



# A STUDY ON TECHNOLOGY BASED DRIVEN SERVICE STRATEGY

**\*SIRAJBASHA R**

**Assistant Professor, Department of Studies and Research in  
Management, KSOU Mukthagangothri-Mysore**

## **Abstract**

*This paper attempts to study how technologies are drastically changing the banking and capital markets industry in the front, middle, and back office. Also the role AI and automation are playing in changing course of banking. The balanced approach followed by Indian central bank, Reserve Bank of India, is a major factor in any new technology adoption in Indian banking sector. In the last few years—especially during the governorship of Raghuram Rajan and his successor Urjit Patel—RBI has taken a cautious but pragmatic view of embracing new technologies, often forcing technology adoption on banks through regulation, wherever it has seen scope to enhance customer experience and efficiency using a particular technology. RBI's proactive push of new technology adoption has not just been restricted to creating policy frameworks. It has used a mix of regulation, evangelism and even worked with the industry to make things easier and effective. The creation of National Payment Corporation of India (NPCI) which has significantly brought down the cost of electronic transactions is a case in point. The regulator also has an academic/research unit, Institute of Development and Research in Banking Technology (IDRBT) which keeps studying the opportunities and challenges in new technology areas. It is not a coincidence that both these units have been actively involved in testing out block chain as a proof of concept.*

*India's position is quite unique here. It is a fact that India is a tech-hub. Apart from being a large technology outsourcing destination, India is also the home to vendors with a large core banking market share globally. Two of the top three core banking solution vendors—Infosys and TCS—are headquartered in India. Of late, India has also seen a lot of activity in the fintech arena. The country has become one of the global fintech hubs. While in many developed markets, fintechs and banks have enjoyed an uneasy relationship, in India, most progressive banks like ICICI Bank, Axis Bank and HDFC Bank have proactively gone to fintechs, creating contests and hackathons to get the best of innovations, sometimes even sharing their APIs with these fintechs. Bank Chain was announced on 8 February 2017 by SBI, India's largest bank. It's a 30+ member consortium led by SBI, the country's largest lender, and includes banks, NBFCs and the National Payments Corporation of India (NPCI), an organization set up by Indian banks to support retail payments.*

**Key words:** banking, computerization, fintechs, technology, National Payments Corporation of India

## I. INTRODUCTION

The need for computerization was felt in the Indian banking sector in late 1980s, in order to improve the customer service, book-keeping and MIS reporting. In 1988, Reserve Bank of India set up a Committee on computerization in banks headed by Dr. C. Rangarajan. Banks began using Information Technology initially with the introduction of standalone PCs and migrated to Local Area Network (LAN) connectivity. With further advancement, banks adopted the Core Banking platform. Thus branch banking changed to bank banking. Core Banking Solution (CBS) enabled banks to increase the comfort feature to the customers as a promising step towards enhancing customer convenience through Anywhere and Anytime Banking. Different Core Banking platforms such as Finacle designed by Infosys, BaNCS by TCS, FLEXCUBE by i-flex, gained popularity. The process of Computerization gained pace with the opening of the economy in 1991-92. A major driver for this change was propelled by rising competition from private and foreign banks. Several commercial banks started moving towards digital customer Services to remain competitive and relevant in the race.

Banks have benefitted in several ways by adopting newer technologies. E-banking has resulted in reducing costs drastically and has helped generate revenue through various channels. As per last available information, the cost of a bank transaction on Branch Banking is estimated to be in a range of Rs.70 to Rs.75 while it is around Rs.15 to Rs.16 on ATM, Rs.2 or less on Online Banking and Rs.1 or less on Mobile Banking. The number of customer base has also increased because of the convenience in 'Anywhere Banking'. Digitization has reduced human error. It is possible to access and analyze the data anytime enabling a strong reporting system.

