

A QUALITATIVE STUDY ON ROLE OF INFORMATION TECHNOLOGY IN INDIAN BANKING SECTOR

Dr.Meenakshi Sharma

Associate Professor, Birla Institute of Technology, Mesra Ranchi, Noida Campus

Akanksha Choubey

Project Fellow, Birla Institute of Technology, Mesra Ranchi, Noida Campus

Abstract: Banks are central nerve to a nation's economy catering to all financial requirements of credit in every domain of the society. Information Technology in banking means processing, acquisition, storage and communication of all forms of banking data and information through usage of computer technology, for building an efficient banking system enabling economic growth. Banks expecting a growth in their performance have made bigger investments in Information technology. But this improvement depends on, differences in the implementation, effectiveness and use of Information Technology. This qualitative research explores the impact of Information Technology on Indian banking sector. Secondary data was gathered through literature review along with primary data collected through semi-structured in-depth interviews of 48 bankers (including managing directors to branch managers) of 10 public and private Indian banks. Qualitative exploratory interviews resulted to facts like, level of knowledge and awareness amongst consumers, effectiveness of data management, security, safety and service quality.

Keywords: Digital Banking; Mobile Banking; E-Banking; ATM; IT implementation, Information Technology

1. Introduction

Information Technology (IT) has made a revolution in each sphere of human life and Indian banks have been no exception. IT in banking industry means all about usage of sophisticated communication and IT along with enhanced tools and techniques to offer consumers superior services in more secured, reliable and affordable manner, enabling sustainability and competitive advantage. IT in Indian banking system is no longer limited to metropolitans, rather has come to try remote corners of the nation (Kumar and Kalva, 2011; Anbalagan, 2017; Bhullar and Tandon, 2019).

With usage of IT there have been an enhanced penetration (Bhullar and Tandon, 2019), efficiency and productivity (Cavus and Christina, 2016; B., 2020), all around the globe. It has optimized cost and has also helped in undertaking smaller but valuable transactions in a better manner, especially in the field of banking. Banking industry stands at the forefront of Indian economy and innovation is utmost required in this segment in order to apply modern technical devices and retain the market (Jain and Popli, 2012; Cavus and Christina, 2016).

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Indian Banking industry plays a protagonist in the advancement of Indian economy. It even enhances choices, builds new markets and increases efficiency and productivity. ATMs, Electronic delivery channels, self-service machines, e-cards, internet banking and mobile banking are some names of novel outcomes of the procedure of automation and IT implementation in Indian banking sector ((Kumar and Kalva, 2011; Ginotra, 2019).

Present technical environment facilitates supply of multiple as well as innovative banking services and products to consumers. Consumer's expectations have enhanced because of the technological impact and development of IT world-wide resulting to increase in global literacy level (Khan, 2017). Privatization, globalization and liberalization have also brought remarkable changes in banking procedures within India. Enhancement of competitive pressure from the world has enforced banking sector to reconsider the way bank's process(Mallick et al., 2020).

Introduction of IT in banking sector has resulted in banks storing, assimilating and processing information electronically. Banks have also embraced latest IT techniques to survive in the digital world and changing market ecology. Thus, banks are now capable of delivering provisions needed for consumers and offer best possible solution. This technological advancement in banking sector has led to the advancements in the payments and settlement systems (Rawani and Gupta, 2000; Lee and Kim, 2016; Shah and Dutta, 2016; Roumeliotis, 2019; Mallick et al., 2020)

Though banks in India have till date been the earliest towards adoption of technology through automated systems and streamlining their operations, introduction of IT and its routine improvements have enabled many security and trust issues within this sector. The lowering level of human trust with digital banking processes have enabled banks to upkeep higher security levels, continually check frauds, pilferage or abuse and minimize risk as well as cost of handling cash. Banks are now hunting novel ways, not just not to attract but even to retain consumers and attain their trust thereby attaining a well-maintained competitive advantage over rivals(Luo et al., 2010; Shah and Dutta, 2016). With orientation of universal banking, banks aim towards providing all their services and goods within one roof and their efforts are aimed towards becoming customer-centric rather than seller-oriented. Though banks are pushy towards strengthening consumer relation and are trying to move towards 'relationship banking,' consumers are moving away from restraints brought in by traditional banking practices and are hunting novel ways towards convenience, electronic and 24*7 banking (Singh and Singh, 2012; Shukla and Kanna, 2017; Tiwari et al., 2019).

1.1. Research Questions

The study aims to examine the level to which IT has been implemented within Indian banking sector. This paper aims to find answer to below mentioned research questions:

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- RQ1. What is the contribution of IT towards development of Indian banks?
RQ2. What are the challenges faced by Indian banks in changing the IT scenario.
RQ3. What are the various aspects of IT services provided by Indian banks?
RQ4. To what extent has been IT implemented in Indian Banking Sector?

3. Literature Review

Every generation of businesses have their own technological advancements that are to be used and to be dealt with to fulfill needs and demands of the specific time, so is the current generation. Today's technological growth and changes are majorly dependent on Information Technology. Banks being the backbone of a society and a base for all financial activities undergoing within a nation, imitate the economic growth of the country (Tiwari et al., 2019; Mori and Mlambiti, 2020).

