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Theoretical Background, Conceptual Framework and Research Design
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Theoretical Background and Conceptual Framework of the Study

3.1 Introduction

This chapter explains about the theoretical background of the present study. This section gives the significance of ICT in the Banking Industry and acceptability and adaptability of the new technology by both customers and employees of Banks. Technology innovation and economic development are positively correlated. Invention of technology has become popular and useful for financial services. Old fashioned Banks have now jumped into the platform of modern technological environment. Before introducing ICT in the banking sector, ledgers were being maintained, brick and mortar system was accepted and each transaction was both time and energy consuming, but now with the advent of technology in this sector the work has been speeded up and a single card swiping in the machine can shower money.

3.2 Theoretical Background of the Study

Anywhere and anytime Banking has become a feature of the modern financial system. Electronic funds transfers and E- Banking services have made globe into a small village and have eliminated the geographical constraints. Technology is identified as an important factor by many economists. Since decades, in this background this section reviews various theories related to the present study. Innovation Diffusion Theory was developed by Roger in 1983. This theory investigates the characteristics of technology adopters who accept innovative technology. This theory is based on five important factors such as

- **Relative advantage**: Observing the comparative advantage over new technology with available technology
- **Triability**: Before adopting new technology in routine life just taking trial and error
- **Observability**: Clearly observing technology's outputs and its gains
- **Complexity**: Understanding its ease of use
- **Compatibility**: Accepting new technology without problems or conflict
Researchers namely Tan and Teo (2000), Gerrard and Cunningham (2003) and Md Nor and Pearson (2008) have tested this theory on E-Banking services. In this background the present research study also tests the reasons for opting E-Payments and E-Banking service by both customers and employees in the study area. The present study has taken the following factors such as

Chart. No -3.1 Reasons for Accepting Technology Based Services by Employees

(Self created chart)
The study has listed above factors and asked respondents to answer the reasons for accepting or adopting new technology in Banking transactions.

Adam Smith, Father of economics in his ‘Wealth of Nations’ had discussed about the division of labour and varieties of machines and opined that inventions of machines encourage labour force to produce more output with good productivity. John Schumpeter (1883 – 1950) in his theory of innovation, stated that anything stagnated in the state does not yield any profit, but when innovation takes place it disturbs steady state and brings profit.
Innovation economists opined that a key driver of economic growth in today’s knowledge based economy is not Capital but it is Technology. According to them technological spill overs create a competitive environment. They also found the inter - linkage between innovation and market growth.

Schumpeter in his book *Theory of Economic Development* which was published in 1912 wrote that any economy to be on the path of economic development needs healthy and well developed Banking sector. Set of Innovations or Research and development activities pave the way for technological development and create a new product for organization. Eventually, it leads to long term growth in the economy. Robert Solow (1950) formulated a theory of economic growth and stressed the importance of
technology. He stated that a tremendous increase in gross output per hour of work in the USA economy between 1909 and 1949 was the outcome of technological advancement. He also examined that increased use of capital assured 12.5 percent in per capita output and it left 87.5 percent residual that was attributed by technology development.

During the initial revolution (1750 – 1850) undoubtedly people saw improvements in their lifestyle and growth of the economy. Wealth increased in the economy of England but it led to the concentration of wealth in a few hands. The poor became much poorer and rich dominated the economy. This situation led to the birth of utopian socialism. It became prominent in the beginning of the 19th century. Saint Simon, Charles Fourier, Robert Own and others gave importance to equal distribution of wealth and income. Robert Own (1771 – 1850) contributed greatly to the utopian socialism and he advocated the establishment of ‘Villages of Cooperation’. He promoted cooperative community model and encouraged only a fixed rate of interest.

R. C. Dutt (1849 – 1909) in his books economic history of India and famines of India (two volumes) stated that the poverty in India was the outcome of unsound and ineffective financial institutions. Peasants and Artisans were not able to face high competition from British products due to lack of Capital. Sidney Webb (1859 – 1947) was in favour of Consumers’ Cooperatives. He encouraged cooperative societies for consumer groups for mutual help and voluntary work. He also stated that producers cooperative had become a puppet in the hands of capitalism. They were acting as per the instructions of the Capitalists. Therefore, he emphasized on setting up of consumers’ cooperatives.

