

## Technology Adoption in Indian Banking Sectors - 2023

D. Murugun

School of Business Studies, Hindustan College of Arts and Science, Padur,  
Chennai

**Corresponding Author:** D.Marugan [drmurugan1987@gmail.com](mailto:drmurugan1987@gmail.com)

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### ARTICLE INFO

*Keywords:* Technology in Banking, E-banking, Mobile Banking, Internet Banking

*Received :* 05, December

*Revised :* 12, January

*Accepted:* 25, February

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### ABSTRACT

The Recent Technology in banking has become even more evident in recent years, as phone, online and mobile banking has revolutionize the way we take care of our finances. In fact, one might argue that the impact of technology in the banking sector has meant that we now have no excuse for being overdrawn or not paying credit card bills on time. In previous generations, the only way to find out how much money you had in the bank was to keep a detailed log book or pay a visit to your local branch and ask the teller to check the ledger for you. Then along came the innovation known as the ATM machine, which allowed us to withdraw cash from hundreds of convenient locations and check our balance while we were at it. Nowadays, with mobile banking apps it's possible to check your balance any time any place. So before you splash out on a new stereo or home entertainment system you can check your account then and there just to be sure you can afford it. Another one of the Advantages of technology in banking is that it allows us to pay bills quickly and without physical visit. We can arrange to have them paid by direct debit every month at a time that suits us, or we can make one off transfers as and when the bills come in. This means that there's no longer any need to pay a physical visit to your branch to pay bills and it also means we are more likely to pay them on time. People who find it more difficult to manage their money can arrange for as many bills as possible to be paid just after their salary clears their account so that they know the essentials are covered before they can spend on luxuries. In this paper has been made an attempt on "Technology adoption in Indian Banking Sector.

## INTRODUCTION

### *Historical Perspective*

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.

### *Current status in the Digital Space*

Indian Government is aggressively promoting digital transactions. The launch of United Payments Interface (UPI) and Bharat Interface for Money (BHIM) by National Payments Corporation of India (NPCI) are significant steps for innovation in the Payment Systems domain. UPI is a mobile interface where people can make instant funds transfer between accounts in different banks on the basis of virtual address without mentioning the bank account. Today

banks aim to provide fast, accurate and quality banking experience to their customers. Today, the topmost agenda for all the banks in India is digitization.

#### *Challenges*

- Security Risks - External threats such as hacking, sniffing and spoofing expose banks to security risks. Banks are also exposed to internal risks especially frauds by employees / employees in collusion with customers
- Financial Literacy / Customer Awareness - Lack of knowledge amongst people to use e-banking facilities is the major constraint in India.
- Fear factor - One of the biggest hurdles in online banking is preference to conventional banking method by older generation and mostly people from the rural areas. The fear of losing money in the online transaction is a barrier to usage of e-banking.
- Training - Lack of adequate knowledge and skills is a major deterrent for employees to deal with the innovative and changing technologies in banks. Training at all levels on the changing trends in IT is the requirement of the day for the banks.

#### *Objectives of Technology Adoption in Indian Banking*

1. To study the concept of the adoption of Technology in Indian Banking Sector.
2. To evaluate the Banking Technology Products and Services
3. To examine the RBI initiatives and Technology of banking Services in India

### **THEORETICAL REVIEW**

**Centeno (2004)** argues that speed, the convenience of remote access, 24/7 availability and price incentives are the main motivation factors for the consumers to use internet banking. **Calisir and Gumussoy (2008)** compare the consumer perception of internet banking and other banking channels and report that internet banking, ATM and phone banking substitute each other. **Guerrero et al. (2007)** examine the usage of internet banking by Europeans and their results indicate that ownership of diverse financial products and services, attitude towards finances and trust in the internet as a banking channel influence clients' usage of internet banking. Confirming other papers, **Sohail and Shanmugham (2003)** document accessibility of internet, awareness of e-banking and resistance to change are found to be influencing Malaysians use of internet banking. Another factor that promotes clients usage of internet banking is seller support (**Nilsson, 2007**).