Technological innovations and IT implementation in banking sector lowers cost of capital, reduces financial risks, enhances economical intermediation thereby improving bank's welfare. Primary function of IT in banking is to simplify the optimum allocation of financial resources in an uncertain circumstance. Implementation of IT ensures smooth functioning by enhancing the overall efficiency of the banking system by reducing cost and diminishing transaction risk (N. Alkhalidi, 2017; Vijai and Anitha, 2020).

Avasthi and Sharma (2001) analyzed those technical advancements are all set to alter the aspect of banking within the world. They emphasized that technology through transforming the delivery channels in banking businesses, will impact the entire banking market. Later they added that banks in India would need to use technology to enhance their operating efficiency and consumer services. Few authors (Tiwari et al., 2019; Vijai and Anitha, 2020; Ragupathi and Sujatha, 2021) said that Indian banks through focusing on IT implementation will enable resource optimization, develop innovative products and services and will strengthen risk management within this sector. Studies (Singh and Singh, 2012; Shukla and Kanna, 2017; Tiwari et al., 2019) in the past have concluded that, though technological changes and evolution of Internet are amongst most dramatic as well as challenging areas of change in banking sector, IT is the only tool to attain banking goals smoothly with ensuring sustainability worldwide (Sanader, 2014; Shukla and Kanna, 2017).

Studies by (Anandarajan et al., 2000; Sanakulov and Karjaluo, 2015; Sidana, 2017) reveals that advances in technology is set to alter the face of Indian banking. Research by Sidana, (2017) emphasized on challenges faced by banks and its regulatory in the process of IT (IT) implementation and found that IT has affected employee's productivity and has enhanced staff's operating efficiency.

Tiwari et al. (2019) analyzed the way in which technology is affecting banking sector and revealed the fact that IT implementation in banking sector has already and will in future, increase new products, strengthen risk management and handle employees as well as consumers in better manner. The technology has changed the way businesses

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are undertaken. Phone banking and internet-banking are making incursions in a way that branch banking might give up in few years (Mohapatra et al., 2015; Shaikh et al., 2018).

Anandarajan et al. (2000) after analyzing the affect of IT upon Indian financial sector revealed that IT has actually transformed the repetitive and overlapping process of banking, into simpler sole key pressing technology resulting into accuracy, speed and efficacy prone procedure of conducting banking functions.

Shen et al. (2005) evaluated the significance of IT in banking sector. Developments and growth in IT are enabling international pools of financial resources thereby spreading the risk all across the market and decreasing the risk on any specific bank (Ayuketang Nso, 2018). Bhuvana et al., (2016) later supported this study.

Later Goswami (2021), majorly appreciated the novel private banks in India that have adopted IT and have implemented the technology thoroughly. Private sector banks in India with their state-of-art technology have made their roads to e-banking. Indian banks are foraying into net banking offering great convenience to consumers on one hand and resulting to lower operational cost for banks on the other (Mohapatra et al., 2015; Bhuvana et al., 2016; Khan, 2017; T and Rao, 2018; Muazzam and Diwedi, 2020).

3.1 Evolution of IT in Banking

Necessity for inculcation of computers in banking in India was first observed in the year 1980, with an aim to grow computer services, bookkeeping and management information system (MIS) reporting. In the year 1988, Reserve Bank of India (RBI), developed a committee headed by Dr. C. Rangrajan, to analyze the need for computerization in banks. This was the time when banks initiated the use of IT tools and techniques with orientation of Local Area Network (LAN) and standalone personal computers (PCs). Lately, progressions were made and then banks adopted core banking platform and changed branch banking to bank banking. Core banking solutions (CBS) encored enhancement of comfort to consumers and proved to be a promising step towards anywhere and anytime banking. Several CBS platforms such as, BaNCS by TCS, FLEXCUBE by i-flec attained popularity (Saranya et al., 2014; Mohapatra et al., 2015; Muazzam and Diwedi, 2020).

Computerization in Indian banking gained speed after opening of economy in 1991-92 as it raised the competition from private and foreign banks. This was the time when many commercial banks in India started moving towards digital consumer services to remain competitive as well as relevant in the race (Saxena, 2012). Adopting IT has benefited Indian banks in many ways (Figure 1), as they have been able to reduce operational costs and spawn revenue via several channels. According to the last information attained, cost of banking transaction on branch banking is projected to be in a range from Rs.70-75 whereas it is estimated to be around Rs 15-16 on ATM, lesser than Rs 2 on online banking and Rs. 1 on mobile banking (Kamel, 2005;

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Kumar and Kalva, 2011;Shakira Irfana, 2013; Sidana, 2017; Sidana, 2017; Chatterjee, 2018; Tizhoosh and Pantanowitz, 2018).

3.2 IT and innovations in Indian banking

Innovation means something novel that had not been done before and innovation in banking is no exceptional. There are several sections in banks that are going through or have gone through innovations in recent years. They are no more restricted to traditional format of banking methods. Thus, to enhance the business avenues and capture new market share, banks are inculcating innovation especially through implementation of technological advancements (Reserve Bank of India, 2020).

