**STUDY OF INNOVATIVE PRACTICES IN BANKING SECTOR**

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**ABSTRACT**

The banking sector has undergone significant transformations due to rapid technological advancements and evolving customer expectations. This abstract explores the innovative practices reshaping the industry, such as digital banking, artificial intelligence (AI), blockchain, and data analytics. Digital banking, powered by mobile and online platforms, has made financial services more accessible and user-friendly, reducing the need for physical branches. AI and machine learning enable banks to personalize customer experiences, improve credit risk assessments, and enhance fraud detection. Blockchain technology is driving secure, transparent transactions, especially in cross-border payments, while reducing costs and enhancing security. Moreover, big data analytics allows banks to analyze vast amounts of customer data, helping in predictive analytics, customer segmentation, and targeted marketing. These innovations are not only increasing operational efficiency but also fostering financial inclusion and customer satisfaction. As banks continue to adopt these practices, the focus is shifting toward balancing innovation with data privacy, regulatory compliance, and cybersecurity to ensure sustainable growth in the digital era.

**CHAPTER 1**

**INTRODUCTION**

**1.1 INTRODUCTION**

The banking sector has undergone significant changes in recent years due to the rapid advancement of technology, increasing competition, and changing customer expectations. To stay competitive, banks have adopted various innovative practices aimed at improving efficiency, customer experience, and profitability.

One of the most significant trends in banking is the use of digital technology. Digital transformation has enabled banks to offer a wide range of services through digital channels, including online banking, mobile banking, and other self-service platforms. This has not only improved convenience for customers but has also reduced operational costs for banks. During the recent past the retail character of banking operation has become more predominant especially among the new private sector and foreign banks. Retail banking of mobilizing deposits from individuals and providing loan facilities to them in the form of home loans, auto loans, credit cards etc. is becoming popular. Banks with vision and insight are trying to woo this market although a series of innovative addition to their products, services, technology and marketing methods.

**1.2 DEFINITION**

The right kind of innovation and favorable circumstances can encourage banks to invest in new technologies that would help the financial system accomplish its functions and as a result progress occurs.

The word ‘bank’ originally came from the French word ‘banco’ which means a seat or table for exchanging money. In the past, moneylenders in Europe would place a vast collection of coins from many nations on benches or tables in order to exchange or lend them. The definitions of bank and banking; in the dictionary are Bank “An establishment for the custody, loan, exchange, or issuance of money, for the extension of credit, and for the facilitation of funds transportation”. Banking is the activity of running a bank or rendering financial services. According to the Oxford Dictionary, a bank is “A business that keeps money in custody and distributes it as the customer directs “Providing financial services to individuals businesses, and governments is the business of banking. It entails tasks including extending credit, taking deposits, distributing credit and debit cards, investing money, and other financial services. In addition, banks offer wealth management, foreign exchange, and check clearing services.

**1.3 HISTORY OF BANKING**

Banking existed in India in one form or other since time immemorial. There is plenty of classic literature available wherein we find the reference of indigenous bankers popularly known as " Sheth or Shahukar" J.B. Travermer wrote in the 70th century that every Indian village had money changers called shroff who acted as bankers to make remittance of money and issue of letters in exchange. The bankers in the Smriti period performed most of the functions which the modern time banks perform such as accepting of deposits, granting of loans to kings, acting as a banker and treasure to the state and issuing and managing the currency of the country. One finds evidential proof of hundis which were the most prominent one in monetary economy. The indigenous bankers in the historical period had combine trade with banking and this was the major cause of instability in the then period.

History of banks in India reveals illustrious lesson of The Bank of Hindustan established in Kolkata in 1770. In 1785, The Bengal Bank and The General Bank of India were established. These banks were amalgamated into the Imperial Bank of India 1920. There appears the examples of The Allahabad Bank limited in 1865, The Punjab National Bank Limited 1895, The Indian Bank Limited 1907, The Bank of Baroda Limited 1908, Central Bank of India Limited,1911. However it was found later on that many banks where not behaving appropriately in terms of financial transactions and according to the earlier report as many as 55 banks were wiped out in those days.

