

# **Chronological Review of Technology Use in Indian Banking Domain An Evolutionary Study of Technology Use in Indian Banking Domain [A Study of ICT Evolution in Indian Banking Domain]**

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## **Abstract:**

*India represents one of the largest banking infrastructures in the world. There have been a tremendous growth and diversification in Indian banking domain since independence. The country's economic liberalization initiatives in late 1980's and early 1990's exposed the Indian banking domain to world competition. With the time, the concept of internet banking has got attention in the Indian context. Most of the banks have already implemented the e-banking facilities, as these facilities are beneficial to both i.e. banks as well as consumers. The banks are facing many challenges and many opportunities are available with the banks. Many financial innovations like ATMs, credit cards, RTGS, debit cards, mobile banking etc. have completely changed the face of Indian banking. Thus, there is a paradigm shift from the seller's market to buyer's market in the industry and finally it affected at the banker's level to change their approach from "conventional banking to convenience banking" and "mass banking to class banking". So, in our study we are going to discuss regarding the banking system with their effect in current world.*

**Keyword:** Bank, Internet Banking, ATM, RTGS.

## **I. INTRODUCTION**

India represents one of the largest banking infrastructures in the world. It is estimated that about 130+ different banks and 50,000+ bank branches are there in India (XYZ). There have been a tremendous growth and diversification in Indian banking domain since independence. The country's economic liberalization initiatives in late 1980's and early 1990's exposed the Indian banking domain to world competition. The Indian banks were finding it difficult to compete with international banks in terms of the customer service. Use of technology, specifically Information and Communication Technology (ICT), in banking domain was the key differentiator in this regard. It was identified that development of a sound and adequate ICT infrastructure in Indian banking domain was a necessity to meet the challenges. The follow up ICT revolution had a great impact on Indian banking domain. It started with automation of various banking services leading to today's online banking in India. Today the use ICT in Indian banking domain has increased many folds after its initial introduction in 80's and 90's. This made researchers curious about technology usage growth over this period, and motivated them to conduct its evolutionary study.

## **II. LITERATURE REVIEW**

As the researchers were interested to study the use of technology in Indian banking domain from chronological perspective, the literature review was focused on three aspects; need for evolutionary study, evolutionary study of technology use in banking domain across the world and status of such studies in India.

## 2.1 Need for Evolutionary Study

John Lee [1] stated that in our increasing desire to control our own destinies, we seek to understand not only our contemporary technology, but also to look to the past to recognize trends that will allow us to predict some elements of the future. Looking backward to discover parallels and analogies to modern technology can provide the basis for developing the standards by which we judge the viability and potential for a current or proposed activity. We also have a feeling of responsibility for preserving the achievements of our forebears through the establishment of archives and museums. He further added, we can maintain a record of development of the chronology of inventions, events and decisions. There are some lessons that need to be resurrected, repeated and extended. There are others that, having been forgotten, ignored or put aside, are now in danger of being repeated. He quoted that “We need to know enough about our history not only to protect ourselves against it, but also to learn from it.”

In the very first conference on history of computing held at the Los Alamos National Laboratory in 1977 [2] was keynoted by Richard Hamming who entitled his talk “We would know what they thought when they did it”. While answering the question “What is history or study of evolution?” he quoted that, “A history of computing pursued the contextual development of ideas, rather than listing names, dates and places. Contemporary history is the activity that allows us to look behind us and to recognize pioneering efforts and contributions. Failures may teach us as much as successes but it takes a particular style of learning to appreciate & use that information appropriately.”

John Impagliazzo [3] has mentioned the importance of study of evolution in computing courses saying that computing history can be an effective pedagogical tool to teach computing tools. It will result in computing courses becoming more interesting and can stimulate students. We should keep in mind that unless we understand even need to study about past, we might easily repeat the past.

Philosopher George Santanya quoted that, “Those who cannot remember the past are condemned to repeat it.” Learning from our mistakes can lead to subsequent success; failure is the ultimate teacher. The inclusion of history in courses can stimulate new ideas and concepts. Curiosity is another history trait. We can also find why an idea, product or project had failed.