Mahatma Gandhi (1869 – 1948) stressed village welfare and was in favour of self-sufficient and self-reliant villages. He dreamt about prosperous villages. According to him “Real India Was to be Found in Villages and not in Towns and Cities” So he inspired the villagers to organize cooperative groups for mutual financial help. He also advocated desi products and sale of Svadeshi items in the domestic market with cooperative societies. Rognar Nurkse (1952) explained the causes of the vicious circle of poverty. According to his study.
Low savings
Low Income
Low Production

They were the causes of deep rooted poverty. The above factors led to poor performance of the economy. Therefore, he advocated credit facilities at lower rate of interest. In that way it would help poor to come out of the vicious circle of poverty. Gunnar Myrdal (1957) in his ‘Economic Theory and under developed Regions’, Explained spread effect, backwash effect and Increasing inequalities in underdeveloped countries. According to him circular and cumulative process, i.e. a vicious circle of poverty leads to inequality. Production, Banking, Extravagant shopping and other activities in a free economy lead to unequal distribution. Herrod (1957) in his growth model stated that low savings and chronic inflation are the main features of UDCs, Expansion of Bank credit through the best financial institutional setup enables the economy to stimulate growth process.

Prof, Mohammed Yunus (1975) a Noble Laureate advocated the group based credit approach to reduce poverty in the economy. He had developed the ‘Grameena Bank model’ to ensure timely credit facilities to needy people. He became successful in his attempt. It was recognized all over the world and the he was awarded very prestigious award i.e. Noble Award.Corrigan (1982) argued that Banks have special role in the economy and have provided variety of transactional services.

Banks Administer payment system in the Nations
They provide liquidity backup to the economy
They are transmitters of monetary policy

The Banking sector has greatly changed the lifestyle of people and also banking transaction business has witnessed many changes. The banking sector is considered to be the nervous system of any economy.

Technology Acceptance Model was coined by Davis in 1989. This theory is one of the best theories of this modern era. This theory explains how a person accepts technology when it is introduced in his working environment or when it is to be opted by him. It explains about the attitude, perception and intention to make use of that advanced
technology. It can be easily explained with the help of the following chart when people are offered with a new technology. Many such factors influence them to decide about

- How to use new technology
- When to use new technology.

**Chart. No -3.5 Technology Acceptance Model**

(Self created chart)

The first intention of accepting technology is that perceived usefulness that means using technology would enhance his or her job performance or increase his happiness”. The present study in this background is going to study the perception of both customers and employees in accepting technology in the Banking organization. By accepting technology in working place employees would enhance their job performance and customers may get more utility.

The second intention of embracing advanced technology is to perceive ease of use meaning that the person believes that using a technology would be free from effort”. Usually people develop positive attitudes towards advanced technology due to belief and its propagation.

Davis Originally developed this model to test the acceptance of word-processor technology. Later on it has been extended to database management systems, email, voice mail, personal computers, telemedicine technology and so on.
The present study wants to analyse the perception of employees and customers. Following are the main features of the model. It was developed to give an adequate explanation about actual behavior, attitude and behavioral intention of people about IT-related services

- This model has a strong theoretical base and uses psychometric measurement scales
- It is based on strong empirical study
- Explains the behavior of end-user computing technologies.

The theory explains the person's attitude towards acceptance of technology and his perception pertaining to its usefulness. It also highlights that person believes that the new technology brings him pleasure only on that belief he starts to embrace it.

**Chart No. 3.6 Risk involved in E-Banking Services**

(Self created chart)

The technology adoption lifecycle model (2003) is an extension of the diffusion model of Joe M. Bohlen, and developed by Neal C. Gross and Bryce Ryan. They found that people easily do not want to face risks in their life. Therefore the present study is going to test whether customers and employees of selected commercial Banks and UCBs are risk lovers or risk averters. Innovators are more educated and risk lovers, rich and ready to take challenges in their life, early adopters are young generation highly educated, though they are less prosperous than the first group lead the community. The Early majority group consists of conservative minds people, but they are ready to accept new
ideas. The late majority group comprises old generation, less educated and highly conservative in their nature. Laggards are very conservative and least educated.

Griliche and Jogerson (1961 – 1973) with this formula $Y_t = F(K_t, I_t, t)$ stated that economic growth is function of capital, labour and technological progress. Here, technology is considered as one of the important factors of economic growth. Simon Kuznets (1966) opined that the technological developments in underdeveloped countries contributed to the progress in different sectors of the economy. Technology up gradation ensures research and development programmes, increases skilled labour force and introduces capable entrepreneurs. Akio Mortia, The chairman of Sony Corporation in 1992 opined that the introduction of technology alone is not a great achievement but the creativity and optimum use of this technology make a wider sense. Organisation with magical wand i.e. Technology can bring maximum benefits. Vernon (1993) in his product cycle hypothesis stated that underdeveloped countries to improve their economic conditions should import a package of technology from other well developed countries and these technology capabilities encourage them to enhance market size. The product cycle is based on the idea that the production process passes through several stages and technology development is one of the stages in the product cycle hypothesis. Endogenous growth theories also recommended the introduction and up gradation of technology in different sectors of the economy. They also supported the investment on human capital, knowledge and technology to reap maximum benefits.