The banking in independent India has also undergone several changes till 1967 there were only private banks in India except State Bank of India. There was a move of social control over the banks this however was not applauded by various social groups but it was as a part of socialist polity that banks underwent a severe transformational change in the name of nationalization. The Government of India with effect from 10th July 1969, nationalised 14 major Indian Banks each with an aggregate deposit of Rs. 50 cores or more with a view to serve betters the needs of development of the economy in conformity with national priorities and objective - the government introduce the banking company's act in 1970. 11 years there after the government on April 15" 1980 took over 6 scheduled commercial banks each with demand & time liabilities exceeding with Rs. 200 crores. Today there are 19 nationalized banks operating in our country.

When traders and merchants started using money and developing mechanisms to hold and safeguard it, the history of banking began. While the first modern banks started to appear in Italy in the 14th century, the first recorded banking organization dates back to 2000 BC in Assyria. Banking started to become more controlled and organized in the 18th century, and it started to become more widespread in the 19th. In India, modern banking began in the middle of the 18th century. Among the early banks were the General Bank of India, founded in 1786 but failing in 1791, and the Bank of Hindustan, founded in 1786 and liquidated in 1829–1832. The most significant component of a nations economic and financial system is its banking system. Several more banks were founded in India after the Hindustan Bank, but only a select handful were able to maintain their positions. East India Company founded three banks known as Presidential Banks while the British Empire was in power. Three banks were the Bank of Madras (1843), the Bank of Bombay (1840), and the Bank of Calcutta (1806). With the advent of automated teller machines (ATMs), internet banking, and mobile banking after World War II, banking systems started to place a greater emphasis on customer service. Digital technology is revolutionizing banking and the way people engage with their financial institutions, making banking today a worldwide enterprise. Subsequently, in 1921, these three banks were combined into one to become the “Imperial Bank”. Once India gained independence, Imperial Bank was nationalised and renamed State Bank of India in 1955. The oldest and largest public sector bank to date is State Bank of India.

**1.4 EVOLUTION OF BANKING SECTOR**

Banking sector has undergone significant evolution over the years, driven by advances in technology, changes in regulations and shifts in customer needs and preferences. Here are some key milestones in the evolution of banking:

Early Banking :Banking originated in ancient civilizations like Mesopotamia and Egypt where merchants used to lend money to traders and farmers. Later during the middle ages the first banks emerged in Europe and the concept of interest bearing loans began to develop.

Industrial Revolution: The Industrial Revolution brought about significant changes in banking, including the emergence of joint-stock banks, the introduction of paper money, and the establishment of central banks.

Globalization: With the advent of globalization in the 20th century, banks began to expand their operations beyond national boundaries, leading to the formation of multinational banks and the development of international banking standards.

Digital transformation: In recent years, banking has undergone a massive transformation due to the rapid advancement of digital technologies. Customers can now access banking services through online and mobile banking, and transactions can be completed in real-time using digital payment systems.

Regulatory changes: Over the years, the banking sector has been subject to various regulatory changes aimed at promoting financial stability and consumer protection. These include the Basel Accords, which set international standards for banks' capital adequacy and risk management, and the Dodd-Frank Wall Street Reform and Consumer Protection Act, which was enacted in the aftermath of the 2008 financial crisis.

Fintech disruption: In recent years, the rise of fintech companies has disrupted the traditional banking sector by offering innovative financial products and services that are more convenient and cost-effective than those provided by traditional banks.