RBI has been a guiding force for the banks in forming regulations and giving recommendations to achieve various objectives. Commercial Banks in India have moved towards technology by way of Bank Mechanization and Automation with the introduction to MICR based cheque processing, Electronic Funds transfer, Inter-connectivity among bank Branches and implementation of ATM (Automated Teller Machine) Channel have resulted in the convenience of Anytime banking. Strong initiatives have been taken by the Reserve Bank of India in strengthening the Payment and Settlement systems in banks. The banking industry then migrated to LAN (Local Area Network) connectivity. Later, they graduated to core banking platform where their core banking solutions helped in increasing the comfort factor for customers with 'anytime, anywhere' banking. Today, they are totally focused on 'Digital Transformation' deploying high-tech technological solutions for increasing revenue, optimizing cost structure, enhancing the customer service experience, and managing enterprise risk. In December 2015, RBI's Financial Stability Report went all out for blockchain. Devoting a full section to blockchain titled 'Implications of disruptions – Blockchain technology', it said, "Regulators and authorities need to keep pace with developments as many of the world's largest banks are said to be supporting a joint effort for setting up of 'private blockchain' and building an industry-wide platform for standardizing the use of the technology, which has the potential to transform the functioning of the back offices of banks, increase the speed and cost efficiency in payment systems and trade finance."

Some instances of this include ICICI Bank announcing a successful completion of pilot transactions via its blockchain network with Emirates NBD on a custom-made blockchain application, co-created with EdgeVerve Systems, a wholly owned subsidiary of Infosys in October 2016. Similarly, Axis Bank, India's third-largest private sector bank, launched instant international payment services using Ripple's enterprise blockchain technology solution, in Nov last year.

Similarly, RBS Bank (global) has been diligently exploring a number of projects testing use cases for Distributed Ledger Technology (DLT), including research into blockchain based clearing systems and innovations in international payments/foreign exchange. RBS is also one of the founding members of the R3 blockchain partnership.

That means almost all four of the top private banks in India are going deep into blockchain trials and implementation. In short, India is today a vibrant powerhouse of fintech. That will—and the early signs only confirm the trend—impact blockchain trials, rollout and deployment in a unique manner in India, making it a global learning testbed.

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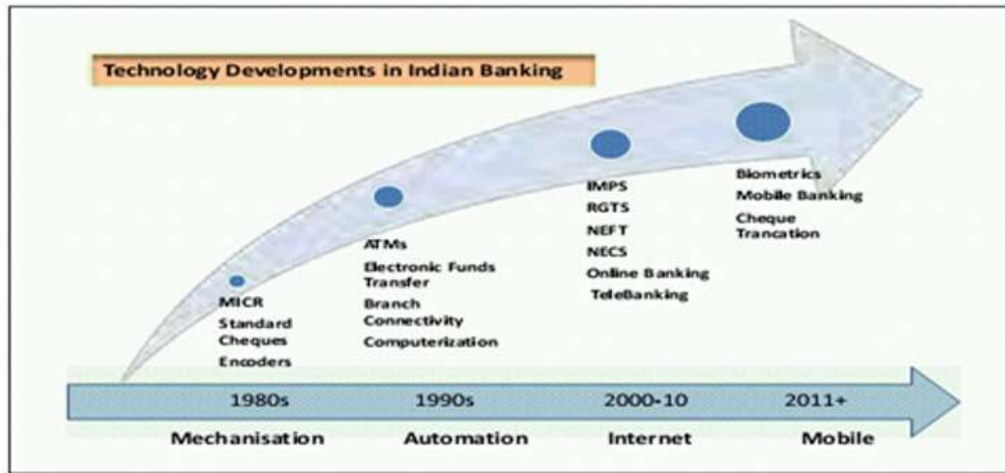
## II. OBJECTIVE OF THE STUDY

This paper intends to explore and analyze latest **technology driven banking** paradigm and how adoption **cloud-based technology** benefits banking ecosystem.

