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A STUDY ON DEVELOPMENT OF TECHNOLOGY AND CUSTOMER ACCEPTANCE OF BANKING 4.0

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ABSTRACT:

Purpose: The present study attempts to understand the developmental role played by technology in the transformation of present banking system. The study also makes an attempt to analyses the consumer perception towards the acceptance of technology in banking.

Study design/methodology/approach: The present study is descriptive in nature and mainly based on available literature in this field of study. Further, the survey has been drawn from users of banking in Delhi-NCR region (N= 236). The proposed hypothesis were tested using student's T-test.

Findings: Results indicate that technology has played a foremost role in the development of Banking 4.0, Industry 4.0 and Fintech 4.0. Generation Z has shown a significant higher acceptance rate in using new models of banking.

Practical Implications: The findings of the study are valuable to the bankers and researchers as it presents all-inclusive view of banking 4.0. The study also reveals that youth is ready to try and accept new features of banking, thus banks can make more techno-advanced services for this section of consumers and less techy services can be offered to other customer groups.

Originality/ Value: The study presents a comprehensive view of development of banking from Banking 1.0 to Banking 4.0 along with its relationship with fintech and industry 4.0. Studies undertaken aforementioned were concerned with only one or two dimension of banking 4.0

Key words: Banking 4.0, fintech 4.0, artificial intelligence, industry 4.0 and customer acceptance.

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Introduction:

Banking is one of the vital pillars of our economy. It strengthens our whole financial system and provides a stability in times of crisis. It is evident from the past that our banking system has provided a shield to the economy in case of global slow-down and other financial shocks. Today, we have seen a transformation in our banking system. We have totally changed ourselves from traditional banking format to IoT (internet of things). The technology is changing at a very fast pace and these changes have toppled over the whole traditional branch banking format. These dynamic changes have also produced a revolutionized change in the thought process of customers also. Artificial intelligence, big data, internet, chat bots have resulted in enriched customer experience on one side, but on the other side a lack of personal touch has also been experienced. Here, trust and security emerges as the prime concern in the minds of customer which can hinder the growth path of technology (Liao and Cheng, 2002).

The widespread acceptance of digital payment methods in the nation sustained the Reserve Bank's efforts to create a society where less cash is used. The Bank concentrated its efforts on safety and security of digital transactions in an era of expanding electronic payment systems. In order to ensure the seamless operation of the crucial and systemically significant payment and settlement systems in the nation, the Bank endeavoured to develop a strong and resilient technology platform. (RBI, 2018)

The technology has drastically improved the face of the banking industry all over the world (Kirakosyan and Danaiaata, 2014). Banking industry is experimenting on every front from operational procedure to customer interface and producing successful results in all the experiments (Malik and Dangi, 2021). The whole financial system is benefiting from the

technological orientation and its results are proving themselves every day. The major advantages of technological advancements can be successfully seen in enhanced productivity, new and improved version of services, real time information sharing, efficient risk assessment and management and hassles-free transactions and improved security.

With the advent of technology, customer needs have also been changed and dealing with that has become a major challenge for banking industry. Banks have developed improved internet banking apps/ mobile to address the distinct needs of on line banking users (Gera et al, 2020). Here, it is notable that a major mass of banks customer base is constituted by youth and middle-aged people. Especially in India, which is predominately a youth country. This section of population is ready to learn and try new things, ideas and processes. Young individuals are more attuned to using advanced internet-related technologies. As a result, younger individuals are more engaged in using the newest technology platforms for their daily requirements than older individuals (McMillan and Morrison, 2006). Furthermore, males are more inclined to use internet banking than females (Akinci et al., 2004). The aspirations and expectations of this youth can't be met with older framework of banking system. Here, the prevalent pull technique of marketing plays an important role, where the customer themselves has compelled the administrators, to supply new technologies to meet their new-fangled demands. In light of this need, banks are also experimenting with their processes and producing tailor-based services. Another popular marketing technique which works here is blue ocean strategy resultant to which today banks are trying new dimensions of banking models instead of competing on traditional bank branch business.