Brynjolfsson and Hitt (2000) pointed out that ICT has a positive impact on the performance of any organizations. They proved in their study that ICT capital has a major share of 81% marginal increase in the output of an organization but capita which is not backed up by Information Technology contributes only 6%. in their study, they have also illustrated that employees who are provided ICT infrastructure are as productive twice more than as conventional professionals. The present study is going to analyse the performance, productivity and profitability of Banks with regard to ICT tools to test whether the banking sector in India is influenced by ICT adoption.
3.3 Conceptual Framework

ICT strategy in the Banking sector is recognised as an important step by the RBI. Because in India more than 65 percent of the total population is either under banked or unbanked. E-Banking services are a powerful tool to reach the doorsteps of unreached community to bring them to the mainstream of the economy and also to help them to access Banking services. No doubt that today’s banking business environment has become dynamic and has undergone rapid changes because of the introduction and upgradation of technological tools.

Concept of ICT

ICT is a combination of computer technology and telecommunication technology. 21st Century is directly controlled by multiple communication channels like verbal communication, writing, audio-visual and electronic media. Communication and technology are widely used in all aspects of life and increasingly applied to all the sectors of the economy.

ICT is a Combination of

Chart. No -3.7 Concept of ICT

(Self created chart)

ICT can be described as
Information -> Processed data
Communication -> Exchange of Information from one point to another, either electronically or Non-electronically.
Technology -> Specific scientific knowledge used in a practical way with advanced tools.

**Concept of Banking Technology**

ICT has sprinkled miraculous water on the economy. It is hatching golden eggs and boosting the economy to achieve double digit growth. ICT strategy by bringing transparency and increasing efficiency is helping the Banking sector to have a sound financial performance.

**Chart. No -3.8 E-Payment Services in Banks**

(Self created chart)

I. **Real Time Gross Settlement**

RTGS helps customers to transfer their funds from one Bank to another Bank. It is operated and managed by the Reserve Bank of India. With this E-Channel a Bank can transfer funds fast and reach the beneficiary within two hours. The only core banking solution enables Banks to go to these facilities. It is an online system for quick transactions settlement in the Banking field.

II. **National Electronic Fund Transfer**

NEFT facilitates individuals, firms and comparators to transfer funds electronically from any branch to another account. RBI has introduced NEFT in 2005. There is no minimum or maximum limit on transferring funds before sending money.
Customers should give accurate and essential details of the receiver’s name, account, number, branch etc.

III. Electronic Clearing Service

ECS helps to transfer funds from one Bank to another. This service facilitates credit and debit transactions directly linked to customer's account. Through ECS customers can pay electronically, such as Bills like mobile bills, telephone bills and other utility bills. It helps customers to avoid late payments and multiple cheques.

IV. Magnetic Ink Character Recognition

MICR facilitates the faster process of cheque clearing. Traditional way of cheque clearing method was delaying the cheque clearing transactions. With MICR method cheque collection and clearing can be done at a faster rate. MICR cheque leaves have (8x3 2/3) standardised size. Bank branch code and account type are printed on this. Magnetic Ink character recognition is used on cheques and deposit slips. It detects those characters and converts them into digital data.

V. Point of Sale Terminal

Point of sale terminal deals with computerised information files of customers. POS is a swipe machine which is provided to a merchant establishment customer without paying cash by swiping their magnetic plastic card which buys goods and services.

Chart No. 3.9 E-Banking Services

(Self created chart)
Core Banking Solution helps customers to transfer funds, to operate accounts and avail all Banking transactions from any branch of a Bank. It creates a network among all branches of a Bank. CBS is used in many ways.

- To get a statement of accounts
- To transfer funds
- To make payments in any branch
- To get demand drafts in any branch

The core banking solution aims at providing efficient and transparent quality services.

I. ATM service

ATM is also noted as Automated Teller Machine or Automatic Teller Machine and it is also simply said in commoners’ language as any time money. It is an electronic communication device installed in the premises of a particular or established outside the area of the Bank to help customers to do their transactions without the need of Bank staff. Customers have to insert card with magnetic strip which contains their Bank’s information and enter the PIN code to perform financial transactions.

II. Email, Voicemail and SMS alerts

The customers are provided with E-mail option. Banks send mails regarding passbook statements and E-Banking services. Customers can also contact managers when they face security and transaction related aspects. Customers with a touch tone phone can directly call concerned department. The automatic Voice recorder is used for queries if the call is not answered. Customers can leave a message to them. This is called Voice mail service. Foreign Banks in India have become successful in providing this service to their customers when customers withdraw or deposit money or repay loans, Banks send automated SMS alerts for confirmation of registered mobile numbers. It is regarded as SMS alert services. It is also a type of mobile Banking.

III. Mobile Banking

RBI issued guidelines for Banks to start mobile Banking transaction in 2008. Mobile Banking technology is a system that allows customers who have smart phones to perform their Banking transaction. It includes
a. Checking Bank statements
b. Monitoring term deposits
c. Accessing to mutual fund and Equity statements
d. Accessing to loan statements
e. Transferring funds
f. Paying bills, etc.