Merely recording the achievements of computer science and technology is not the study of evolution stated Qing Jiao and Haihang Lv [4], Alternatively, it's a history full of the struggles, twists and turns of scientists in the development process and even crises they faced in a certain time. Old generation scientists have worked so hard on the research for three hundred years that some have dedicated their whole lives to their work. This is also the past of the struggle of scientists to resolve challenges and pull through crisis, from which people can obtain a deeper understanding of the methods, devotional spirits and thoughts of scientists.

Arthur L. Norberg [5] perfectly describes that technology historians have focused their attention primarily on the path from invention to development to production. Occasionally, they discussed the social effects on technical behavior and the social implications of the implementation and use of a new tool or technique on technology. Their efforts have produced a wide range of discussions on factors of innovation and social change in a variety of historical contexts. Such discussions vary from large analyses of historical phenomena, such as the Industrial Revolution, to thorough analyses of a particular technology 's growth and effect.

It is written in an international standard published report [6] that past research, including evolution or history, broadens one 's perspective on the field and helps students and scholars to examine people's inner thought and the events they created. History allows individuals and organizations to learn from past incidents and establish practical and realistic thought process. History can be seen as part of human understanding and how computer advances have influenced the human world. There's a need to understand how this field has developed and matured for computing students? What are the pioneers of computing? The ACM and the IEEE computer society developed curriculum guidelines for computing

course, known as computing curricula 91, in a joint effort in 1991. The information list of universities that began computer history courses appears in this article.

## **2.2 Evolutionary Study of Technology use in Banking Domain across the World**

Amy Weaver Fisher and James L. Mckenney [8] discussed in detail about the development of ERMA banking system [11]. They discussed minute details about Stanford Research Institute (SRI) and Bank of America worked to create ERMA (Electronic Recording machine-Accounting) and to develop the MICR (Magnetic ink character recognition) check coding system. The work on this project demonstrates the necessity of senior executive involvement, strong leadership, and innovative engineering.

Another article written by the same authors [10] relates to the Manufacturing of the ERMA Banking system. the Bank of America selected General Electric Corporation to manufacture production models for which the announcement was made in April 1956. Within a relatively short time GE worked along with the bank to develop ERMA systems, around 32 were developed. With guidance on paper handling strategies and character reading and with detailed programming assistance of the operational measures needed for the new equipment, SRI has contributed to the general Electric 's growth efforts. the newly accepted MICR (Magnetic Ink Character Recognition) method had incorporated and transistorized the advanced system for reading cheques. The entire banking industry has felt the effect of the systems. It is proposed that the ERMA initiative clearly demonstrates that a professional consumer who works with a qualified technologist can develop and execute a program with state-of-the-art technology that meets essential needs. Up until 1970, ERMA acted as the accounting machine and control system for the Bank [12].

The website of Stanford Research Institute [9] states that the most difficult challenge to be solved was enabling the machine to read the necessary information from cheques, deposit slips and other routine documents. Amy Weaver Fisher and James L.Mckenney have series of articles published under the series about “computer use at Bank of America”.

### **Status of Evolutionary Studies in India**

In his research paper titled as “Early history of the Telegraph in India” [13] P.V.Luke mentioned that while tracing the history of the electric telegraph about India that India was not behind hand in the investigation and employment of the novel method of communication. He further added the contribution made and series of experiments done by Dr. O’Shaughnessy, Professor of Chemistry in Medical College at Calcutta [11].

Rao and Parthasarathi [14] in their study stated details about historical development of Electronics industry in India.

S. Sandhaya Madan and Shwetha Manimuthu [15] have done a descriptive and detailed research on the origins and development of hydroelectric and thermal power systems in India.

## **2.3 Research Gap**

An analysis of literature review revealed following research gap to be explored by the researchers:

- Evolutionary studies from the technology perspective, specifically focused on ICT, is a recognized research avenue across the world.
- Evolution of technology implementations in banking domain been studied in other countries across the world.
- Similar technical evolutionary studies been done in Indian context from domains like telegraph [11], electronics [12], hydroelectric and thermal power systems [13] and electrical efficiency of computing [14].