### **METHODOLOGY**

The research paper was used secondary data only. In this secondary data was collected from Text book, news paper, Academic Journal and Internet.

#### *Concept adoption of Banking Technology*

RBI Initiatives in Banking:

**WAN:** Banks often use telecom carriers to provide network management for their WANs. Most telecom carriers offer an option that includes a router for termination of MPLS circuits, Internet access circuits, etc.

Banks use this option because it is the most economical approach to managing their WAN; however, expect minimal support. Carriers typically design simplified support tools to fight fires by focusing on managing the up/down status of the circuits. This reactionary type model offers minimum maintenance. The telecom carriers wait until they are notified of an issue, most frequently by the end user who, themselves, is only aware when they begin experiencing poor performance or downtime.

In most cases these tools simply aren't sophisticated enough to allow for deep inspection of traffic patterns or usage. Even for administrators with enough expertise to keep WAN administration an internal function, these tools should be supplemented to allow for more proactive monitoring. Layering third party software or services on top of the basic telecom-provided greatly enhances this approach to monitoring.

**LAN:** LAN is a small and single-site network. A LAN connects network devices over a relatively short distance. It is a system in which computers are interconnected and the geographical area such as home, office, building, school may be within a building to 1 km. All the terminals are connected to a main computer called SERVER. On most LAN's cables are used to connect the computers. LANs are typically owned, controlled and managed by a single person or organization. They also use certain specific connectivity technologies, primarily Ethernet and Token Ring.

Wireless LAN or WLAN: is a wireless local Area Network that uses radio waves as its carrier. The last link with the users is wireless to give a network connection to all users in the surrounding area.

**VSAT:** As opposed to terrestrial link, satellite connectivity involves use of transponder space on the satellite and communication equipment called Very Small Aperture Terminal (VSAT) at the place being connected for data communication. VSAT is particularly useful in the regions where leased line connectivity cannot be established like hilly areas, ocean, and desert. VSAT technologies ensure link security and reliability. The benefits of VSAT are (i) faster relocation; (ii) quick establishment of new sites; (iii) rapid installation of equipment at the customer's premise with limited infrastructure; (iv) reduced Network implementation time; (v) availability (99.9%) is far better than the availability of ground networks - reliability of data network; (vi) lowest TCO over terrestrial for multistage applications; (vii) highest uptime; (viii) security - VSAT networks are very secure and the ideal option for confidential, business sensitive data transfer; (ix) bandwidth on demand - the bandwidth channels can be regulated Independence from earth networks and infrastructure; and (x) reduced operational cost.

### *Networking System:*

**Single window Concept:** A single window is a system where all facilities are available in one place. For example, in banking there are various dealings like withdrawing cash from a savings account, current account, purchase of drafts or pay orders, making fixed deposits, etc. Earlier, for each type of transaction, a customer had to approach staff at different counters. Today all facilities are available at one counter is called single window concept:

### *Bank branch Networking application:*

**Intranet Banking:** A bank intranet is an essential tool, which helps staff better collaborate, engage and involve staff, promoting your culture and company values along the way. It also gives your employees the tools they need to perform their jobs efficiently.

### *Employee Profiles*

The primary advantage that every organization benefits from an intranet is the provision of an online directory wherein profiles of all the employees are conveniently displayed.

### *Management of Documents and Policies*

Since banks tend to frequently update their policies or introduce new ones, intranet proves as a convenient platform where all employees stay updated with new developments. The managers may even set reminders for those employees who fail to read any important documents on time.

### *Online work*

Such a platform also enables banks to do away with manual work and instead step into this online platform for business. This cost-effective approach in office also helps in saving time when it comes to reading and filling forms.