## III. EVOLVING TECHNOLOGY LANDSCAPE IN BANKING SECTOR

Once technology started permeating into the banking sector, banks brought about a change in their operations. They moved towards universal banking offering alternate working channels like smart cards, internet banking, mobile banking, and ATMs. They also started deploying HRM (Human Resource Management), process re-engineering, ERP management etc. to enhance their productivity and improve performance. Today, major emphasis is on paperless and cashless payment modes, which are made possible only because of technology.

Snapshot of Technology Developments in the Indian Banking Sector:



The efforts put in by the banking industry as well as the government are paying off and the non-cash payments are picking up. Internet users are also going up both in urban and rural areas, which is helping internet banking. While efforts are on in the Indian subcontinent to enhance the core banking values and revamp the digital-first plans, Singapore has become a test bed in Asia for the use of new technology. Financial regulators and the government are working in tandem to take concrete steps to support innovation in the banking sector.

More and more people are motivated to use internet banking rather than visiting the branches. With the deep penetration of internet among the Indian population, this change is quite evident. India is a young nation with the country's average age becoming 29 years by 2020. This young generation is very tech savvy and looks towards the internet for all their queries and information requirements. Thus, it is extremely important that the Indian banks work towards implementing a class-leading internet banking facility.

#### IV. A MAJOR TRANSFORMATION IN THE BANKING INDUSTRY

The banking sector of India is undergoing a vast transformation. There are new players in the arena and this has made the game much more competitive. To stay ahead of others, one needs to adopt BI (Business Intelligence) and analytics. It not only helps in driving their profitability, it also increases control and transparency over banking business. In case of Indian banks, the ADF (Automated Data Flow) initiative has helped in submitting consistent and correct data between banks and RBI without the possibility of any kind of manual intervention.

When we talk about major transformations in the banking industry, Virtual Assistants (VAs) deserve a special mention. VAs are changing the way in which customers communicate with banks. Many banks are integrating VAs as a core part of their technologies so that they can respond quickly to simple customer queries. Readers who find it hard to believe that VAs can do a lot of wonders for the banking industry can check out this white paper, which gives a brief insight into the multi-fold benefits of [virtual assistant](#) for enterprises.

Technology can also be used in risk management, information security and for better customer management. These technological advancements and innovations are leading to an era of reforms and liberalization in the banking industry and are bringing about a positive change in the sector in a big way.

Embracing futuristic technologies has gained significant momentum across the banking and financial sector as well. Streamlining services for the customers along with system upgrades in terms of tech deployments are rapidly gaining acceptance. The banking industry in India is geared up for a transformational space with the implementation of advanced technologies such as applications of Artificial Intelligence (AI), Machine Learning (ML), BlockChain and Robotics.

- **Robotic Process Automation:** The volume of unstructured data that the banks have to process is growing exponentially with the rise of the digital economy. These are not just banking transaction data, but also other behavioral data that could allow banks to improve and innovate the customer experience. With a combination of various technologies that enable cognitive and robotic process automation bankers can now understand customer action and make a judgment at a higher speed, scale, and quality. Additionally, smart virtual assistants today are handling transactions, providing important information, and helping customers. Robotic Process Automation is improving the user experience by allowing bots to handle repetitive tasks without human intervention. It also reduces errors and enables bank staff members to handle more intricate queries and provide better customer service.
- **Data Analytics:** Today, success is achieved by driving intelligent customer engagement based on a data-driven understanding of the business. Technology and digitization have transformed the BFSI sector by enabling them with real-time actionable insights to make informed decisions, creating competitive advantages and elevating consumer experience. This also allows banks to share potential products, upsells, cross-sells, and strategic planning with customers. With AI-backed models, the ability to transform the banking experiences of customers is truly exponential.
- **API Platforms:** Today, through API platforms, banks are working with Fintechs to build banking stacks that allow them to be a platform on which customers and third-party service providers can connect to deliver flexible and personalized experiences to the end-user. API Banking Platform is designed to work through APIs that sit between the banks' backend execution and front-end experiences provided by either the bank itself or third-party partners. This allows the banks to adopt completely new business models and use cases such as enabling salary advances and experiment with new technologies like blockchain at low cost. APIs also help banks to future-proof their systems.
- **Cyber Security:** Banking industry deals with sensitive & personal information, which has made it an attractive target for cybercriminals. With the deployment of technology in the BFSI sector, cyber risk is also evolving. The banks are becoming agile in the way they approach cybersecurity. They are gradually implementing advanced analytic, real-time monitoring and biometrics and behavioral analysis software to detect threats and stop them from disrupting the systems. They are also utilizing anti-hacking tools which provide network-level security which looks for unusual behaviors and potential cyberattacks.
- **Cloud Computing:** Another technological advancement that is revolutionizing the banking industry is cloud computing. Cloud is a crucial tool of the service delivery model and enables banks to penetrate new business opportunities and access new delivery channels. By leveraging cloud-based services, banks can decrease data