As evolution of technology implementation in banking domain not been systematically studied so far, it was identified as the research gap to be explored through this research.

## **2.4 RESEARCH OBJECTIVES**

The identified research gap was formulated as research problem statement as follows:

**Research problem statement:** This research proposes to conduct a chronological review of technology use in Indian banking domain.

Researchers designed following research objectives to collectively answer the proposed problem statement:

- identify important technologies, events, people and organizations involved in use of ICT in Indian banking domain
- establish possible relationships amongst them
- prepare the evolutionary graph of ICT use in Indian banking sector
- create a knowledge base to provide foundational framework for further research in this domain
- appraise the effect of ICT on Indian banking domain
- explore and appraise e-banking in Indian banking domain

### 3. RESEARCH METHODOLOGY

This research conducts study of technology implementation in Indian banking domain. This scenario represents an instance of technology i.e. ICT. This one instance (case) is studied in depth to understand its chronological use in given context. As case study research investigates a phenomenon within its context (Oates, 2007; Yin, 2003a) researchers selected it as research methodology for this research.

#### DESIGN OF CASE STUDY

A case study performs a detailed study of a phenomenon in its real-life context. These two aspects with respect to this research are defined as follows:

**Phenomenon under investigation:** chronological use of ICT

**Real-life context:** stakeholders, processes, sequence of processes and their corresponding timeframes involved in Indian banking domain

**Type of case study:** There are basically three types of case studies: exploratory, descriptive and explanatory (Yin, 2003b). This research follows Descriptive Case Study as it proposes to conduct detailed analysis of a particular phenomenon in its context.

**Number of instances:** A case study may examine one or multiple instances. This case study observes multiple instances from Indian nationalized banking domain.

**Criteria for case selection:** Instances providing uniformity in their real-life context help to generalize the findings. Therefore researcher selected all instances from Indian nationalized banking domain.

**Observation timeframe:** A case study may follow one of the three approaches with respect to time; historical study, short-term contemporary or longitudinal. This chronological research appropriately follows historical study timeframe, and was conducted over a period of one year.

**Data collection method:** Survey, observations, interviews and document analysis were used as primary data collection tools for this research.

The article explores this chronological case study through three distinct phases representing past, present and future: initiation of technology use in Indian banking domain, current status of technology use in Indian banking domain and future trend of technology use in Indian banking domain. It then analyses the collected data to reports its findings [11]. A feasibility analysis then conducted to explore a possibility to generalize case study findings.

#### DATA COLLECTION

As stated in design of case study section this case study used survey, observations, interviews and document analysis methods to collect relevant data.

##### Document Analysis

Researchers initiated their study with secondary data collection. Internet was used a primary channel for this data collection. Technical reports published by authorities in Indian banking domain (e.g Reserve Bank of India) were collected during this stage to conduct detailed document-analysis. This provided the starting point for the research.

## Survey

Researchers initiated primary data collection using survey method. Document-analysis of collected secondary data provided information about technology related entities involved in Indian banking domain. Researchers decided to conduct a survey to collect technology related inputs from identified stakeholders. An open-ended questionnaire was prepared as a data collection tool for conducting a survey to understand technology use in Indian banking domain from the perspective of involved stakeholders [12].

**Sample size:** The secondary data revealed that current Indian banking domain consists of 130+ different banks. This effectively set the population size to approximately 130. This resulted into a sample size of 30 to conduct the survey.

**Selection of sample:** Stratified sampling was used to consider both the two categories of stakeholders involved in Indian banking domain; professionals from Indian banking domain directly involved in technology related activities and customers using banking services. 15 respondents from each group were selected for the survey. Researchers observed conservative approach from the stakeholders to share expected information. Therefore, convenient sampling strategy was used to conduct this survey.