Banking through implementation of IT has emerged as a tactical resource for attaining greater efficiency, operational control and cost reduction through replacement of paper-based works and labor-oriented methods with all automated procedures thereby leading to greater productivity as well as profitability. Indian banking industry is majorly investing in implementation of IT through Robotics and Artificial Intelligence (AI). Machines are being deployed to cater to every small need of today's modern and digital as well as tech savvy consumers. In past years, Reserve Bank of India (RBI) has also attempted to enhance the efficacy of economic system through guaranteeing presence of safe, secured and valid payment system (Oswal, 2014; Tizhoosh and Pantanowitz, 2018; Reserve Bank of India, 2020).

Year 2020, being a pandemic year has been a niche for itself in globe's history regarding major disruption and unforeseen chaos it brought. Banking proved to be one amongst most affected sectors. But, contradictory to its reputation as one amongst darkest years of times, this 2020 also offered some pleasant surprises. Enhancing dependency on the technology paid off and it substantiated to be the biggest ally in people fights to upkeep the businesses and their productivity. (Granja, 2018; MV, 2021).

3.3 Future Challenges for Indian Banks

Technological developments in Indian banking systems present many prospects as well as challenges to the industry. Acquiring or developing the correct know-how of technology, implementing it in finest manner and later leveraging it to maximum extent possible is needed to accomplish as well as maintain higher service standards thereby maintaining cost effectiveness(MV, 2021). Increasing competition throughout the globe has also enforced pressure upon Indian banks towards implementing IT enables services and products in efficient manner. Foreign banks playing in Indian banking sector has increased number of services and products offered by the sector and has laid emphasis on Indian banks to meet consumer's raised expectations (Reserve Bank of India, 2020; Sharma and Choubey, 2021).

India is a nation with vast populace and technological progressions can bring in close integration amid urban and rural population. Basic challenges for banks will be to give consistent services to their consumers irrespective of the customers being rural or

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urban people (Muazzam and Diwedi, 2020). Customer retention is going to be another major challenge for the Indian banks in coming future. Banks will have to emphasize on increasing their market share, as technical enhancements might lead to decrease in market share of a specific bank, not accepting or implementing newer IT and its services on right time. Even with availability of Internet banking and ATM machines, there exist consumers who want personal touch of their neighborhood bank branch. Making them aware and convincing them for acceptance of technology might come out as next level challenge for Indian banks. (Saranya et al., 2014; Sidana, 2017; Asongu and Odhiambo, 2018; Muazzam and Diwedi, 2020).

Few major challenges include making sure that account transaction applications run efficiently amid branches and data centers. Indian banks would now need to work towards a vision to have developed system for retail delivery. Such system will inculcate changes in branches, developed telephonic services and leading edge digital banking operations, which supplies a consistent positive multi-channel experience of consumers.

Competition from private banks and MNCs, management of diversified consumers, consumer's trust issues with developing IT in banking, lowering consumer loyalty, coping with regulatory IT reforms, maintaining higher quality IT enabled goods and services and keeping pace with technical up gradations are some major challenges Indian banks will face in future (Sharma and Choubey, 2021).

Indeed, the advantages of technology have brought a major change in random banking viewpoint, yet the objective of banking is not merely to please but also to engage with consumers thereby enriching their experiences. To successfully achieve this aim, sustainable competitive advantage is to provide the consumers the best mix of traditional and technological services (Cano and Domenech-Asensi, 2011; Fiordelisi et al., 2013; Sharma and Choubey, 2020; Choubey and Sharma, 2021; Kholia, 2021).

Currently, banking is experiencing a technical churn. Major reason behind this is two-fold- changing consumer expectations and enhancing technical capabilities. Providing value-added services IT brings in features that can be effortlessly integrated with the bank's functions through several program interfaces. It encourages banks to undertake efforts for integrating and streamlining their operational abilities and cope with upcoming technologies and changes brought in by them. In near future, few technologies like (Figure 2) Artificial Intelligence, Robotics, Machine Learning, Big data and many more could impact banking procedures and enhance the quality of banking services and products. Fraud detection and identification of better ways of monitoring funds usage by borrowers can be brought in through such technologies. Few upcoming technologies that will shape the future of banking and will impact its operational undertakings are mentioned in Figure 2.

4. Research Methodology

Since the variables are not known due to several facts like lack of reporting by banks, regarding their IT implementation, impacts of IT on banking procedure and also

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because of the topic being new, and lesser addressed within Delhi NCR, qualitative exploratory study was undertaken considering Creswell (2009). The study emphasized on the exploratory interview method to attain better results. Semi-structured questionnaire was designed to enquire the policymakers of the banks regarding their IT implementation practices and also further plans about handling IT advancements. Open ended questions, were used which were thought to be ideal for attaining desired information. The research gathered expert opinions that were of top-level management of the target banks. Fifty individuals of different designations like managing directors and bank managers were chosen using purposive sampling from ten different banks based on their level of information of technology usage and implementation as well as bank's preparedness towards upcoming IT changes. A list of all banks implementing IT practices was attained through their websites and literature review (Dipika, 2015; Ragupathi and Sujatha, 2021; Top 25 core banking software companies and systems, 2021). Top ten banks were chosen on the basis of extent of implementation of IT within their operations. Two branches of each bank were targeted to cover the entire Delhi NCR region.