Therefore, it is said that Mobile Banking is an E - Banking service provided by Bank to do transactions in the physical absence of the customer.

IV. Internet Banking

Internet Banking is a convenient E-Banking service provided by the Banks to their customers. With this service, customers can do Banking transaction anywhere or at home or office. Internet Banking service provides the following services:

To check account information
To open fixed deposits
To recharge prepaid mobile or DTH
To pay utility bills
To transfer funds
To open or close accounts

With net Banking transaction customers can avail various services online even after office hours.

V. Card Based Transactions in Banks

Banks issue credit, debit and smart cards to their customers. Debit cards are provided by Banks to help customers to withdraw money anytime and anywhere. They are considered as plastic money. With these cards they can also purchase goods and services without paying cash. ATM machines are established in different areas for home Bank to help customers. These cards are provided with personal identified number (PIN) to check Bank statements, to withdraw money or to make cash payments in shopping centers. Banks also provide smart cards to customers. They are built in microprocessor used for financial transaction. They have unique identity solution. The smart card contains the name of the account holder, card number, photo of the card holder and
others. They are used as electronic wallets and considered to be secure. Banks also provide credit card facilities to their customers. It helped the account holder to purchase goods and services in shopping centers without paying money at that time, but they have to repay that amount with interest to the concerned Bank within a specified period.

**Chart. No -3.10  Communication Networks**

(Self created chart)

Communication networks in Banks facilitate to share and exchange messages with other member Banks. They avoid language barriers and interpretation problems and provide 24x7 communication facility.

BANKNET was introduced by RBI in 1991 to transfer Inter-Bank and Intra-Bank messages within a country by public sector Banks that have membership in this network. COMET has given facility to send messages from minimum 8 lines consisting of 48 characters. Indian Financial Network (INFINET) is satellite based using network, i.e. VSAT (Very Small Aperture Terminal) was introduced by RBI in 1999. It is considered as a backbone for the Indian Banking sector. It consists of 950 VSATs in 127 cities of this country. Society for worldwide Interbank Financial Telecommunication (SWIFT) is a code recognized as a Banks identifier code. Each Bank has its own unique codes. This code comprises 8 – 11 characters. It facilitates Bank to exchange messages with other Banks. The message delivery is very fast.
Each Bank aspires to adopt the best possible strategy to improve performance and to achieve predetermined goals. To this background ICT has become an important tool in redefining and redesigning the Banking sector. This development has assured timeless and placeless Banking business by dismantling significance of the physical structure of Banks.

**Table No -3.1 ICT Services in Indian Banking Sector**

<table>
<thead>
<tr>
<th>ICT Services offered by Banks</th>
<th>Year of Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit card</td>
<td>1981</td>
</tr>
<tr>
<td>ATM service</td>
<td>1987</td>
</tr>
<tr>
<td>MICR</td>
<td>1987</td>
</tr>
<tr>
<td>BANKNET</td>
<td>1991</td>
</tr>
<tr>
<td>SWIFT</td>
<td>1991</td>
</tr>
<tr>
<td>EFT</td>
<td>1995</td>
</tr>
<tr>
<td>Internet Banking</td>
<td>1996</td>
</tr>
<tr>
<td>INFINET</td>
<td>1999</td>
</tr>
<tr>
<td>RTGS</td>
<td>2004</td>
</tr>
<tr>
<td>NEFT</td>
<td>2005</td>
</tr>
<tr>
<td>Mobile Banking</td>
<td>2006</td>
</tr>
<tr>
<td>Cheque truncation system</td>
<td>2008</td>
</tr>
</tbody>
</table>

Source-collected information from RBI

ICT based services help Banks to come out of loopholes of manual system of traditional Banking environment. Today Banks have realised the benefits of this latest technology.

Technological development in the Indian Banking sector started in the year 1962 when the RBI introduced unit record machine to process statistical data. In the year 1967 RBI and the State Bank of India brought computers to their banking operation to maintain branch transaction. The RBI appointed a working group to highlight the importance of computerization of the banking business in 1970. In 1983 The Indian Bank Association (IBA) made an agreement with the National Confederation of Bank Employees (NCBE) and All India Bank Employees Association (AIBEA) to start the computerisation process at branches and head office level of Banks. Computers in the Banking sector were used at that time for the following reasons.
- For investment management
- To maintain ledger accounts
- To maintain branch information
- For remittance purpose
- For foreign exchange dealings

Computerization in the banking business included

- Microprocessor
- Electronic legal posting machines (ELPM)
- Main frame computers
- Accounting machines

Those machines allowed installing in 2500 branches, including the head offices of Banks. RBI also insisted Banks to take the assistance from software vendors Viz, CMC Limited, Combol, Unify database and Unix OS. RBI also formed Rangarajan Committee, which was the first committee, which highlighted the importance of computerization in Indian Banks. In 1982 RBI appointed working group on MICR for cheque processing under the chairmanship of Dr. Y B Dhamle to introduce MICR technology in important cities like Delhi, Chennai, Mumbai and Calcutta. T. N. Iyer committee in 1987 also recommended BANKNET, establishment of electronic data processing cells and SWIFT implementation during this period. The Second Rangarajan Committee in 1988 suggested to go for 900 mini computers at all levels of Banks all over India and insisted to automate 2500 branches of Banks in India before entering the year 1994.