**1.5 FEATURES OF BANKING SECTOR**

* Customer centric: Innovative practices in banking sector are focused on providing a better customer experience, meeting customer needs and preferences and improving customer engagement.
* Digital: Many innovative practices in the banking sector involve the use of digital technology such as mobile banking, online banking, digital wallets and contactless payments.
* Data Driven: Innovative practices in the banking sector often involve collaboration with fintech companies, startups and other partners to develop personalized products and services.
* Collaborate: Innovative practices in the banking sector often involve collaboration with fintech companies, startups and other partners to develop new products and services.
* Agile: Innovative practices in the banking sector are characterized by their ability to adapt quickly to changing market conditions, customer needs and regulatory requirements
* Secure: Innovative practices in the banking sector prioritize security and privacy with a focus on protecting customer data and transactions from fraud and cyber threats.
* Sustainable: Innovative practices in the banking sector aim to be environmentally and socially responsible, promoting sustainable promoting sustainability and social impact as part of their business strategy.

**1.6 FUTURE OF BANKING IN INDIA**

The Indian banking has come of age in the past few years. Overall, it has been a period when banks have thrived. We have seen the growth of some Indian banks to phenomenal levels. But there’s still a fair way to go before an Indian bank can truly announce its global arrival. The imperatives that are going to be the drivers are undergoing a transformation. Shaping up of a bank internally with respect to target markets and customers, business models and risk management is going to impact the future tremendously. At external level consolidation is the word, with changes in landscape due to mergers and acquisitions being undertaken across the industry. The emerging Indian rural market is playing a big role in charting out a trend for the growth of banks. With the economy surging, the income levels have increased in rural areas. Agricultural income is on the rise. Rural market is not just for micro credit, it also possess tremendous potential for commercial banking. Till now rural banking was the forte of public sector banks, which was more of an obligation than a well thought out banking initiative for the same. With the growth in the Indian economy expected to be strong for quite some time-especially in the Services sector, the demand for banking services, especially retail banking, mortgages and investment services is expected to be strong. Mergers & Acquisitions, Takeovers, Asset sales and much more action is expected to happen on this front in India.

Even in terms of quality of assets and capital adequacy, Indian banks are considered to have clean, strong and transparent balance sheets as compared to other banks in comparable economies in its region. The Reserve Bank of India is an autonomous body, with minimal pressure from the government. The stated policy of the Bank on the Indian Rupee is to manage volatility without any stated exchange rate-and this has mostly been true. Bank credit growth has marginally slowed down to 26 percent recently, after growing at around 30 percent for three years in a row. This is the most enticing factor for foreign players. Witnessing huge foreign capital inflows lined up for the Indian markets, Indian banks too have geared themselves to infuse more money in the banking business.

The Indian banking industry is expected to grow at a CAGR of 8.6% between 2020 and 2025, driven by factors such as increasing smartphone penetration, rising disposable incomes, and a growing middle class. Digital transformation is set to play a key role in the future of banking in India. With the rise of fintech companies and the increasing popularity of online banking, traditional banks are being forced to adapt and innovate. The adoption of digital technologies such as mobile banking, online payments, and artificial intelligence is expected to accelerate in the coming years, leading to a more seamless and convenient banking experience for customers.

One of the key areas of focus for the future of banking in India is financial inclusion. Despite significant progress in recent years, there are still millions of people in India who do not have access to basic banking services. To address this issue, banks are increasingly adopting innovative solutions such as mobile banking, microfinance, and digital wallets. These solutions are helping to bring banking services to previously underserved populations, driving financial inclusion and economic growth.

Collaboration and partnerships are expected to play a significant role in the future of banking in India. Banks are increasingly partnering with fintech companies and other technology providers to develop innovative solutions and improve customer experience. Partnerships between banks and other industries, such as e-commerce and telecommunications, are also expected to increase, leading to more integrated and seamless services for customers.

The regulatory landscape is also expected to play a key role in shaping the future of banking in India. The Reserve Bank of India (RBI) has been taking steps to encourage innovation and promote financial inclusion, while also ensuring the safety and stability of the banking sector. New regulations such as the Payment and Settlement Systems Act and the RBI's guidelines on digital payments are expected to drive the adoption of digital technologies and improve the overall efficiency and security of the banking system.