storage costs by saving on capital and operating expenditure, while ensuring customer data is protected.

Cloud computing also promotes safe online payments, digital money transfers, wallets payments, etc.

With the introduction of new technologies, the banking industry has changed tremendously over the years. Now, the banking processes are much faster and reliable which has led to improved customer relationship with banks. For instance, Mastercard Advisors, the data analytics and insights arm of Mastercard, distill experience and knowledge from thousands of real-world engagements with financial institutions to generate valuable strategies across Consumer, Commercial, Debit, Credit, Marketing, Acquiring, Risk and Fraud.

## V. THE FUTURE UPCOMING TECHNOLOGIES

In last few years, the Indian banking sector has realised the need of digital technologies and is rapidly moving to embrace digital banking. They are making considerable investment in creating digital infrastructure in order to offer various solutions like mobile banking, e-wallets and virtual cards, etc. The key innovations in Digital banking are Digital-only/Virtual Banking, Biometric Technology, Artificial Intelligence, Blockchain Technology, Bitcoin and Robotics to mention few.

Digital-only bank provides end-to-end services through digital platforms like mobile, tablets and internet. It is paperless, branchless and signature-less banking offering 24\*7 services to its customers. In India, the digital-only banking is based on Aadhaar infrastructure. The digital-only banks offer various services like account opening, term deposits, loans as well as financial products like insurance and mutual fund. While digital banking is simple and cost effective, there are still security risks. The pace of growth in digital-only banks will depend on their ability to address security concerns. Innovations like Biometric technology allows the person to be identified uniquely by evaluating one or more distinguishing biological traits like face, hand, retina, voice and ear features. The use of biometric authentication can eliminate the requirement of multiple passwords and PIN codes. The Indian banking sector is also gradually adopting biometric authentication to provide simple and secure banking experience to its customers.

Artificial Intelligence (AI) can provide quick and personalized services by dealing with each customer and focusing on their specific requirements. It can be used to collect information, automatically build models based on that information, inference and communicate in natural way. In India, only large banks are currently seeking to introduce AI in their services. The key components of AI are machine learning, computer vision, natural language progression and natural language generation. Indian banks are likely to use AI like machine learning to re-engineer back office processes. Robotics is a technology that mimics the actions of human performing simple rule-based processes. The use of robotics in the Indian banking sector though not yet widespread, is expected to gain ground in the coming years. Robotics is expected to automate processes which are repetitive, rule based and require less human judgement. Also, being scalable and cost effective, it could help automate processes with high transaction volumes. Presently, some Indian banks have started deploying robots to answer customer queries related to banking transactions, demat account, locker facility, fixed deposit, loan, etc. Apart from humanoid robots providing customer service, software

robots are also getting deployed in functions such as retail banking operations, agri-business, trade & forex, treasury and human resource management to name a few.