4.1 Exploratory research

The study being exploratory in nature, emphasized its research questions how (do you feel), what (is your view), why (do you think), in contrary to how many, how much, and additional quantifiable inquiries. Exploratory interviews were supposed to be additionally result-oriented method of delivering pertinent data thought to be necessity for development of a new theory (Amaratunga et al., 2002). Many probing queries such as "what are views on contribution of IT towards Indian banking?" "What are different challenges being faced by Indian banks in this changing IT scenario?" "How do Indian banks react towards changing Information Technology?" "What do you think can be several aspects of IT enabled services provided by Indian banks?" "What is your thought on the extent to which IT has been implemented in Indian banks?" were asked to divulge all the possible information. Advantages of such practical queries were that they supplied an appropriate configuration for reference and also enabled the investigator to reconnoiter deeply (Eisenhardt and Graebner, 2007; Kvale and Brinkmann, 2009).

4.2 Data Collection

For this research exploratory was undertaken and data were gathered through interviews conducted amongst fifty middle and senior level managers of ten target banks involving both public as well as private sector.

Punjab National Bank (PNB), State Bank of India (SBI), Bank of Baroda (BOB), Canara Bank, IndusInd Bank, Axis Bank, ICICI Bank, YES Bank, HDFC Bank and Kotak Mahindra Bank from Delhi NCR region were targeted for this study. From each bank 5 middle-to-lower-level managers were chosen through purposive sampling and interview was conducted using semi-structured questionnaire. Selected respondents were experts in banking and their knowledge in the field of developing technology and IT implementation in banking sector helped them answer the questionnaire in relevant manner enabling collection of perilous facts as well

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as detailed knowledge about IT implementation in Indian banks (Baker, 2002; Eisenhardt and Graebner, 2007). The sampling was thought to be adequate (Carson et al., 2001) as not much research has been done in the field. All the details of respondent's is provided in Table 1.

Particulars of interviews were later chronicled and noted on the paper. Each interview continued for approximately 45 minutes, fluctuating from 30-60 minutes (total number of hours exceeding 40 hours). Face to face interviews were conducted and every interview was categorized into tables involving most relevant heading (Amaratunga et al., 2002; Eisenhardt and Graebner, 2007).

4.3 Data Analysis

After attaining exhaustion point where no more contribution was observed through novel interviews, data analysis was undertaken where detailed content (Flick, 2009) analysis was done for every item was done, with an aim to remove vital façades. Subsequently highlighting, cutouts and freezing was done for nucleus statements linked with the conceptual framework (Saldana, 2012).

5. Findings And Discussion

5.1. Contribution of IT towards development of Indian banks

While answering query regarding the level to which IT has contributed towards development of Indian Banking, a branch manager of ICICI bank in Delhi NCR said, *“IT has not just enhanced the cost effectiveness but has also ensured making smaller value transactions viable.”*

Another branch manager of Punjab National Bank emphasized that, *“Electronic delivery channels like ATMs, card-based payments, web-based banking and mobile banking are few outcomes of the automation processes and IT implementation in Indian banking sector.”*

As per a credit manager of ICICI bank, *“IT enables development of sophisticated products, gaining more market share and implementing tools and techniques that are reliable and are used towards controlling risks.”*

The significance of internet especially in banking and its influence on delivery channels of banking was approved by a branch manager of State bank of India in Delhi NCR. He even mentioned that, *“IT provides proper framework for banking sector to ensure meeting the challenges in current competitive situation.”*

A manager's view also supported this report and who emphasized the fact saying, *“The most noticeable affect that IT has is seen in the manner banks are responding. Banks are reverting strategically towards making optimum use of efficient service delivery. Banks new in the market and smaller in size having limited network and*

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lesser branches have now been placed in a better manner to compete with well-established players in the market. This has been possible only through implementation of IT.”

According to the above views, it can be concluded that today Indian banking sector is stronger and is capable of withstanding the pressures of competition arising throughout the globe. Globally accepted prudential norms have been adopted in Indian banking industry and higher transparency is being maintained, making this sector gradually moves towards adopting the best practices in corporate governance, accounting and risk management ((Uras, 2020; Bharadwaj, 2021).

5.2 Challenges for Indian Banking Sector in changing IT scenario

It was said by a branch manager of SBI that, *“there are many important business challenges that are being faced by Indian banks in changing IT scenario.”*

Another credit manager of a leading private bank mentioned few specific business challenges and said, *“meeting customer expectations and retaining them after providing best IT enabled service and facility offered by banks and also managing the spread of sustainable operating profit is a major challenge for Indian banks in today’s IT scenario”*

A banker informed, *“banks are not merely facing competition from FinTech companies but they are even being attacked by vast technological firms who are BigTechs entering financial service sector.”*

This fact was also supported by an AGM from a private bank, emphasizing *“Several Fintech startups have been established and banks are forced to collaborate with Fintechs and play a role of hybrid model where mobile services interact with banking services.”*

A regional manager of Bank of Baroda and four AGM’s of different branches of SBI, ICICI, PNB, and HDFC were of the general view, *“retaining the market share in the industry and improvement of the same, in the heavily competitive industry, proves to a major challenge for Indian banks.”*