Thus, other than the standard benefits of enhancing conversation and private interaction, intranet for banks also helps in smooth and effective functioning. Moreover, since not all financial institutions have the same functioning, find an intranet provider that caters to the specific needs of a bank. It is recommended to approach a company that provides seamless and personalized financial software to help meet your specific requirements. Creative Web Mall is one such company that offers intranet software equipped with tools of document reading and sharing and many more such tools with proven results.

### *Banking Technology Products and services*

#### *E-banking in India*

In India, since 1997, when the ICICI Bank first offered internet banking services, today, most new-generation banks offer the same to their customers. In fact, all major banks provide e-banking services to their customers.

#### *Popular services under e-banking in India*

- ATMs (Automated Teller Machines)
- Telephone Banking

- Electronic Clearing Cards
- Smart Cards
- EFT (Electronic Funds Transfer) System
- ECS (Electronic Clearing Services)
- Mobile Banking
- Internet Banking
- Telebanking
- Door-step Banking

*Further, under Internet banking, the following services are available in India:*

1. **Bill payment** – Every bank has a tie-up with different utility companies, service providers, insurance companies, etc. across the country. The banks use these tie-ups to offer online payment of bills (electricity, telephone, mobile phone, etc.). Also, most banks charge a nominal one-time registration fee for this service. Further, the customer can create a standing instruction to pay recurring bills automatically every month.
2. **Funds transfer** – A customer can transfer funds from his account to another with the same bank or even a different bank, anywhere in India. He needs to log in to his account, specify the payee's name, account number, his bank, and branch along with the transfer amount. The transfer is effected within a day or so.
3. **Investing** – Through electronic banking, a customer can open a fixed deposit with the bank online through funds transfer. Further, if a customer has a demat account and a linked bank account and trading account, he can buy or sell shares online too. Additionally, some banks allow customers to purchase and redeem mutual fund units from their online platforms as well.  
**Shopping** – With an e-banking service, a customer can purchase goods or services online and also pay for them using his account. Shopping at his fingertips.

**Internet Banking:**

Internet banking, also known as online banking or e-banking or Net Banking is a facility offered by banks and financial institutions that allow customers to use banking services over the internet.

Customers need not visit their bank's branch office to avail each and every small service. Not all account holders get access to internet banking. If you would like to use internet banking services, you must register for the facility while opening the account or later. You have to use the registered customer ID and password to log into your internet banking account.

**Corporate Banking:**

Corporate banking is a subset of business banking that involves a range of banking services that are offered only to corporate. The services include the provision of credit, cash management facilities, etc.

### 1. Credit

Loans and related credit products are offered to corporate customers. Credit facilities form the largest share of profits for commercial banks. Commercial Bank A commercial bank is a financial institution that grants loans, accepts deposits, and offers basic financial products such as savings accounts. The interest rates imposed on the loans are significantly high due to the amount of risk prevalent in lending to corporate customers.

### 2. Treasury services

Treasury services are used by companies to manage their working capital requirements. Such services are extremely important for multinational companies. Multinational Corporation (MNC) A multinational corporation is a company that operates in its home country, as well as in other countries around the world. It maintains a as they facilitate currency conversion.

### 3. Fixed asset requirement financing

Fixed asset requirement financing services are important for corporates involved in capital-intensive industries such as transportation, information technology, and heavy machinery manufacturing. Banks facilitate customized loans and lease agreements for the purchase of equipment, machinery, etc.

### 4. Employer services

Commercial banks also provide services such as the selection of retirement plans and healthcare plans, as well as payroll facilities, for employees.

### 5. Commercial services

Banks also provide services such as portfolio analysis, leverage analysis, debt and equity restructuring, analyses of real assets, etc. Other services that are of importance to corporate clients include asset management services and underwriters for initial public offering (IPOs), etc. The services are undertaken by the investment banking arm of the commercial bank. Investment banking and corporate banking were separated under the provisions of the Glass-Steagall Act. The Glass-Steagall Act, also known as the Banking Act of 1933, is a piece of legislation that separated investment and commercial banking. The Act came as an emergency response to the massive bank failures during the Great Depression, as it was thought that speculation by commercial banks had contributed to the crash.