Globally, banks are seeking to use block chain technology (BCT) for operations such as money transfer, record keeping and other back-end functions. Block chain technology can be used in banking activities like secure document management, reporting, payments, treasury & securities and trade finance. Banking industry can benefit from block chain technology as it helps in fraud prevention, increasing the resilience of the bank's IT infrastructure and also increases transparency of processes. Besides these advantages BCT is also cost efficient and provides auditability & provenance. Bitcoin is the decentralised digital currency as well as the decentralized peer-to-peer payment network that is powered by its users with no central authority. In India, the RBI hasn't yet authorized use of bitcoins and issued a press release on Feb 1, 2017, cautioning the users, holders and traders of bitcoins about the potential financial, operational, legal, customer protection and security.

## VI. CONCLUSION

Banks are focused on tailoring their products and services according to the requirements of individuals and, as a result, providing them with highly personalized experiences. This practice helps them to engage and retain customers. They are also trying to enhance their current processes to increase banking productivity and customer satisfaction. The world has entered what some regard as an era of 'Digital Darwinism', a time where technology and society are evolving faster than many organisations can adapt to the changes. The emergence of the digital five forces - Social, Mobile, Analytics, Cloud and Internet of Things (IoT) - is creating new and valuable sources of business information, ways to interpret data and the means to do so cost-effectively.

With rapid development in technology, businesses all over the world are getting disrupted. Banks realized a long time ago that they need to continuously invest in technology to remain relevant in this age. There are many more innovations taking place in banking technology and the ones mentioned here are just the general trends that most of the banks are employing, in order to have the most effect on banking revenues in the coming decade.

## VII. REFERENCES

1. Fred Gottheil (1 January 2013). Principles of Economics. Cengage Learning. p. 417. ISBN 978-1-133-96206-9. Retrieved 11 January 2015.
2. Santosh Kumar Das (1980). The economic history of ancient India. Cosmo Publications. pp. 229–. ISBN 978-81-307-0423-4.
3. Chris A. Gregory (1997). Savage Money: The Anthropology and Politics of Commodity Exchange. Taylor & Francis. p. 212. ISBN 978-90-5702-091-9. Retrieved 11 January 2015.
4. Md. Aquique (1974). Economic History of Mithila. Abhinav Publications. p. 157. ISBN 978-81-7017-004-4. Retrieved 12 January 2015.
5. "Evolution of Payment Systems in India". Reserve Bank of India. 12 December 1998. Archived from the original on 1 May 2011.