In 1983 Indian Banks Association made an agreement with all India Bank Employees’ Association (AIBEA). As per agreement Banks has to follow the following instructions

- Banks who have less than 500 branches should computerise at least 3 branches every year.
- Banks who have more than 500 branches should computerise at least 5 branches every year.
- Banks should install ATMs gradually in all cities
- Setting up pass book printers, note-counting machines, signature verification equipment etc.
WS Saraf Committee in 1994 and Shere committee in 1995 recommended to start E – Payment system. RBI considered technology as a key driver in the Banking business management. RBI in 1998 under the chairmanship of Sri Narasimham appointed a committee to look into various issues concerned with Banking business. The committee recommended to use E – Files and digital signature in Banks. In the same year the RBI also recommended the technical assistance products of department for international development. RBI in 1996 established IDRBT (Institute for development and research in Banking industry) and research and development were encouraged. Vasudeva committee in 1999 suggested to blend INFINET with satellites and microwave lines and to start up V – SAT network for interBank and intra-Bank operations.

In 2001 Mithal committee concentrated on security issues in implementing ICT tools in Banking transactions. The early 2000’s witnessed a tremendous growth of IT tools in Banks computer and communication technologies like Internet, Mobile, ATM and others have lots of potential to redesign the Indian Banking platform. According to the reports of RBI, at the end of March 2011 nearly 97.8percent of public Banks were fully automated, but private and foreign Banks were 100percent computerized in India.

Economic reforms in India opened new avenues to the Banking sector to the global economy. Relaxed rules and regulations of Indian government provided an opportunity to adopt electronic Banking. Especially Private Banks and Foreign Banks became efficient in using ICT tools in their business operations. This trend brought pressure on nationalized Banks to adopt technology enabled services. To maintain healthy competition on the platform of Banking Sector, it has become inevitable for Banks to go for advanced technology in their operations.
Section – B

Research Methodology

3.4 Introduction

Innovation of technology in the Banking sector is changing expectations of customers and increasing awareness about advanced technology is the outcome of the electronic age. The modern technology is saving time and providing quick services to customers. In this background, the present study has made an attempt to analyse the perceptions of customers in both Commercial Banks and Urban Cooperative Banks in the Mysore city. The study is concerned with ICT practices in the banking sector in India. With the introduction of ICT strategy in this sector considerable changes have been achieved in Commercial Banks but UCBs need to rapidly sink into IT revolution. The study is confined to both Commercial Banks and UCBs of India. Therefore performance and ICT usages in Banking are analysed.

3.5 Research Design

The study is concerned with ICT practices in the banking sector in India. With the introduction of ICT strategy in this sector considerable changes have been achieved in Commercial Banks but UCBs need to rapidly sink into IT revolution. This section throws light on the plan, structure and strategy of the present study. Here research design deals with the following important aspects. The present study is based on both quantitative and qualitative research approaches.
The present study has chosen simple random sampling method. Customers and Employees of both Commercial Banks and UCBs are selected randomly from the larger population. The simple random sampling method is used to get a better representation of the larger group of the study area. The simple random sampling method is one of the
types of probability sampling technique to choose both Commercial Banks and UCBs purposeful sampling method has been adopted

Chart No. 3.12 Structure of the Study
3.6 Sample Design

Sample design consists of two elements they are,

I. Sampling Method: Sampling method shows what rules and procedures have been adopted to draw samples of the population, such as data collection method, sample size, study area and study period. Twelve parameters are taken in to consideration for the analysis of trend and the impact of ICT on the performance of Commercial Banks and UCBs.

II. Data Analysis Method: This shows the estimation process for analyzing sample statistics. In this study many different estimators have been used to analyse. A simple random sampling method has been adapted to select customers and employees of Banks and purposive sampling method is used to select Banks in the study area. The study has used a simple percentage method, T-test, F-test, dummy variable method, AAGR, graphical method and chi square test statistical measures to analyse trend, impact of ICT on Banking sector and perception of employees and customers about ICT based services of Banks.

a. Data Collection

The present study is based on both primary data and secondary data.