### ATM

An automated teller machine (ATM) is an electronic banking outlet that allows customers to complete basic transactions without the aid of a branch representative or teller. Anyone with a credit card or debit card can access cash at most ATMs.

ATMs are convenient, allowing consumers to perform quick self-service transactions such as deposits, cash withdrawals, bill payments, and transfers between accounts. Fees are commonly charged for cash withdrawals by the bank where the account is located, by the operator of the ATM, or by both. Some or all of these fees can be avoided by using an ATM operated directly by

the bank that holds the account. ATMs are known in different parts of the world as automated bank machines (ABM) or cash machines.

**Debit Card:**

A debit card is a payment card that deducts money directly from a consumer's checking account when it is used. Also called "check cards" or "bank cards," they can be used to buy goods or services; or to get cash from an automated teller machine or a merchant who'll let you add an extra amount onto a purchase.

**Credit Card:**

A credit card is a thin rectangular piece of plastic or metal issued by a bank or financial services company, that allows cardholders to borrow funds with which to pay for goods and services with merchants that accept cards for payment. Credit cards impose the condition that cardholders pay back the borrowed money, plus any applicable interest, as well as any additional agreed-upon charges, either in full by the billing date or over time. In addition to the standard credit line, the credit card issuer may also grant a separate cash line of credit (LOC) to cardholders, enabling them to borrow money in the form of cash advances that can be accessed through bank tellers, ATMs or credit card convenience checks. Such cash advances typically have different terms, such as no grace period and higher interest rates, compared to those transactions that access the main credit line. Issuers customarily pre-set borrowing limits, based on an individual's credit rating.

**Smart Card:**

A smart card is a physical card that has an embedded integrated chip that acts as a security token. Smartcards are typically the same size as a driver's license or credit card and can be made out of metal or plastic. They connect to a reader either by direct physical contact -- also known as chip and dip -- or through a short-range wireless connectivity standard such as radio-frequency identification (RFID) or near-field communication.

**Electronic Banking Services**

Electronic banking has many names like e banking, virtual banking, online banking, or internet banking. It is simply the use of electronic and telecommunications network for delivering various banking products and services. Through e-banking, a customer can access his account and conduct many transactions using his computer or mobile phone.

Banking websites are of two types:

1. **Informational Websites** – These websites offer general information about the bank and its products and services to customers.
2. **Transactional Websites** – These websites allow customers to conduct transactions on the bank's website. Further, these transactions can range from a simple retail account balance inquiry to a large business-to-business funds transfer. The following table lists some common retail and wholesale e-banking services offered by banks and financial institutions:

## **Banking Technology in India -2023**

### **Computing Power**

Computing power has already established its place in the digital era, with almost every device and appliance being computerized. And it's here for even more as data science experts have predicted that the computing infrastructure we are building right now will only evolve for the better in the coming years. At the same time, we have 5G already; gear up for an era of 6G with more power in our hands and devices surrounding us. Even better, computing power is generating more tech jobs in the industry but would require specialized qualifications for candidates to acquire. From data science to robotics and IT management, this field will power the largest percentage of employment in every country. The more computing our devices will need, the more technicians, IT teams, relationship managers, and the customer care economy will flourish.