**Data collection methodology:** Paper questionnaires were circulated among the respondents to collect their suggestions. Researchers also validated the suggestions through interviews to understand rationale behind them.

**Data analysis:** Analysis of the collected data is documented in further sections of this article.

## Observations and Interviews

Researchers used the result of this survey to conduct observations and interviews to further understand the domain. Following sections synthesize overall information collected with respect to technology use in Indian banking domain.

## INITIATION OF TECHNOLOGY USE IN INDIAN BANKING DOMAIN

Banking Commission and Reserve Bank of India (RBI) appointed various committees from time to time since country's independence in 1947 to organize and expand the reach of banking sector in India. But up to 1983 there were no major changes in mechanization and computerization in the banking industry in India.

In July 1983, RBI appointed a committee under the chairmanship of Dr. Ranganrajan to assess and propose mechanization in Banking Industry. The report submitted by the committee covered various aspects of mechanization like the areas of banking operations to be mechanized and the type of machines to be installed at branch, regional and head offices. The committee proposed that at the branch level, a system will have to be so designed to ensure generation of data as a by-product of the operations. Following this the branch level mechanization was implemented under Model-I as stand-alone electronic ledger posting machines with attached memory modules [11].

It was followed by an agreement between the Indian Banks' Association and the All India Bank Employees' Association, in September 1983, on the installation of electric/electronic machines, microprocessors, and mainframe computers to support specified functional areas in branches, zonal offices and head offices of various major banks in India [12].

## CURRENT STATUS OF TECHNOLOGY USE IN INDIAN BANKING DOMAIN

The current technology usage scenario in Indian banking domain is dominated by extensive use of ICT to provide banking services over the Internet, termed as electronic banking. Daniel (1999) defines electronic banking as the delivery of information and services by banks to customers via different delivery platforms that can be used with different terminal devices such as personal computer, smart phone, traditional telephone or digital television. It includes services like Real-Time Gross Settlement (RTGS), National Electronic Funds Transfer (NEFT), Electronic Clearance Service (ECS), Smart Cards

(Debit/Credit), Cheque Truncation System (CTS), Automated Teller Machine (ATM) kiosks and Mobile banking.

Note: Considering the dependency of e-Banking on Internet, it is used synonymously with Internet Banking.

### e-Banking in Indian Banking Domain

e-Banking as a delivery channel of banking services and a strategic tool for business development has gained wide acceptance in Indian banking domain. It is on threshold of a major revolution with e-Banking set to become preferred channel of its customers. Researchers found that almost all banks do provide e-banking services to its customers with varying degrees of sophistication.

### 3.1 ANALYSIS OF CASE STUDY

Analysis of collected data revealed certain chronological milestones with respect to use of technology in Indian banking domain (Table 1).

**Table 1: Chronological use of Technology in Indian Banking Domain**

| Chronology   | Status of Indian Banking Domain   | Objective                              | Use of Technology   | Technology Milestones   |
|--------------|---|--|---|---|
| Up to 1969   | Pre-nationalized stage characterized by private control of banks  | Higher profitability                   | Dependency on manual workforce                            |   |
| 1969-1990    | Post-nationalized stage characterized by Government of India's control of banks                             | Social banking                         | Initiation of computerization                             | <b>1984-88:</b> <ul style="list-style-type: none"> <li>Use of Advanced Ledger Posting Machines (ALPM)</li> <li>Use of personal computers with hard disks</li> <li>Introduction of Magnetic Ink Character Recognition (MICR) Cheque</li> </ul> <b>1990:</b> Introduction of total branch computerization covering all aspects of branch-level transactions |
| 1991-2000    | Economic reforms stage characterized by entrants of foreign and social banking, and initiation of e-banking | Higher profitability and Competition   | initiation of e-banking                                   | <b>1991:</b> India joined Society for Worldwide Interbank Financial Telecommunication (SWIFT)<br><b>1997:</b> Setting of shared payment network system<br><b>1999:</b> Introduction of smart cards<br><b>2000:</b> Introduction of IT Act, 2000   |
| 2000 onwards | Present stage characterized by customer adoption of e-banking   | New products and services to customers | Wide-spread use of technology based products and services | <b>2003:</b> Introduction of Electronic Funds Transfer (EFT) system<br><b>2004:</b> Introduction of Real-Time Gross Settlement (RTGS)<br><b>2005:</b> <ul style="list-style-type: none"> <li>Introduction of Core Banking Solution (CBS) in Public</li> </ul>   |