Few managers of different public and private banks mentioned some operational challenges as well and said that, *“focusing on hardware and software updating, attending implementations issues and timely rollout, along with managing technology, security and business risks, are few upcoming challenges that Indian banks will have to deal with in changing IT scenario.”*

Another big challenge for IT enabled banks in India, as per two branch managers of ICICI and IndusInd bank will be to, *“regularly upgrade the skill set of work force and maintain their knowledge and awareness regarding all updated technologies.”*

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The mentioned reviews enable the authors to conclude that due to opening of the economy, mergers, acquisitions, deregulation and, implementation of government regulations, the rivalry amongst players in the market will enhance in future. New banks and merged entities will be novel players giving tough competition to existing ones. This would bring in new opportunities for banks to introduce innovative products and services(Choubey and Sharma, 2021).

Considering such advancements, conventional banking is making its own way towards next-gen banking along with emphasis on modernization and digitization. Requirement of older banks and their branches is being rechecked constantly as technical development and digitization has brought banking to people's fingertips(Das, 2020).

5.3 Several aspects of IT enabled services provided by banks in India

Banking sector in India is geared up for a transformational space along with implementation of developed IT tools and techniques like applications of Artificial Intelligence, Robotics, Block Chain and Machine Learning(Choubey and Sharma, 2021).Covid-19 has also played a major role in fast tracking the digital transformation of banking systems in India. Other than augmenting the broad-based usage of technology, this pandemic has fueled the proliferation of all IT based modes of banking like online payments, access to e-banking and mobile banking, propelling the nation towards "lesser-cash oriented" alternatives.

An AGM of Yes bank stated that, *"implementation of Electronic payment systems like National Electronic Fund Transfer, Electronic Clearing Services, Cheque Transaction System, Real Time Gross Settlement and Mobile banking, have gained rapid acceptance in the Indian banking industry, especially during pandemic"*

A banker stated that, *" Introduction of 24*7 RTGS in the month of December 2020 created an encouraging environment for faster and more secured growth of IT based banking transactions."*

This was backed by another banker, who emphasized that, *"India has now become one amongst few nations across the globe where RTGS system operates round the clock and throughout the year, enabling IT oriented banking to be a deeper part of the industry"*

Four other managers of four different banks said that, *"Use of debit and credit cards as well as usage of Application Programming Interfaces and advanced Artificial Intelligence have all gained wide acceptance in Indian banks and are providing richer real time personalization"*

As per several branch managers from public and private banks, *"IT has influenced banking industry majorly in three aspects. They are: a) IT has impacted the level of competition and has affected the amount of contestability in banking. b) IT has influenced economy of scale and c) IT has impacted economics of delivery of goods"*

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and services in the banking sector.”

Later few branch managers of SBI, PNB and, Canara Bank said that, *“because of the growth of technology, Indian bank’s incomparability is decreasing as entry barriers have been declined and novel competitors have emerged.”* A senior manager of SBI even added that, *“IT has changed the contours of three major functions being performed by banks viz. risk monitoring, transformation of assets and access to liquidity.”*

The above-mentioned views of managers of different banks enable authors to conclude that, IT and its tools have a crucial bearing on efficiency of money, foreign exchange markets and networking systems. Though few monetary services and products have become more crystalclear commodities, consumers are showing willingness towards unbundling the petition for monetary goods as well as services and all this has resulted in more competitive market environment.

Above-mentioned views of banker, was backed by a report by Reserve Bank of India (RBI) where they mentioned that, driving the constant policy support by RBI and Indian government is a necessity for matching the aims of fashioning an appropriate regulatory policy and also making sure that an orderly growth of IT oriented lending scheme exists. In March 2021, all the transactions through RTGS augmented by 70% and through other payment systems such as National Electronic Toll Collection, National Electronic Fund Transfer and Bharat Bill Payment System also grew in the phase of pandemic (Reserve Bank of India, 2021).

Through the views of managers and after reviewing past literature (Muazzam and Diwedi, 2020; Sharma and Choubey, 2020; Choubey and Sharma, 2021) it can be said that, implementation of IT enabled tools and techniques has decreased the dependency upon the bank’s branches as a basic delivery mechanism.

It was supported by reports by Das (2020) and Reserve Bank of India (2021) that if pandemic continues and lockdown extends, people might behave in a manner further embedded but at this juncture banks are in actual dilemma. They are working towards digital growth and amid this covid-19 have built ecology for demonstrating what is possible through IT. However, consumers have not come on this journey for a more permanent transition and more persuasion is yet required to make digital banking a norm (Das, 2020; Reserve Bank of India, 2021).

5.4 Extent of IT implementation in Indian Banking industry

Embracing futuristic technologies has attained substantial momentum throughout the banking sector. Different technological solutions and capability to rapidly adopt the changing technology gives Indian banks a competitive advantage. Indian banks are now quickly developing and employing novel technologies to move aggressively and strategically towards disrupting rather than be disrupted. Major emphasis is being laid on leveraging sophisticated technology to enhance productivity and reach next level of profitability. Indian banking sector has been taking advantage of IT and its tools

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since many years (Tizhoosh and Pantanowitz, 2018; Rather and Hollebeek, 2019; Muazzam and Diwedi, 2020; Reserve Bank of India, 2020; Uras, 2020).