### **Smarter Devices**

Artificial intelligence has played an essential role in making our world smarter and smoother. It is not just simulating humans but going the extra mile to make our life hassle-free and simpler. These smarter devices are here to stay in 2023 and even further, as data scientists are working on AI home robots, appliances, work devices, wearables, and so much more! Almost every job needs smart software applications to make our work life more manageable. Smarter devices are another addition to the IT industry that is of high requirement and demand as more companies transform into digital spaces. Almost every higher-level job requires a good proficiency in IT and automation these days to thrive. This is why Simplilearn's RPA course can help you master these skills to achieve par excellence in your career, whether in IT, marketing, or management. Here are the best jobs you can venture: IT Manager, Data Scientists, Product Testers, Product Managers, Automation Engineers, IT Researchers

### **Datafication**

Datafication is simply transforming everything in our life into devices or software powered by data. So, in short, Datafication is the modification of human chores and tasks into data-driven technology. From our smartphones, industrial machines, and office applications to AI-powered appliances and everything else, data is here to stay for longer than we can ever remember! So, to keep our data stored the right way and secure and safe, it has become an in-demand specialization in our economy

### **Artificial Intelligence and Machine Learning**

Artificial Intelligence, or AI, has already received a lot of buzz in the past decade, but it continues to be one of the new technology trends because of its notable effects on how we live, work and play are only in the early stages. AI is already known for its superiority in image and speech recognition, navigation apps, smart phone personal assistants, ride-sharing apps and so much more.

### **Extended Reality**

Extended reality comprises all the technologies that simulate reality, from Virtual Reality, Augmented Reality to Mixed Reality and everything else in-between. It is a significant technology trend right now as all of us are craving to break away from the so-called real boundaries of the world. By creating a reality without any tangible presence, this technology is massively popular amongst gamers, medical specialists, and retail and modeling.

### **Digital Trust**

With people being accommodated and tangled with devices and technologies, confidence and trust have been built towards digital technologies. This familiar digital trust is another vital trend leading to more innovations. With digital conviction, people believe that technology can create a secure, safe and reliable digital world and help companies invent and innovate without worrying about securing the public's confidence. To create a safer space for digital users, cybersecurity and ethical hacking are the major specializations you can check out. In these two, there is an array of jobs you can discover from junior to senior levels. For ethical hacking, you might have to take up professional certifications, while for cybersecurity, a diploma or even a master's qualification is sufficient to aim for a high-salary role.

### **3D Printing**

A key trend in innovation and technology is 3D printing which is used to formulate prototypes. This technology has been impactful in the biomedical and industrial sectors. None of us thought of printing a real object from a printer, while right now, it's a reality. So, 3D printing is another innovation that's here to stay. For companies in the data and healthcare sector that require a lot of 3D printing for their products, various jobs pay well and are international. All you need is a sound knowledge of AI, Machine Learning, Modeling, and 3D printing. Let's check out the best jobs in this specialization

### **Genomics**

Imagine a technology that can study your DNA and use it to improve your health, helping you fight diseases and whatnot! Genomics is precisely that technology that peruses upon the make-up of genes, DNAs, their mapping, structure, etc. Further, this can help quantify your genes and result in finding diseases or any possible problems that can later be a health issue. When it comes to a specialization like Genomics, one can find a variety of technical as well as non-technical roles. Technical jobs in this area are all about designing, analyzing, and diagnostics, while non-technical jobs are concerned with higher levels of research and theoretical analysis

### **New Energy Solutions**

The world has agreed to be greener for the sake of its landscapes and the energy we use. This results in cars running on electricity or battery and houses using greener choices like solar and renewable energy. What's even better is that people are conscious of their carbon footprints and waste; thus, minimizing

it or turning those into renewable energy is even more helpful. This alternative energy arena is also boosting environment-related and data-oriented careers. These careers pertain to those in Science specializations and social science qualifications.

### **Robotic Process Automation (RPA)**

Like AI and Machine Learning, Robotic Process Automation, or RPA, is another technology that is automating jobs. RPA is the use of software to automate business processes such as interpreting applications, processing transactions, dealing with data, and even replying to emails. RPA automates repetitive tasks that people used to do.