6. Kling, Blair B. (1976), "The Fall of the Union Bank", Partner in Empire: Dwarkanath Tagore and the Age of Enterprise in Eastern India, University of California Press, p. 198, ISBN 9780520029279
7. Cooke, Charles Northcote (1863) The rise, progress, and present condition of banking in India. (Printed by P.M. Cranenburgh, Bengal Print. Co.), pp.177–200.
8. Shankar's Weekly. 1974. pp. 2, 3. Retrieved 24 August 2017.
9. "Post-War Developments In Banking In India" (PDF). Economic Weekly. Mumbai: Sameeksha Trust: 17–18. 1 January 1949. ISSN 0012-9976. the total number of bank branches registered a three-fold increase
10. "Reserve Bank of India – About Us". Reserve Bank of India. Retrieved 6 September 2019.
11. "Plan for social control of banks". The Hindu. 15 December 2017. ISSN 0971-751X. Retrieved 16 February 2020.
12. Austin, Granville (1999). Working a Democratic Constitution – A History of the Indian Experience. New Delhi: Oxford University Press. pp. 215. ISBN 0-19-565610-5.
13. "From the Archives (July 10, 1969): P.M. wants selective bank take-over". The Hindu. 10 July 2019. ISSN 0971-751X. Retrieved 9 August 2019.
14. "From the Archives (August 5, 1969): Bill on Bank nationalisation". The Hindu. 5 August 2019. ISSN 0971-751X. Retrieved 9 August 2019.
15. Parmatam Parkash Arya; B. B. Tandon (2003). Economic Reforms in India: From First to Second Generation and Beyond. Deep & Deep Publications. pp. 369–. ISBN 978-81-7629-435-5.
16. "The Success of India's Liberalization in 1991". UFM Market Trends. Retrieved 9 September 2021.
17. IndianMoney; IndianMoney. "List Of Private Banks in India | IndianMoney". indianmoney.com. Retrieved 9 September 2021.
18. Ago, Mkdigestin #mgsc • 2 Years (17 April 2019). "Prowess of New Generation tech-savvy Private Banks in India". Steemit. Retrieved 9 September 2021.
19. "Voting rights for foreign shareholders: Centre plans raising ceiling to up to 20 per cent amid cash crunch". The Indian Express. 22 June 2016. Retrieved 11 June 2020.
20. "Bandhan Bank hikes foreign investment limit to 49%". The Economic Times. 4 November 2019. Retrieved 11 June 2020.
21. "Bandhan Bank hikes foreign investment limit to 49%". The Economic Times. Retrieved 9 September 2021.
22. Iyer, Aparna (17 May 2016). "SBI merger: India may soon have a global Top 50 bank". Archived from the original on 30 June 2016. Retrieved 1 July 2016.
23. Saha, Manojit (18 May 2016). "Five associate banks to merge with SBI". The Hindu. Archived from the original on 21 June 2016. Retrieved 1 July 2016.
24. "SBI merges with 5 associates: New entity set to enter world's top 50 banks list". 16 June 2016. Archived from the original on 30 August 2019. Retrieved 30 August 2019.
25. "Cabinet okays merger of associates with SBI". Archived from the original on 30 August 2019. Retrieved 30 August 2019.
26. "Ahead of merger with SBI, associate SBT to raise up to Rs 600 crore". The Economic Times. 18 February 2017. Archived from the original on 19 February 2017. Retrieved 18 February 2017.



27. "Who benefits from merger of SBI, associates?". 20 June 2016. Archived from the original on 30 August 2019. Retrieved 30 August 2019.
28. Gupta, Deepali (11 May 2017). "SBI's merger could see the banking behemoth leapfrogging into the global top 50". The Economic Times. Archived from the original on 30 August 2019. Retrieved 30 August 2019.
29. Prof. Mubarak, "SERVICE QUALITY IN INDIAN BANKING INDUSTRY- A STUDY", International Journal of Creative Research Thoughts (IJCRT), ISSN:2320-2882, Volume.6, Issue3, pp.361-370, July 2018, Available at :<http://www.ijcrt.org/papers/IJCRT1133358.pdf>
30. "Five associate banks, BMB merge with SBI". The Hindu. April 2017. Archived from the original on 1 April 2017. Retrieved 30 August 2019.
31. "Bank of Baroda, Vijaya Bank and Dena Bank to be merged". The Economic Times. 18 September 2018. Retrieved 5 April 2019.
32. "Vijaya Bank, Dena Bank amalgamation with BoB is effective from April 1; here's the share exchange plan". Business Today. Retrieved 14 March 2019.
33. "Bank Merger News: Government unveils mega bank mergers to revive growth from 5-year low". The Times of India. Retrieved 2 April 2020.
34. Staff Writer (30 August 2019). "10 public sector banks to be merged into four". Mint. Retrieved 30 August 2019.
35. "Merged entity of UBI, PNB, OBC to become operational from April 1, 2020". Business Today. Retrieved 14 September 2019.
36. "Merged entity of UBI, PNB, OBC to become operational from 1 April next year". Mint. 14 September 2019. Retrieved 14 September 2019.
37. Indian banking system. I.K. International. 2006. ISBN 81-88237-88-4.
38. Srivastava, Samir K, "Expansion of banking in India", The Economic Times, 7 June 2008, pp. 8 (Available at: <http://m.economictimes.com/PDAET/articleshow/3107960.cms>)