Several branch managers from different banks commonly mentioned some IT enabled products and services of banking industry and said that, *“products/services like Phone banking, Mobile banking, Internet banking, Credit cards, Insta-alerts, Online Payment of Excise and Service Tax, card to card fund transfer, self-service machines, ticket booking, mobile recharges, online bill payments and electronic funds transfers have been few major results of IT implementation in banking sector.”*

A branch manager from Canara bank stated that, *“the scope of frauds in banks is being minimized through use of passwords, dual authentication in online banking.”*

Managers from PNB, SBI and Kotak Mahindra said that, *“to facilitate improved services, banks presented automatic banking services such as Cheque Deposit Machine, Cash Deposit Machine and Machine for passbook printing through these services have become easier.”*

Based on the content analysis depicted in Table 2, it can be said that, 66% of respondents believed that developing technology and implementation of the same within banking services and goods has contributed towards development of Indian banks. While explaining these few bankers revealed how technology implementation into banking has put the world at human’s fingertips and also said that IT has actually enabled better data protection and lesser faults in banking. Several technical advancements like AI and robotics in banking has ensured better consumer experience, and has driven profitability. Majority of bankers who responded i.e. about 72%, were in favor of the fact that with the use of IT banks have become more capable of improving customer service level through avoiding tiring and lengthy banking procedures. Few bankers with examples like standing in long queues, filing a lot of papers and delaying of work due to human involvement, emphasized how implementation of IT has changed the entire scenario and improved people’s experiences.

When asked about challenges and problems that banks are facing while implementation of IT into their products and services, bankers in majority i.e. 68% favor the fact that banks in actual face challenges like gaining people’s trust, security failures, no personal relationship with bankers and inconvenience of a particular segment of consumers is learning new technical banking. Though there are challenges being faced by banks, yet, 78% of respondents who were bankers said that IT enhances bank’s productivity through enabling class product development, healthier market infrastructure, and application of reliable tools and techniques for controlling risks and helping the banks to enhance their geographic reach. Impact of covid-19 was also discussed as an aspect towards implementation of IT into banking, for which 62% of bankers said that covid-19 has boosted the level of implementation of IT enabled services and products in the banking sector. Major use of all IT enabled banking services like online banking, mobile banking, internet banking, e-banking, self-service banking machines etc. was popularized at the time of covid-19 lockdown.

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This new normal has increased people's believe towards IT enabled banking and has essentially ensured more use of the same. 54% of the bankers who were interviewed said that they sense the use of FinTech services as a good idea as it has helped the banks to customize and re introduce few goods and services for easy consumer acceptance. Nevertheless, 76% bankers even supported the fact that FinTech services and the firms using FinTech services are major competitors for banks as through enhancing competition, democratizing access to banking services, and empowering consumers, these services stimulate innovation and upsurges the contest.

6. Conclusion

6.1. Interim Conclusion

IT and India have become synonymous. As far as Indian banking sector is concerned it can be said that although banks in India might not be as technically progressive as their foils in the advanced world, they are yet following major international trends in the field of IT (Reserve Bank of India, 2021).

India is amongst top ten nations of the globe whose banking industry has tremendous IT potential to grow. Number of ATMs has doubled in past 5 years and is further estimated to double by 2025 with up to 50% to be set in smaller towns. Scope of Internet and mobile banking is also vast in the nation. In the beginning only 2% of banking payments were done through electronic system (Sohail, 2017). Today, consumer convenience and mobility being the primary focus towards nation's growth and development, banks are constantly exploring novel technologies with technologies like Cloud computing, Artificial intelligence and robotics being used regularly. However Indian banking sector has faced several challenges like enhancing competition, pressure to spread more, and aligning systematic changes with global standards, necessitating re-valuation of tactics and procedures with an aim to remain competitive in this dynamic ecology (Datta et al., 2017).

6.2. Managerial Implications

Today, banks require proper adoption of holistic approach towards fulfilling the ever dynamic IT needs of customers with an aim to grab better share of market. Building more IT based goods and services with lower cost technology are the key. This again demands in-depth analysis of buyer's need, the competition and the market trend (Sharma and Iyer, 2012; Suharko and Melinda, 2021). Enormous care has to be undertaken while embracing technology and then transforming traditional touch points to IT based ones, in a way that human touch gets retained. Maneuvering firm's efficacy as well as operational competence would govern the existence and growth of profit, besides changing people's mindset, which is imperative with changing times (Reserve Bank of India, 2021).

Initiatives by Government of India, the Reserve Bank of India and the banking sector have resulted to drastic shift towards pervasive digitization that has provided an impetus to technology adoption. It is encouraging change of people's mindset towards

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banking and they no longer see FinTech organizations as disruptive (Indian International Centre, 2021). This change in approach has also provided banking sector a sense of safety and security. There are proofs that FinTech firms are playing roles of enablers in the banking ecosystem. In India banks and other financial service firms are partnering to offer the mix of trust and innovation to the consumers undertaking the “best of both sectors” approach resulting in tremendous growth in number of digital payments that is expected to continue in future (Das, 2020; Indian International Centre, 2021).