Global competition and markets has intensified the customer interest in technology and the last decade especially after COVID pandemic has upsurged the application of technology in banking industry (Paul, 2020). COVID-19 has further added to the concerns of the customers. During the pandemic, the personal concern of transmission of viruses because of physical exchange of cash and long queues in banks have increased. After that, the frightened customers were compelled to shift to online banking for daily needs in case of paying bills, transferring money, purchasing groceries and shopping. (Joshi and Dabas, 2022).

Need of Banking 4.0:-

An efficient and solid banking system is the prerequisite for sustainable development. A stable and strong banking system provides a safeguard to the whole economy. But, change is inevitable, and due to constant changes in technology and regulatory framework, banking system goes through a series of transformation continuously. It is positively hoped that by improving the level of technology and customized services, they will be able to better cater the needs of the customers in an effective manner. Technology brings greater transparency and ensures better customer experiences. In addition to that, from time to time world's financial system make changes in the technology and structure of banking and financial system. In order to comply with these every year banks spend a large portion of their incomes in these compliances and upgrading the infrastructure of the banking system. Thus, international financial system creates an indirect compulsion of adoption of new tools and technology in the banking system. It is the need of the hour to design a user-friendly interface to offer functionality and ease of use so that customers can easily find the required information complete the transaction. (Chandel and Vij, 2019). Comprehensive

online banking products and services quality, online customer service quality and information system significantly affect customer satisfaction (Baskar and Ramesh, 2010).

Customers using online services tend towards various products and services to fulfill their diverse needs. A competitive product portfolio is the most critical and crucial factor in satisfying customers and generating sales (Lohse and Spiller, 1998). Product differentiation and customization of services are needed to achieve a competitive advantage (Madu and Madu, 2002). Introducing a new array of services and products and customizing them in accordance with the customers' changing needs and developments in the market helps satisfy customers. Customers are more inclined towards internet banking when they identify it as a reliable and trustworthy network to get services (Sharif & Raza, 2017)

Second, main factors of technological development in banking is the change in customer needs and preferences. Today, customers are very demanding, they want better customer experience at low cost and very fast speed. Specially, after COVID-19 era, everyone becomes familiar with the use of technology and become habitual of doing financial transactions via online platforms. This directly upsurge, the adoption of modern techniques in banking. As per TRAI, 2019, India is a home to 560m internet subscribers and 1.15b of mobile phone users, which is ranked second after china. The average consumption of cellular data of an individual is 8.3 GB per month which is just two steps behind (China and South Korea) from becoming a topper. This implies a huge potential customer base ready for the digital banking and financial system. Another main reason behind adoption of technology is availability of low priced smartphones and lower internet charges has directly helped the banking to penetration of mobile apps even in lower

income segment groups (Chadha et. al, 2020). In addition to that, digitalization efforts made by government to boost the technology into the veins of economy for overall development has pumped the adoption the different channels of digital banking and use of mobile application for banking business. Indian government has tried to reach citizens in deprived segments and bring the bottom layers of the pyramid under the coverage of digital benefits. (Raj and Aithal, 2018)

Development of Technology along with four generations of banking:-

The revolution of internet has changed the whole operational processing of banking and now banking has entered in a new of technology, which is popularly known as banking 4.0 (Malik and Dangi, 2021). The whole process of transformation of banking is very complex and has a long hauled history. These transformations can be traced back in 1980s before the advent of technology and internet. In this section, technological development process of banking is studied into four phases for a better understanding, viz.- Banking 1.0, 2.0, 3.0 and 4.0.

Banking 1.0, the first generation of banking deals with the traditional banking where financial mediators plays a crucial role in the banking system. They mainly serves as a channel of exchange. This era of banking also suffers from several limitation, viz.- delay in processing, long-queues, inaccessibility of financial services to a common man, decentralization of transactions, maintenance and security issues, documentation and paper work, etc.

The loopholes in banking 1.0 clears the path for banking 2.0, and with the advent of internet, the second generation of banking begins its glorious phase. This era starts from 1980s and lasts upto 2007 just before the starts of global slowdown. Here, we have seen a upsurge of ATMs, off-shore banking, start of online banking and cash-less transactions. Here, the banking system have spent a lot on technological developments but due to unwillingness of customers to adopt a new system created a bottleneck.