Chart. No -3.13 Primary data

Two methods are used to gather required information for the present study, Viz, questionnaire, schedule and interview method.

Schedule used for the present study comprises two parts. The 1st part deals with the demographic profile of selected 300 customers and 200 employees on the basis of...
their age, education, gender and occupation. The second part deals with their perception towards ICT services provided by Banks. The present study has used a five point Likert type scales to get information from the respondents. They were asked to rate from 1 to 5. If they rate it indicates that if they mark 1 it indicates that they are highly satisfied. If they mark 5 it means they are highly dissatisfied. It can be shown in a following way,

**Chart. No -3.14 Five Point Likert Type Scale**

<table>
<thead>
<tr>
<th>Highly Satisfied</th>
<th>Satisfied</th>
<th>Do Not Know</th>
<th>Not Satisfied</th>
<th>Highly Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Questionnaire method was used to take information from Bank managers regarding E-Banking services of selected Commercial Banks and UCBs of Mysore city.

**Chart. No -3.15 Secondary Data**

- Various issues of IBA Bullet from 2003- 08 to 2008 - 13
- Report on trend and progress of banking in India from 2003- 08 to 2008 - 13
- Annual reports of NEFSCOB from 2008 - 09 to 2012 - 13
- Books, Journals, working papers and news papers
- Internet sources

The secondary data are collected from various published sources such as RBI reports, NFFSCOB reports and reputed journals, books, newspapers and websites. It is an explanatory as well as analytical research conducted to explain the behaviour and reaction
of both customers and employees of Commercial Banks and Urban Cooperative Banks of Mysore city regarding ICT adoption in Banks.

b. Sample Size of Banks, Customers and Employees

Selecting samples for the study is an important step in research work. The collected samples must be the best representatives of our study area.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Category of Banks</th>
<th>No. Of Banks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Public Sector / Nationalized Banks</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Private Banks</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Foreign Banks</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Urban Cooperative Banks</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>20</td>
</tr>
</tbody>
</table>

Source : Field Work

The Sample for this study is limited to Mysore city of Karnataka State, India. Ten Commercial Banks and ten UCBs of Mysore city have been selected for the study (1/4th of the total Banks in the city). A purposive sampling method has been used to select Commercial Banks and UCBs in the study area. As compared to private and foreign Banks Public Sector / Nationalized Banks are more in number therefore six Banks are drawn from that category. Three Private Sector Banks and one Foreign Bank have been chosen for the study and out of 14 UCBs 10 Urban Cooperative Banks which are using fully or partially the E-Payment and E-Banking methods in Mysore city have been selected.
Chart No. 3.16 Public Sector Banks (Selected for the Study)

Chart No. 3.17

Private Banks (Selected for the Study)
Chart - No -3.18 Foreign Bank (Selected for the Study)

Chart -No -3.19 Urban Cooperative Banks (Selected for the Study)
Table -3.3 Customers and Employees of Selected Banks for the Study

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Category of Banks</th>
<th>No. of customers</th>
<th>No. of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Commercial Banks</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>UCBs</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Total</td>
<td>300</td>
<td>200</td>
</tr>
</tbody>
</table>

Source: Field Work

For the present study, 150 customers from Commercial Banks and 150 customers of UCBs of Mysore city and 100 employees of Commercial Banks and 100 employees of UCBs of the same study area are selected on simple random sampling method. As compared to the number of customers of Banks, the number of employees is less; therefore, the present study has taken 300 customers and 200 employees into an account and 20 Banks are chosen for the study.

**Parameters to measure Performance of Banks**

Indian Banks now a day are making heavy expenditure on ICT tools. In this background, the present study has analysed the impact of advanced technology on the performance, productivity and profitability of Commercial Banks as well as Urban Cooperative Banks in India. Following are the various performance indicators selected for the study.

**Chart No -3.20 Indicators used to Measure the Performance Of Banks**
The Study has analysed the financial performance of both Commercial Banks and UCBs in India with the help of four indicators such as total deposits, total advances, total investment and the total business.

- **Total Deposits**

  Total deposits are shown in the balance sheet of a Bank. Customers place their money in their Banks to get the benefits of the rate of interest provided by the Bank. Total deposits include various types of deposits such as demand deposits, term deposits and others.

- **Total Advances**

  Total advance refers to the credit facility provided by a Bank. Banks may grant short term as well as long term advances for various productive and domestic purposes.

- **Total Investments**

  Total investment is of two types a) investments from offices in India: it includes Indian government securities, domestic securities, bonds, shares and foreign securities. b) Investments by foreign offices of Indian Banks: it includes Indian securities, foreign countries securities and other investments.

- **Total Business**

  Total business is the sum of all deposits, advances and investments of the Bank. It is the best possible measure of analyzing the performance of any Bank.