6.3. Future research implications

To be successful, banks in coming future will have to embrace the upcoming technology both internally and externally. Management including all top, middle and lower level staffs in future will have to be flexible enough to adopt evolving business models and put consumers at the center of every strategy. Faced with changing customer expectations, novel models for business, and emerging technologies the future of banking will look very different from what it looks today enabling banks to put strategies in place to help them prepare for banking in coming years (Leonidou and Hultman, 2019; Reserve Bank of India, 2021). This study will aim to stimulate and provide an outlet for new research in the area of banking. This research would encourage further analysis of the impact covid-19 had on banking sector especially in the area of IT implementation in banking operations.

7. Suggestion

In coming years, Indian Banking industry will have to focus more on setting up effective Enterprise Risk Management (ERM) function to decrease risk, accelerate performance and meet regulatory demands along with use of IT in its operations thoroughly. Since IT enabled banking is designed to be safe and secure, banks are constantly putting their updated security protocols in place. Moreover, no system is completely guaranteed and account can be hacked, resulting to identity theft through stolen login authorization, acceptance of ERM as a part and parcel of overarching and multi-level governance framework would work in bank's favor.

While it may take very little time to deposit a cheque via a bank's mobile app which is designed on the basis of novel information technology, people still need to wait for access to their money. IT enabled banking services can be further modified to ensure that deposits are reviewed and funds are released for access according to bank policy, which should take lesser time.

Banking regulators need to focus on attainment of a balance between promoting innovation and applying a proportional regulatory framework. This refers to future banking not being a continuance of the past banking format. We would observe a different banking sector regarding structure and business model, in coming times.

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Different sectors of banking institutions might emerge in the coming years. A range of banks will of course characterize reoriented banking schemes. Banking space in future will also involve both traditional players as well as novel technology-oriented players (Kemal, 2018). In emerging technical scenario, a well worked out consolidation of public sector banks could generate synergies in allocation of the workforce and the branches as well as rationalization of functions with an aim to meet upcoming challenges. Main focus of banks has to be on ushering major improvements in growing efficiency and rationalizing of scarce capital (Das, 2020).

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Annexures

Questionnaire

Part A:

Age.....

Designation.....

Duration in current position:.....

Less than 5 years () 5-10 years () 10-15 years () More than 15 years ()

Highest educational qualification:.....

Bachelors () Masters () Ph.D. () Others ()

Part B:

S.No	Questions	Yes	No
1.	Do you believe that technology has contributed towards development of Indian banks?		
2.	Are banks capable of improving customer service level through implementation of information technology?		
3.	Are banks facing problems while implementing IT into their products and services?		
4.	Does IT enhance bank's productivity?		
5.	Has covid-19 enhanced the level of implementation of IT enabled services and products in banks		
6.	I feel that use of FinTech services is a good idea		
7.	Are FinTech companies competitors for banks		

Part C (Please describe in details)

- How much has IT contributed towards development of Indian banks?
- What has been the major contribution of IT towards development of Indian banks?
- What are the major challenges being faced by Indian banks when it comes to changes brought in by implementation of Information technology?
- What are the various aspects of IT services provided by Indian banks?
- What is the extent to which IT has been implemented in Indian banking?

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Table 1: Respondent Profile

S.No	Respondent's Profile	Bank's Name
1	AVP, Male, 45 years	SBI
2	Branch Manager, Female, 44 years	
3	Branch Manager, Female, 42 years	
4	Regional head, Female, 41 years	
5	Credit Manager, Male, 35years	
6	Deputy Branch Manager, Male, 39 years	PNB
7	Branch Manager, Male, 52 years	
8	Branch Head, Female, 40 years	
9	Deputy Branch Manager, Male, 42 years	
10	AVP, Male, 47 years	ICICI
11	Branch Head, Male, 50 years	
12	Credit manager, Female, 32 years	
13	Risk Manager, Female, 39 years	
14	Branch Manager, Male, 43 years	
15	Operations Head, Male, 39 years	HDFC
16	AVP, Female, 52 years	
17	Branch Head, Male, 43 years	
18	Branch Head, Female, 45 years	
19	Operations Head, Female, 33 years	
20	Risk Manager, Male, 45 years	IndusInd Bank
21	AVP, Female, 49 years	
22	Branch Manager, Female, 37 years	
23	Operations Manager, Female, 37 years	
24	Credit Manager, Male, 37 years	
25	AVP, Female, 51 years	Kotak Mahindra Bank
26	Branch Manager, Male, 50 years	
27	Branch Head, Male, 46 years	
28	Branch Manager, Male, 47 years	
29	AVP, Male, 49 years	Canara Bank
30	Operations head, Female, 30 years	
31	Credit manager, Male, 40 years	
32	Assistant Vice President, Female, 52 years	
33	Branch Manager, Male, 43 years	
34	Risk Manager, Female, 42 years	YES Bank
35	Branch Manager, Female, 50 years	
36	Operations Manager, Male, 51 years	
37	Branch Manager, Female, 43 years	
38	Branch Manager, Female, 52 years	
39	Branch Manager, Female, 49 years	YES Bank
40	Service and Operations Manager, Female, 40 years	