Then comes the banking 3.0, which is the era of portable banking or banking in hands or mobiles. Till now, banking customers have become habitual of using technology and they don't hesitate to do online fund transfers. Mobile banking services and customer centric banking are to the key features of this era. This era lasts from 2007 to 2015.

Presently, we are witnessing the banking 4.0, an era of evolution of computing, artificial intelligence, big data sharing, cloud computing, etc. which have all together transformed the whole banking system. After 2015 onwards and specially after COVID-19, everyone has accepted that these technological transformations have become an integral part of our lives and it will live with us forever. The pandemic has taught even a financial illiterate person to do online money transfer and to avail basic facilities of banking. The diagram given below clearly depicts the changing phase of banking from traditional to modern digital revolutionary banking:-

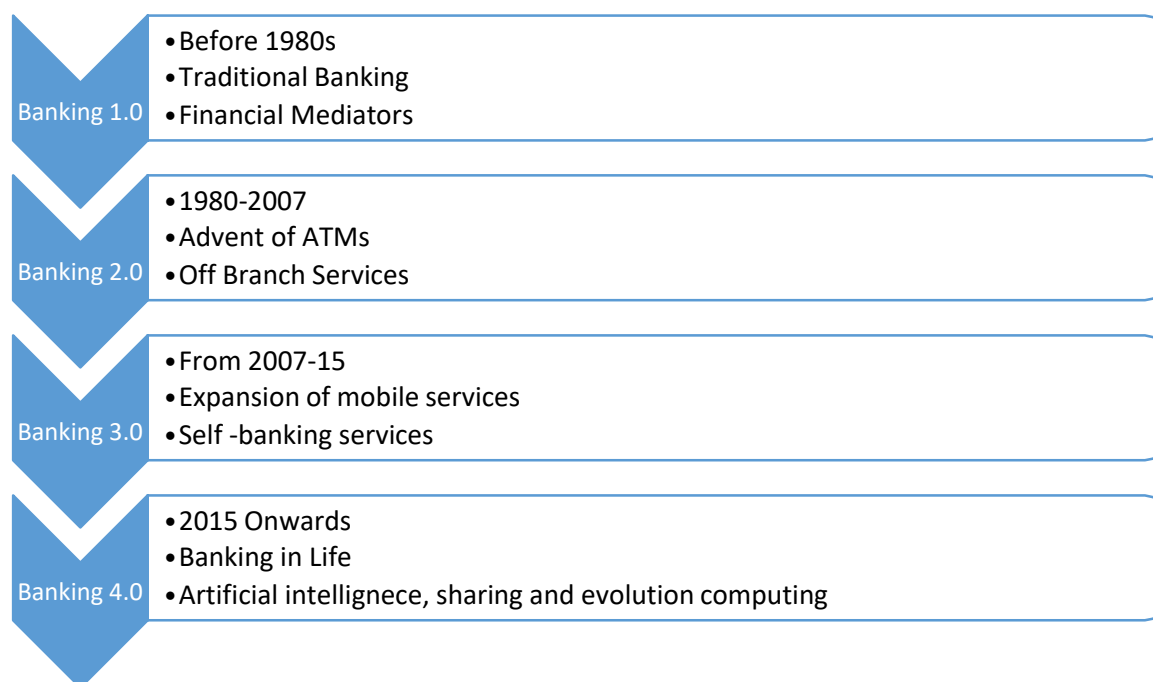


Figure-1 Development of technology in banking under different generations

(Source: Authors' own)

Fintech 4.0-Banking 4.0:-

Fintech refers to the application of technology to new and enhanced financial services. India is the one of the fastest growing fintech market in the world with a count of more than 2000 fintech startups in the country. Out of total 27,000 startups, we are having more than 2000 fintech which shows the upsurge in the growth of fintech in India (ET, 2023). Before 1990, we were having only 16 fintech firms, but it has witnessed a very high growth in fintech especially after 2008. The sector has witnessed a sporadic growth in the recent years and received a total funding of \$ 9.8 Bn in 2021 (IBEF,2023). The reason behind the upsurge growth in fintech is backed by the potential threat created by fintech to traditional financial intermediaries. Use of competitive technology by new entrants and competitive landscape has posed a serious threat to present banking system. Actually, there is very blurred boundary between banks and fintech and other services and because of that it becomes difficult to measure the size of actual fintech business. The size of fintech is difficult to ascertain

because of its varying definitions. As suggested by various researchers, fintech includes technology assisted products provided by banks i.e. online lending (Buchak, Matvos, Piskorski and Seru, 2018). According to this definition, it becomes difficult to classify the online lending services as banking or fintech services. But, the contribution and growth of fintech in economic development can't be overlooked and it is definitely playing an important role in IBEF.