### **Blockchain**

Although most people think of blockchain technology in relation to cryptocurrencies such as Bitcoin, blockchain offers security that is useful in many other ways. In the simplest of terms, blockchain can be described as data you can only add to, not take away from, or change. Hence the term “chain” because you’re making a chain of data. Not being able to change the previous blocks is what makes it so secure. In addition, blockchains are consensus-driven, so no one entity can take control of the data. With blockchain, you don’t need a trusted third-party to oversee or validate transactions.

### **5G**

The recent technology trend that follows the IoT is 5G. Where 3G and 4G technologies have enabled us to browse the internet, use data driven services, increased bandwidths for streaming on Spotify or YouTube and so much more, 5G services are expected to revolutionize our lives. by enabling services that rely on advanced technologies like AR and VR, alongside cloud based gaming services like Google Stadia, NVidia GeForce Now and much more. It is expected to be used in factories, HD cameras that help improve safety and traffic management, smart grid control and smart retail too. How 5G Technology Will Change the World? Just about every telecom company like Verizon, Tmobile, Apple, Nokia Corp, QualComm, are now working on creating 5G applications. 5G Network subscriptions will reach 4.4 billion by the end of 2027, making it an emerging technology trend you must watch out for, and also save a spot in.

### **Cyber Security**

Cyber security might not seem like an emerging technology, given that it has been around for a while, but it is evolving just as other technologies are. That’s in part because threats are constantly new. The malevolent hackers who are trying to illegally access data are not going to give up any time soon, and they will continue to find ways to get through even the toughest security measures. It’s also in part because new technology is being adapted to enhance security. As long as we have hackers, cyber security will remain a trending technology because it will constantly evolve to defend against those hackers.

As proof of the strong need for cyber security professionals, the number of cyber security jobs is growing three times faster than other tech jobs. According to Gartner, by 2025, 60% of organizations will use cyber security risk as a primary determinant in conducting third-party transactions and business engagements.

## CONCLUSION

In Indian banking sector was adopted in Technology in 1997. In this studies show that the mostly used e-banking services are inter account transfer, payment to other personal account, transfer to credit card account, recharge mobile phones, standing order transactions, savings, current and fixed deposit account application and debit/ credit card. Banks have not only provided e-banking facility to the customers but also increased the satisfaction level of customers. In India, people are still not fully aware of advantages of Technology banking but those who are tech savvy are using e-banking successfully. There was a time when customers used to go the bank, Insurance companies, and railway station for various purposes and used to stand in long queue for hours and hours but now many people prefer Technology banking to save time, energy, fuel, money etc. Important thing is that people need to be technically sound so that they can use e-banking facility properly. Banks should also generate trust in the minds of customers that Technology banking is safe.

## REFERENCES:

- Bonin, H. (2016). *Colonial and Imperial Banking History*. Routledge Publications.
- Calisir F. and Gumussoy, C. A., (2008). Internet banking versus other banking channels: Young consumers' view. *International Journal of Information Management*, 28, 215-221.
- Centeno, C. (2004). Adoption of Internet services in the Acceding and Candidate Countries, lessons from the Internet banking case, *Telematics and Informatics*, 21, 293-315.
- Gibbs, D. and O'Neill, K. (2012). *Green Entrepreneurship: Building a Green Economy?*
- Guerrero, M. M., Egea, J. M. O. and Gonzalez, M. V. R. (2007). Application of the latent class regression methodology to the analysis of Internet use for banking transactions in the European Union. *Journal of Business Research*, 60, 137-145.
- Nilsson, D. (2007), Internet Banking and the Impact of Seller Support and Third Party *Journal of Internet Banking and Commerce*, 12 (1), 1-9.
- Saleuddin, R. (2014). Reputation Risk Management in Financial Firms: protecting some small investors. *Journal of Financial Regulation and Compliance*. Volume 22(4).Sharma, K. (2013).
- Sohail, M.S. Shanmugham, B. (2003). *E-banking and Customer Preference in Malaysia: An Empirical Investi*