wherein the reliability needed to be observed. Researcher has applied Cronbach’s Alpha reliability test.

**Reliability**

<table>
<thead>
<tr>
<th>Case Processing Summary</th>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td><strong>%</strong></td>
</tr>
<tr>
<td>Cases Valid</td>
<td>30</td>
</tr>
<tr>
<td>Excluded</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>
It was observed that Cronbach’s Alpha is 0.709 which is statistically significant and acceptable. Researcher can conclude that the same questionnaire can be administered for the further study.

**Questionnaire Administered for the Bank Staff**

Researcher wanted to check the reliability of the data collection instrument. Researcher has prepared the questionnaire with 31 variables wherein the reliability needed to be observed. Researcher has applied Cronbach’s Alpha reliability test.

<table>
<thead>
<tr>
<th>Reliability Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s Alpha</td>
</tr>
<tr>
<td>N of Items</td>
</tr>
<tr>
<td>0.863</td>
</tr>
</tbody>
</table>

It was observed that Cronbach’s Alpha is 0.863 which is statistically significant and acceptable. Researcher can conclude that the same questionnaire can be administered for the further study.

### 2.9 Scope of Study

An attempt has been made to sample out representative banks belonging to various categories such as Public Sector banks, private sector banks, New Generation Private Sector banks and large and medium and small sized Urban Cooperative banks operating in Pune Metropolitan city.

### 2.10 Limitations of the Study

There are different types of banks on the Indian banking horizon. The degree of introduction of the information technology is also varying. The cooperative banks cannot withstand in competition
with that of the new generation private sector banks. These private sector banks can spend heavily on information technology. So also the banks are using different hardware, software as well as equipment like ATM machines of various brands etc. The products as well as services of various banks also vary. Therefore, in a way the level playing field cannot be said to be equal.

Usually the banks are reluctant to pass on the data under the guise of confidentiality. Concerted efforts have been made to obtain maximum possible data from the banks under study. The researcher is stationed at Pune and the accounting of the cost of introduction of the information technology is usually at the Head Offices of the bank which are spread over a large area. Hence, visiting the head office for interaction with the concerned authorities was not possible. All this has turned out to be a limitation.

2.11 Chapter Scheme of the Study

The present study has been divided into six chapters:

**Chapter I - Introduction**

It deals with the introduction of banking, evolution of Indian banking, structure of banking in India, various stages of evolution like: social control over banks, nationalization of banks in two stages, Introduction of Lead bank scheme, Banking Sector reforms State I and Stage II and the incoming State III, introduction of Information Technology in banking sector, its impact on the productivity and efficiency in the banking sector, problems and challenges faced by the information technology etc.

**Chapter II - Concepts and Research Methodology**

It covers methodology adopted for the study which covers, significance of the study, objective of the study, hypotheses, data collection – primary and secondary, analysis and interpretation of the data, limitation of the study and the chapter scheme.
Chapter III - Review of Literature
Covers review of related literature at international level and at national level with focus on impact of IT in the banking sector on its productivity and efficiency.

Chapter IV - Profile of Banks under Study
It comprises of profile of Pune Metropolitan city as well as brief highlights of the identified 2 banks from each category making it a total of 10 banks.

Chapter V - Analysis and Interpretation of Data
It deals with analysis and information gathered through the financial statements its study and interpretation using various statistical tools.

Chapter VI - Presentation of Primary Data with its Analysis
It deals with analysis and information received during the course of field study and its interpretation using various statistical tools.

Chapter VII - Observations, Suggestions & Conclusion
It covers the observations made by the researcher and his suggestions, conclusion.