Industry 4.0 and Banking 4.0:

The fourth industrial revolution produced a wholly new economy—the digital economy—by bringing about fundamental and necessary changes (Lazarevic and Durickovic, 2018). Presently, we are in the era of fourth industrial revolution, popularly known as industry 4.0., where technological innovation and digitization are fundamentally altering and transforming workplaces and human connections. The boundaries between the physical and digital world are dissolving at a very fast speed. Our workplaces and organizations are becoming “smarter” and more efficient as machines and humans are

coming to work together. Industry 4.0, the new generation industry is totally different from its past. The time has flown away when we use to study the industry revolution. Today, the scope of industry in enlarged to global level and we can see a radical change in marketing and segmentation. Because of the development of maturity of emerging technologies, innovations are coming from every dimension of industry. Industries are focusing more on creating customised and quality products to cater the needs of the different types of customers. In light of this need, banks are also focusing on offering new and developed products that

are highly technical in nature to meet the industry demands.

Banking's fourth generation is working to strike a balance with industry 4.0. Different generations of banking require the banks to give digital acceptance, blockchain technology, cloud technology, sophisticated robotics, virtual reality, and the exponential development of new technologies and inventions. In order to meet the industry demands, today, banks can't rely on offering one type of banking, they need to offer a variety of services to meet the different needs of the customer (i.e. industry).

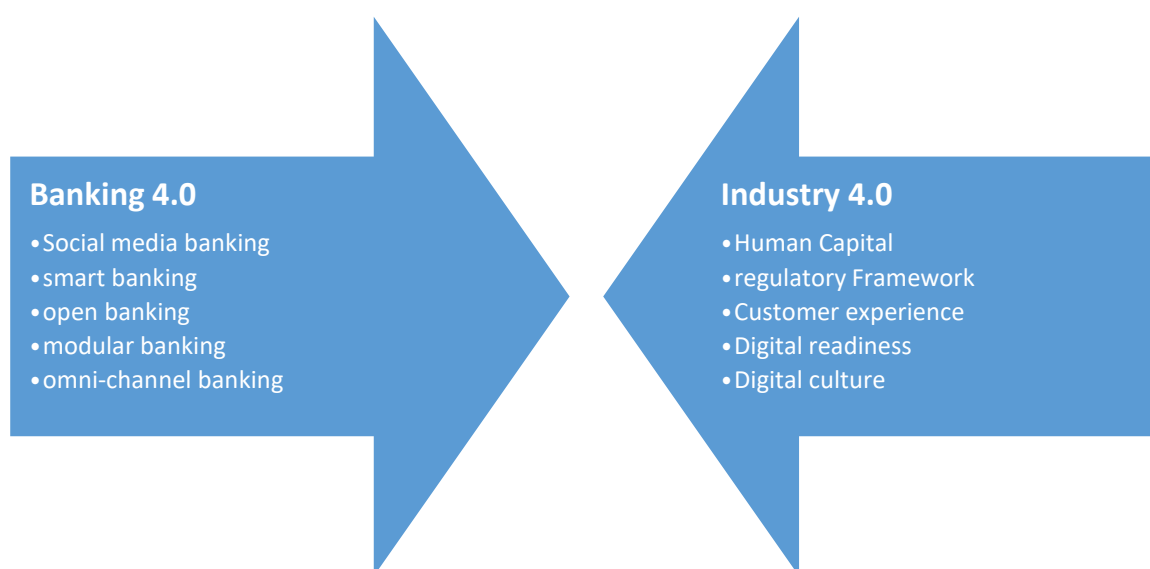


Figure- 2 (Relationship between banking 4.0 and Industry 4.0)

(Source: Authors' own)

The constant development of technology is giving financial organisations the chance to grow and introduce new products. The Fourth Industrial Revolution should be introduced to the digital acceptance and readiness program, human capital, digital culture, regulatory framework, technology, and networking. Digital marketing maturity evaluation and IT governance plan are two of fourth-generation banking's primary objectives.