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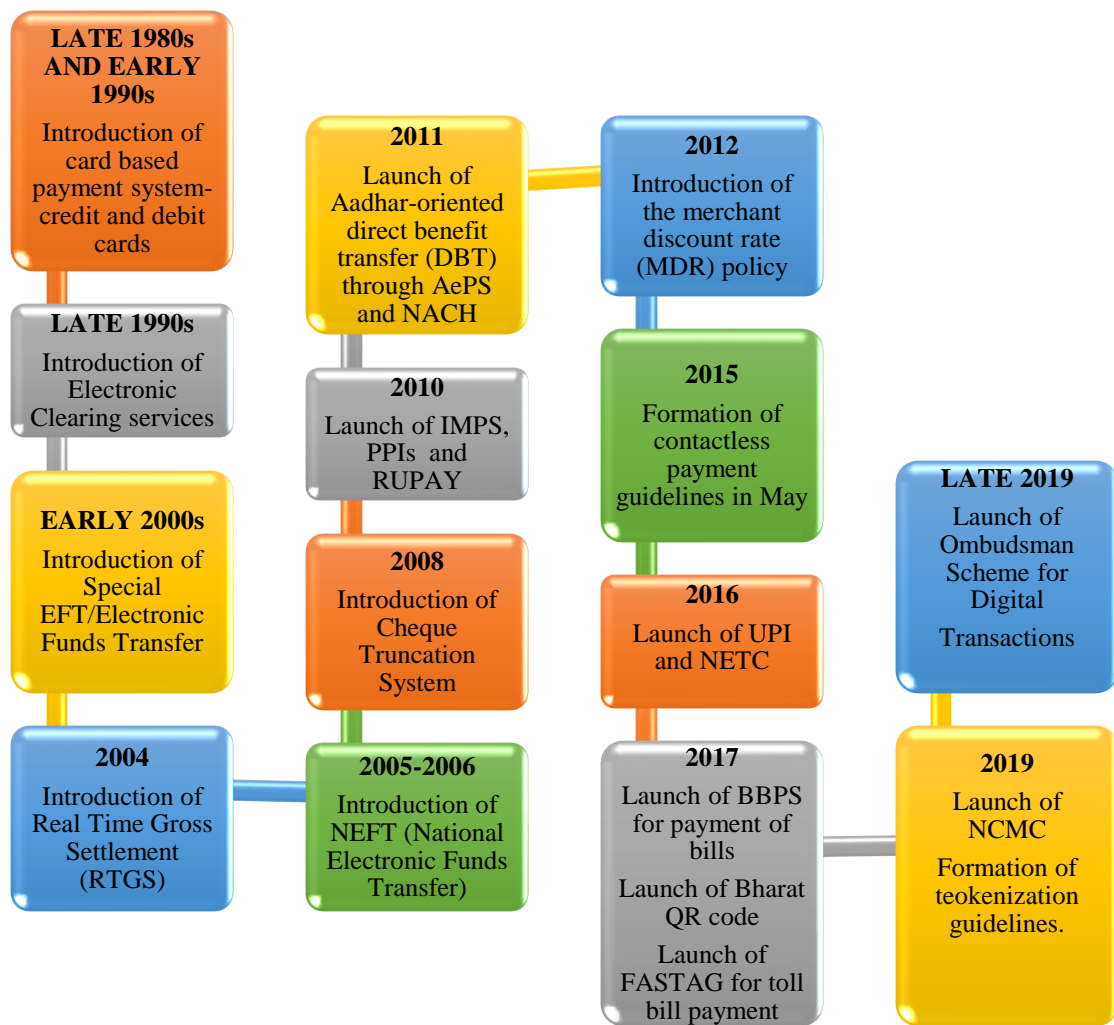


Figure 1: Major events in the evolution process of payment system in India
Source: (Shenbagaraman and Kumar, 2017; MV, 2021)

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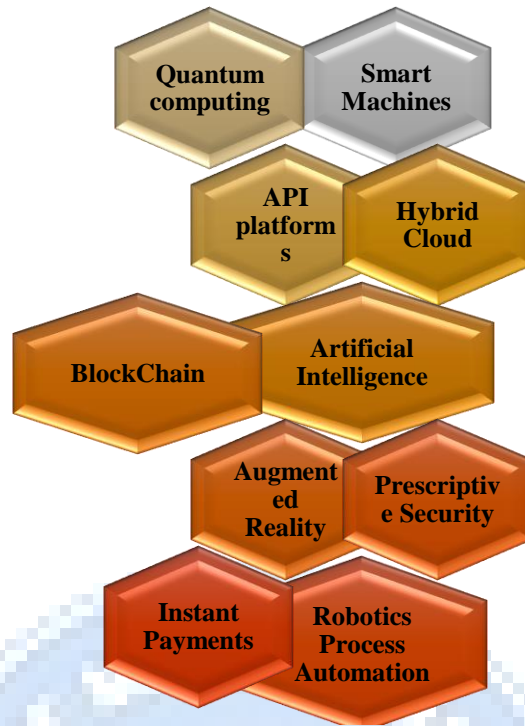


Figure 2: Upcoming disruptive technologies tending to shape the future of Indian Banking Sector

Source: Adapted from (Bharadwaj, 2021; Top 25 core banking software companies and systems, 2021)

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