|  |  |  |  |   |
|--|--|--|--|---|
|  |  |  |  | <p>Sector Banks (PSBs)</p> <ul style="list-style-type: none"> <li>▪ Introduction of National Electronic Funds Transfer (NEFT)</li> </ul> <p><b>2007:</b> Enactment of Payment and Settlement System Act, 2007</p> <p><b>2008:</b></p> <ul style="list-style-type: none"> <li>▪ Issuing of operative guidelines for mobile banking transactions</li> <li>▪ Introduction of Cheque Truncation System (CTS)</li> </ul> <p><b>2009:</b> Cash withdrawal from ATMs was made free of cost</p> |
|--|--|--|--|---|

Table 2 thematically summarizes information provided in Table 1.

Table 2: Summary of Chronological Use of Technology in Indian Banking Domain

| Chronology   | Area of Focus                   | Technology  |
|--------------|---------------------------------|---|
| 1980s        | Automatic processing of Cheques | Mechanization (e.g. MICR)   |
| 1990s        | Branch connectivity             | Automation of banking processes using ICT                             |
| 2000-2010    | Remote banking                  | Access to banking services over the Internet                          |
| 2011 onwards | Ubiquitous banking              | Access to banking services over handheld devices (e.g. mobile phones) |

The analysis also revealed the intentions of Government of India (GoI) to further enhance depth and width of e-banking services. GoI initiatives like advancement of computerized exchanges, along with United Payments Interface (UPI) and Bharat Interface for Money (BHIM) by National Payments Corporation of India (NPCI) are huge strides for advancement in the payment systems space. Implementation of mobile banking, smart cards and electronic payment systems such as NEFT, ECS, RTGS have increased reach of e-banking services offered by Indian banks. This reach is can be quantitatively observed in terms of 16+ lac 26+ lac Point of Sale devices (POS) and 2+ lac Automated Teller Machines (ATMs).

#### 4. CASE STUDY FINDINGS AND INTERPRETATIONS

The analysis of the case study revealed following findings:

**Opportunity in rural markets:** Rural area contributes towards approximately 70% of national population. This represents a largely untapped e-banking market for Indian banking domain.

**Synchronization of multiple channels:** Banks offer their e-banking services through various channels such as local-branches, web-sites, ATMs, conventional telephones or mobiles etc. This varied use of technology creates confusion for a normal user. Therefore, synchronization among these channels will be required to increase penetration of e-banking services.

**Competitive advantage:** Feasibility analysis has established the economic feasibility of technology use in Indian banking domain. Thus, it will act as a major competitive advantage in Indian banking domain.

**Security risks:** The security analysis has emphasized the aspect of technical vulnerabilities and corresponding risks. It also stressed the point of legal risks. Therefore, Indian banks need to show due diligence in these respects.

**Technical competency of employees:** The effective and efficient implementation of technology use depends upon the technical competency of bank employees. Lack of sufficient knowledge and skills at employee level is one of the major concerns to implement innovative technologies in banking domain. Therefore necessary technical training at all levels on changing trends in ICT is a must for all the banks (Bhattacharyya & Pradhan, 2017)

**Need to increase Internet literacy:** Feasibility analysis has also established the importance of Internet connectivity to ensure spread of e-banking services. This in turn specifies a need to spread Internet awareness among customers for effective and efficient use of provided services.

**Fear of technology:** One of the biggest hurdles in online banking is preference to conventional banking methods by older generation and customers from rural area. Fear of losing money in the online transactions is the major concern and barrier in e-banking usage. Indian banking sector needs to address this fear by taking steps to increase customer faith in online transactions.