Today, the industries are experiencing exciting things everyday change in process and system, emergence of technology in every field has changed our traditional way of doing businesses. In order to improve our customer experience, banks and payment services needs to form a system of networks of intelligence. Because, today the customers preference for convenience, quality services, 24X7 availability of services has increased, which has led to reduction in physical barriers. Here, the banking industry is

affected by two main factors, i.e. business development and technological development. And it becomes very crucial for banks to strike a balance in both the fronts and also to maintain customer satisfaction.

In case of business development, fintech and start-ups are using competitive strategy and giving a tuff competition and in the technical sector the blockchains, robotics, IT governance, digital marketing and global regulatory standards are challenging the banks.

Robotics is also revolutionizing the traditional way of banking and financial services. Today, banks are using RPA (Robotics Process Automation) in their day to day functions. It helps in reducing the burden of employees and fasten up the processing system. It ensures greater transparency, reduction in cost and time. Their best utilization proven in routing nature tasks and banks can use their human resources in other important cognitive and managerial tasks.

Technological developments in Banking:-

Technology in banking has found a broader meaning day by day and now plays its role as a disruptor of order in

Table-1 (Customer centred services offered under model Banking 4.0)

Drive thru Banking	It enables banking transactions to be completed while still in the car.
Bank Stations	It provides self-service terminals that give customers access to a variety of value-based e-services.
Passbook Updation Kiosks	It provides a service that enables users to print their own passbooks.
Chatbot	The front-desk environments at banks will soon be replaced by the intelligent banking assistant.
Cash Deposit Machines	Cash can be deposited by consumers alone at self-service terminals without the assistance of bank staff.
ATMs and AI	ATMs are the by-product of second generation of banking, but presently AI has advanced ATMs in the segments like- cyber security, ATM cameras, forecasting cash demand and improved customer experience.

various parts of the financial and monetary system, including micro payments, money transfer, lending, comparison and online sales of various types of insurance policies, capital increase, and asset management. The adoption of technology in banking sector has geared up chiefly after 2011, when the GAF A (Google, Apple, Facebook and Amazon) group has presented a prospective competition for banks by showing their intention to be in part of providing payment services (PSD) (Bosko, 2019).

The adoption of technology in banking sector is very transformational and innovative. The banks are using different AI algorithms in order to enhance customer experience and maximisation of profits. The adoption of technology in banking has covered all areas of banking operation from algorithm monitoring to facial detection, artificial intelligence, block chain and cloud computing (Jewandah, 2018). Everywhere we have witnessed that AI is entering into a boom stage and banking sector shows no exception to that (Kashiwagi, 2005).

The major adoption of technology in banking can be seen in the specialised services offered by banks given below:-

Mobile Banking	Money transfers on a regular basis have become much more convenient thanks to mobile banking, especially after COVID-19. Mobile apps are also very good at satisfying customer needs.
Blockchain Technology	It offers the distributed, decentralized and digital ledger which determines the future of crypto banking, record keeping, loan management, enhanced transparency, etc.
Fraud Detection	Technology sets the rules and observes the pattern and helps in timely detection of frauds.

(Source: Authors' own)

In fact, technology in banking is playing a double edged sword in banking growth and development. On one side banks are investing a huge funds in new technological up gradation and meeting the global compliances which will definitely resultant in additional revenues to the

banks, but on the other side the funds invested in these puts an additional cost burden on banks. In addition to that, the following listed are the advantages and disadvantages offered by technological adoption in banking industry.

Table- 2 (Advantages and Disadvantages of Technology in Banking)

Advantages	Disadvantages
Improvement in efficiency, speed and agility	Dismissal of the labour force in the banking sector
Reduction in operational costs	Trust issues by the clients
Cheaper customer transactions	Security concerns by the clients
Increased rate of transactions	Security concerns by the banks
New and customised services	Closing of bank branches
Tracking of pattern of customers	Business and cyber risks
Winning in new customer segments	

(Source: Authors' own)

The above table clearly depicts the advantages and disadvantages of adoption of technology in banking industry. The advantages of technology definitely pushes the banking sector to adopt and try different models of technology, but disadvantages creates a bottleneck to the whole transformation process. But, by bringing following changes in the system and customer mindset will definitely help in improving the whole process of digitalization in banking sector:-

1. Financial literacy is the pre-requisite for digitization, thus first we need to ensure the financial literacy among our people in order to ensure the successful implementation of technology in banking.