- **Indicators used to measure Branch Productivity**

  The study considers deposit per branch, advance per branch and total business per branch to analyse the branch productivity of selected Banks.
Chart. No. 3.21 Indicators used to measure Branch Productivity

- **Deposit per Branch**
  Deposit per branch shows the effectiveness and efficiency of a Bank. Higher the deposit per branch, higher would be the productivity of a branch. It is calculated as
  
  \[
  \text{Deposit per Branch} = \frac{\text{Total deposits}}{\text{No. of branches}}
  \]

- **Advances per Branch**
  Credit per branch ratio shows the credit policies as well as the rate of interest offered by a Bank. Higher the ratio, higher would be the productivity of a Bank. It is calculated as
  
  \[
  \text{Advances per Branch} = \frac{\text{Total advances}}{\text{No. of branches}}
  \]

- **Total Business per Branch**
  Business per branch ratio gives a correct overall picture of the total productivity. Higher business per branch ratio shows the higher productivity of a branch. It is calculated as
  
  \[
  \text{Total Business per Branch} = \frac{\text{Total deposits} + \text{Total advances}}{\text{No. of branches}}
  \]

The study has taken a deposit per employee, advances per employee and business per employee to measure the manpower of selected Banks.
Labour Productivity

Labour productivity plays an important role in analyzing the total productivity of a Bank. This part of the study deals with the deposit per employee, advances per employee and Business per employee.

► **Deposit per Employee:**
This ratio shows the capacity of employee in collecting the deposit in a branch. When deposit per employee is higher it is an indication of higher productivity per employee. It is calculated as

\[
\text{Deposits Per Employee} = \frac{\text{Total Deposits}}{\text{No. of employees}}
\]

► **Advances per Employee:**
This ratio shows the skills of employees to convince customers to avail the credit facilities of Banks. Higher the advances per employee ratio, the higher the productivity per employee. It is calculated as

\[
\text{Advances per Employee} = \frac{\text{Total Advances}}{\text{No. of employees}}
\]
Total Business per Employee:

Business per employee reflects the total deposits collected and loans disbursed by a Bank. When the business per employee ratio is higher the productivity of employees is also higher in the Bank. It is calculated as

\[
\frac{\text{Total deposits} + \text{Total advances}}{\text{No. of branches}}
\]

The study has taken an important indicator, i.e. return on investment to measure the profitability of Banks.

Chart. No -3.23 Indicators used to measure Profitability of Banks

Profitability of Banks

Like all business organizations, banks also purely do their business to earn maximum profit. Though social justice is a main concern, profit plays a major role. The profitability of a bank is measured with return on investment.

Return on Investment:

This shows that whether a company is utilizing its available resources in an efficient manner. Higher the returns the profitability of a Bank would be more. Return of investment is calculated with the formula-

\[
\frac{\text{Net profit}}{\text{Investment}} \times 100
\]
It is also helpful to evaluate the efficiency of an investment in a Bank.

Chart. No -3.24 Parameters Selected to analyse Perception of Customers and Employees

Modern Banking sector today is providing a variety of E-Banking services. The present study has taken the following E- Banking Services to analyse the perception of customers.(explanation is given in 3rd chapter).

Chart. No -3.25 Parameters used to analyse the Satisfaction Level of Employees
Indian Banks now a days are spending a maximum amount on ICT tools in their Banking activities to attract more customers and to increase the productivity of employees. In this background the present study has analysed satisfaction of customers of Commercial Banks as well as Urban Cooperative Banks in the study area. The above are the various performance indicators selected for the study to analyse the satisfaction level of both customers and employees.

c. Study Period

The time period for the present study has been taken from 2003 – 04 to 2012- 13. The entire study period is divided into two parts.

Chart. No -3.27 Division of Study Period
Though ICT services were encouraged during the 90’s in Indian Banking Sector, the big step was taken to introduce E – Banking services at a maximum level only after the year 2002 – 03. RBI appointed a Committee on Internet Banking under the chairmanship of Sri Mittal in 2001. Banks started to use RTGS and NEFT after 2003. RTGS and NEFT actually started a new era in the banking field in this background study period has been started from 2003-04.

After introducing internet Banking E- Banking gained momentum and Banks started to sink into E- Banking revolution. Financial Sector Technology Vision Document 2008 of RBI stressed 100 percent computerization and advised to complete the implementation of Core Banking Systems by Banks. Mittal Committee which was appointed by RBI in 2001 also recommended Commercial Banks to adopt E-Banking services in their branches and also advised them to provide secured services to their customers. Till 2008 there was no any committee to suggest ICT based services in UCBs but under the chairmanship of Sri. R. Gandhi RBI appointed a working group on IT support for UCBs in Jan 2008. This Committee advised that

- Small and weak UCBs should be supported by RBI for their IT efforts
- The core banking solution must be adopted by all UCBs

The Committee also suggested that to adopt IT tools UCBs need to be provided interest free loan repayable in 7 years by RBI.