#### 4.1. Inferential Analysis

Following is a brief discussion about the hypothesis and tests applied with due justification used for hypothesis testing.

From the analysis done by researcher, the synthesis is presented below: -

##### Hypothesis No. 1

**Null Hypothesis (H<sub>0</sub>1):** Banking services like ATM, Internet Banking, Debit-Credit card and NEFT/RTGS are not the main influencing factors on service accessibility of customers with the adoption of ICT.

**Alternative Hypothesis (H<sub>A</sub>1):** Banking services like ATM, Internet Banking, Debit-Credit card and RTGS/NEFT are the most influencing factors on service accessibility of customers with the adoption of ICT.

The Hypothesis statement consists of multiple variables. To test the hypothesis, it is necessary to find which variables are more significant amongst the listed variables i.e. the data which is collected from the respondents consist of multiple correlated variables; to find out which particular variable plays the significant role, we use data reduction method. The factor analysis is a tool which is used to reduce the dimension so the particular variable spurs out.

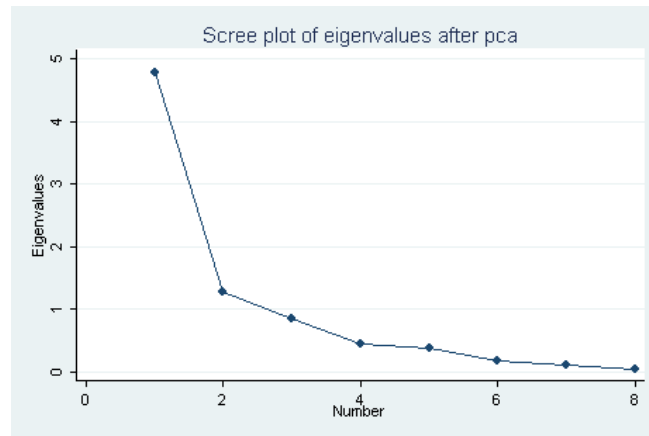
The factor analysis is a statistical method used to describe variability among observed co-related variables in terms of a potentially lowered number of unobserved variables called factors. Precisely it is used to bring together the interrelated variables. The key concept of factor analysis is that multiple observed variables have similar patterns of responses because they are all associated with a latent variable (i.e. not directly measured) named as Banking services.

In every factor analysis, there are the same numbers of factors as there are variables. In the presented hypothesis the variables used are e-banking services i.e. online banking, mobile banking, ATM, phone banking, Debit/Credit card, ECS facility, NEFT/RTGS and SWIFT. The eigen value is a measure of how much of the variance of the observed variables a factor explains. Any factor with an eigenvalue  $\geq 1$  explains more variance than a single observed variable.

The Principal component analysis (PCA) method has been adopted for factor analysis. The Scree plot is taken before moving further with the factor analysis the scree plot gives idea for how many factors should



we consider for factor analysis? It is observed after inputting all 8 variables that factor analysis has to perform till two factors. Graph below shows the scree plot:



In the above table the two coordinates are above the Eigen values 1 reveals that, the factor analysis should perform with 2 limit of factor extraction. The next step performed is about the validation of the factor analysis. The factor analysis said to be valid only after the significant value of the KMO and Bartlett's test.

**Table No. 4.54: KMO and Bartlett's Test of validation**

| KMO and Bartlett's Test                          |                    |        |
|--|--------------------|--------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | .642   |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 19.769 |
|  | Df                 | 8      |
|  | Sig.               | .000   |

KMO and Bartlett's test show the value 0.642. The KMO value above 0.6 indicates that the correlation is possible between the all considered variables

The observation table of the factor analysis by the Principal Component Analysis (PCA) method gives the value of determinant as 0.002 indicates that there is no computation errors have been encountered during the factor analysis.