2. Gray economy is posing a very challenge to banking industry, so it needs to be curbed effectively.

3. The trust issues needs to be dealt very cautiously and we should also provide some time to the customers to accept any new technology.

4. High cost of investment at the beginning stage is automatically overcome by the returns generation.

5. We should also pay respect to client's habit and give due time to customers to change themselves in context of the changing banking service system. (Especially the traditional clients and the elderly population)

6. Proper training of the employees can be arranged before the systematic planning and implementation any new technology. It will help in enhancing peoples' acceptance of technology in banking.

7. Proper planning and implementation of plans should be ensured by the authorities.

Analysis and Interpretation:-

The present study has made an attempt to analyse the customer's acceptance towards technological developments in banking sector. The study was conducted on 236 customers of different banks in the Delhi-NCR region. Out of 236 respondents, 132 reported their age below 40 years and rest 104 reported their age above 40 years. The analysis of the study found that most of the respondents are in favour of technological up gradation in banking sector, but a comparative analysis between the two groups clearly reveals that, the young adults have significantly higher acceptance level of technology adoption in banking services. They are ready to try new products which are customised according to their needs, provides convince, low cost of transactions and quick services. While their counterparts, have shown a little reluctance in their behaviour in case of technology adoption is because of their traditional banking habits and lack of personal touch in new product offerings.

One rising trend can be seen in adoption of mobile banking, all the respondents have shown a significant favourable attitude towards adoption and use of mobile banking because of ease of use, 24X7 availability and multiple services offered by mobile banking. 98% respondents have reported that they have downloaded the banks specific apps from either play store and other sources and using them effectively. One of the top downloading platforms, google play store also reports more than 10 Crore and above downloads in case of SBI YONO (SBI) and 1 Crore and above in case of iMobile Pay (ICICI Bank) (Google Play, 2023). This clearly

shows the usage of mobile banking among customers.

The feature of speed and agility in services because of adoption of technological adoption is also appreciated by all (100%) the respondents. While the customers significantly differs in context of security and trust issue. Here, again people above the age of 40 years are little cautious and significantly differs from their counterparts regarding the security and trust issues. The main reason behind this difference in opinions is because with the rise in age and income people used to get more cautious and need a safety assurance while in the young age we generally pay a little attention to these essential areas of life. Security is also found among the primary concern for customers on internet-based electronic banking transactions as it includes colossal money value transfers led among an open network (Liao & Cheug, 2002 and Chien-Ta Ho and Oh, 2009).

Discussions:

India recorded the largest volume of digital transactions. In 2021, we India reported a record of 48 Bn real time transactions, which is 6.5 times of the combined volume of the world's five leading economies. Banking 4.0 is also creating a roadmap for industry 4.0 and fintech provides a support system to that. Technology has empowered banks, fintech and other non-traditional banking companies to create a base for the smooth development and functioning of Industry 4.0. Presently, we have 23 fintech firms which have gained the 'Unicorn status' and the market valuation of these firms is reported to be more than \$ 1 Bn (ET,2022).

We have seen an upsurge growth in the use of digital transactions. Our digital payment system is at a turning point, consumers has shown an increasing trend towards the use of digital payment channel. India's digital payments market will more than triple from \$3 trillion to

\$10 trillion by 2026 (ET, 2023). It will also help in cost and time saving of the consumers. Customer needs are changing, we are experiencing new things daily and all this is contributing towards the growth and development of banking and financial sector. Everywhere we have seen an up gradation in banking system and financial services sector, but in addition to these advantages some problems also exist in the system.

The advantages of technology adoption clearly abolish the problems caused by the adoption of technology and in addition to that a complete systematic approach of technology adoption will definitely produce better results. Consumer and employees of banking sector are the main proponents in this whole transformation process and by bringing a positive change in their mindset towards technology adoption will result in effective utilization of technology in banking.

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