In this background the study period is divided into two parts to know the impact of ICT before the formation of the working group on IT support for Urban Cooperative Banks [2008] and after 2008 to till 2013. In this context study has taken the time period from 2003-04 to 2012-13. The study period is divided into two distinct parts.

d. Profile of the Study Area

The Survey of business today 2011 found that Mysore occupied the 5th place in the list of Best cities in India in the field of business and third largest city in the state. Mysore is an important center of tourism, trade, yoga, Industries and research centers. Mysore city is also called as a capital city of Yoga. This city has reputed educational institutions for study. World renewed research institutions such as central food
technological research institute (CFTRI), Central Sericulture Research and Training Institute, Central Institute of Plastic Engineering and Technological Research Institute, All India Institute of Speech and Hearing, Defense Food Research Lab rotary, New Security Note Printing Press, Bharath Earth Movers Limited and National Daily Development Board.

Mysore city has given place to major industries such as Karnataka Industrial Areas Development Board (KIADB), TVS Motor Company Ltd, Automotive Axles Ltd, Karnataka Silk Industries Corporation (KSIC), Nestle India Ltd, AT & S India Private Ltd, VKC Sandals, JK Tires, Falken Tires and Mysore Sandal Wood Oil Factory etc.

The cultural city, Mysore attracts millions of people every year. During the financial year 2013–14, 32,47,746 tourists visited Mysore to see more than 72 places in and around Mysore city. This city is also becoming IT hub next to Silicon city Bangalore. This city is regarded as 2nd software exporter in Karnataka. It has well equipped technical training center of Infosys Ltd, Global Service Management Centre of Wipro Technologies and other major IT companies such as software paradigms, WEP Peripherals Ltd, Lorsen and Toubro InfoTech (L & T), Comat Technologies, Theorem India Pvt Ltd, Excel soft Technologies etc. There are more than 70 companies are located in this city, software exports from Mysore city is 4 percent of the total IT exports of Karnataka State i.e. Rs 1.35 crore.

This city has also a large number of reputed, Nationalised, Private, Foreign and Urban Cooperative Banks. All Banks have got good business due to the developmental activities in the economy of Mysore. Mysore is a rapidly growing city next to Bangalore in Karnataka and has more UCBs in South Karnataka next to Bangalore. Banks are playing vital role in meeting the needs of customers and also seeking better opportunities to enhance their business activities. In this background the present study has taken Mysore city as a Case study.

II. Data Analysis Method

The present study has adopted the following advanced statistical tools to analyse the data. They are as follows,
<table>
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<tr>
<th>Statistical Tools</th>
<th>Analysis of data</th>
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<tr>
<td>Graphical Method</td>
<td>To trace the trend in E-Payment and E-Banking services, financial performance of Banks</td>
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<tr>
<td>AAGR (average annual growth rate) Method</td>
<td>To compare the growth between Commercial Banks and UCBs in India</td>
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<tr>
<td>F-Test</td>
<td>To find the significant difference in variance between the period of technology up gradation and Period of rapid usage of technology.</td>
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<tr>
<td>T-Test</td>
<td>To find the significant difference in mean value between the period of technology up gradation and Period of rapid usage of technology.</td>
</tr>
<tr>
<td>Dummy Variable Analysis</td>
<td>To estimate the impact of ‘time period’ i.e. Period of technology up gradation and Period of rapid usage of technology on the performance, productivity and profitability of Banks</td>
</tr>
<tr>
<td>Chi-square Test</td>
<td>To find the significant association between Bank type and satisfaction level of customers as we as employees on E-Payment and E-Banking services in study area i.e. Mysore city</td>
</tr>
</tbody>
</table>
3.7 Summary

Technology stands as a key given to run the economy to reap maximum benefits. It is advocated by many economists all over the world. Technology led theories also emphasised the role of technology based economic models. Sigfried Giedion, Leslie White, Lynn White JR, Harold Innis and Marshall Maluhan who are considered as technology push theorists stated that technology advancement in the economy brings a wide range of fruitful results. Lynn White in his book ‘Medieval Technology and Social Change’ stated that technological innovation quickly leads to development in the modern world. Christopher Evans, one of the technological determinants said that computer technology would bring wonderful transformation in the society at all levels. Mysore City being one of the growing cities next to Bangalore has attracted and put red carpet welcome to reputed IT companies. Easy traffic, excellent connectivity of roadways and railways, aircraft landing facilities, reputed research centers, educational institutions, attractive tourism places and well equipped banking business centers have posed plenty of opportunities foreign investors to select this city. As business activities are increasing there is large scope for Banking industry, Commercial Banks have well equipped buildings and are offering technology based services to their customers. On the other hand UCBs in majority are on traditional Banking method, but few UCBs are offering variety of services to their customers.