**Table No. 4.55: Communalities for factor loading**

|                         | Initial | Extraction |
|-------------------------|---------|------------|
| Avail_ATM               | 1       | 0.927      |
| Avail_Phone Banking     | 1       | 0.74       |
| Avail_Debit-Credit Card | 1       | 0.773      |
| Avail_NEFT              | 1       | 0.689      |
| Avail_ECS               | 1       | 0.975      |
| Avail_Online Banking    | 1       | 0.845      |
| Avail_Mobile            | 1       | 0.652      |

|   |   |       |
|---|---|-------|
| Avail_Swift   | 1 | 0.888 |
| <b>Extraction Method: Principal Component Analysis.</b> |   |       |

The communalities are the variances calculated for the factor loading

**Table No. 4.56: Total Variance Explained**

| Component | Initial Eigen values |               |              | Extraction Sums of Squared Loadings |               |              | Rotation Sums of Squared Loadings |               |              |
|-----------|----------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
|           | Total                | % of Variance | Cumulative % | Total                               | % of Variance | Cumulative % | Total                             | % of Variance | Cumulative % |
| 1         | 4.839                | 46.302        | 46.302       | 1.389                               | 46.302        | 46.302       | 1.372                             | 28.721        | 45.721       |
| 2         | 1.251                | 35.026        | 81.328       | 1.051                               | 35.026        | 81.328       | 1.068                             | 23.607        | 81.328       |

The above table presents the detailing about the factor analysis, there are two Eigen values observed which greater than 1, hence the two-factor extraction performed for this analysis. The last two columns of the variance show that the variability of factor (in all together for eight component) is 28.72% for factor 1 and the factor 2 variability is about 23.60%.

**Table No. 4.57: Rotated Component Matrix**

| <b>Rotated Component Matrix(a)</b> |       |        |
|------------------------------------|-------|--------|
|                                    | 1     | 2      |
| Avail_ATM                          | 0.826 | 0.107  |
| Avail_Phone Banking                | 0.246 | 0.649  |
| Avail_Debit-Credit Card            | 0.669 | 0.084  |
| Avail_NEFT                         | 0.773 | 0.142  |
| Avail_ECS                          | 0.542 | -0.067 |
| Avail_OnlineBanking                | 0.782 | 0.38   |
| Avail_Mobile                       | 0.135 | 0.811  |
| Avail_Swift                        | 0.038 | 0.756  |

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Finally, the Rotated Component Matrix shows the factor loadings for each variable. It is observed after factor loading matrix that, there are two groups of the variables exist in the factor analysis; researcher has named them as group of significant factors and group of less significant factors.

Group 1: Group of Significant factors consist the following variables

- Availability of ATM
- Availability of Debit –Credit Card
- Availability of NEFT
- Availability of ECS
- Availability of online Banking

Group 2: Group of Less Significant factors consist the following variables

- Availability of Phone Banking
- Availability of Mobile services
- Availability of SWIFT

The factor analysis of the variables reveals that the Banking services like ATM, Internet Banking, Debit-credit card and NEFT are the significant influencing factors on service accessibility of customers with the adoption of ICT. Hence, the Null hypothesis constituted is rejected and alternative hypothesis is accepted.

A fore said influencing factor plays key role to decide usage of e-banking services and preference given by customers to use these services with the adoption of ICT. Therefore, invariably it is part of study to consider. Therefore, the second hypothetical statement revealed to test the association between usage of e-banking services and preference level of service by the customers.

## 5. CONCLUSION

In the Indian context, the idea of internet banking has been gaining attention with time. The e-banking services have already been adopted by most banks, as these services support both the banks and customers. Banks face multiple challenges and the banks have plenty of opportunities. The face of Indian banking have totally changed thanks to some of the financial technologies, including credit cards, ATMs, mobile banking, debit cards, RTGS etc., Today there is a shift in industry paradigm from the market of seller's to the market of the buyer's and it eventually has changed the level of the banker and has changed their mentality in the following ways "conventional banking to convenience banking" and "mass banking to class banking." The degree of accessibility that a common man would have to bank for his varied wants and needs has improved due to this step. During the years ahead, e-banking will an acceptable and preferred banking tool.

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