**CHAPTER 2**

**RESEARCH METHODOLOGY**

**2.1 INTRODUCTION**

Research methodology is a way of explaining how a researcher intends to carry out their research. It's a logical, systematic plan to resolve a research problem. A methodology details a researcher's approach to the research to ensure reliable, valid results that address their aims and objectives. It encompasses what data they're going to collect and where from, as well as how it's being collected and analyzed. A research methodology gives research legitimacy and provides scientifically sound findings. It also provides a detailed plan that helps to keep researchers on track, making the process smooth, effective and manageable. A researcher's methodology allows the reader to understand the approach and methods used to reach conclusions. Secondary data is collected through websites, articles and books.

**2.2** **OBJECTIVES OF THE STUDY**

* To study about the banking scenario in India
* To study various innovative practices in India
* To study the various problems and challenges faced by the banks in implementation of innovative practices.
* To study how innovations have contributed to the development of Indian banking.

**2.3 SCOPE OF THE STUDY**

The rising competition, customer expectations, employee retention, diminishing customer loyalty and many social and ethical issues is the purpose for innovative practices to be adopted. Since foreign banks are playing in Indian market, the number of services offered has increased, that have created competition among banks. With increasing competition among banks, customers are also becoming more discerning and demanding. To meet customer expectations banks will have to offer a board range of deposit, investment and credit products through diverse distribution channels including upgraded branches, ATMs, mobile banking and internet. The mantra to attract and retain customers lies in efficient customer service including customized and value added products to meet the need of diverse types of customers. The sustainability issues fall into three broad categories- economic (including customers), social and environmental. Implementing policies to achieve, sustainability is not easy, maintaining right balance between all the aspects is difficult, and banks have to perform many innovative practices.

**2.4 LIMITATION OF THE STUDY**

* One of the limitations of the present study is that it is based on secondary data and survey of literature only.
* Only some selected banks (both public and private sector) of India have been taken for the study.
* There is lot of scope for further research in this area of service operations in banks. The models discussed in this article can further be applied by conducting an empirical survey to analyze the perception of customers on these banks. This is beyond the scope of this paper to identify where banks might be failing to achieve their sustainability objectives.
* The study does not involve primary data collection but materials generated from secondary data sources.

**2.5 SIGNIFICANCE OF THE STUDY**

Significance of the study means the contribution and impact of the study on a researched field. This research study helps in understanding the innovative practices used in banking sector in detail and deepen the current understanding about its impact in this current generation. Financial innovation involves the creation of new financial products enhanced processes and well-organized systems within the financial system to meet the emerging needs of stakeholders. With this study reader will get better knowledge about the growth in banking sector and it can help a bank adapt and grow in the marketplace. The researcher has collected the data through secondary sources. The secondary data has been collected from previously conducted study, articles, guides, books, internet sources etc.

**2.6 DATA COLLECTION**

For this research the researcher has collected the data through secondary sources. The researcher has done this survey to know the usage innovative practices in banking sector. The secondary data has been collected from previously conducted studies on electronic banking, Articles, guides, books and internet sources.

**CHAPTER 3**

**REVIEW OF LITERATURE**

**3.1 INTRODUCTION**

A literature review is a survey of scholarly sources (such as journal articles, and theses) related to a specific topic or research question. It is often written as part of a thesis, dissertation, or research paper, in order to situate your work in relation to existing knowledge.

* 1. **RELATED REVIEW OF LITERTURE**
		1. Gotlieb, and Denny (1993) conducted a study that one of the deals with the impact of IT on banking productivity. Computerization is one of the factors which improves the efficiency of the banking transactions. They concluded that higher performance levels have been achieved without corresponding increase in the number of employees. Also, it has been possible for Public Sector Banks and Old Private Banks to improve their productivity and efficiency by using IT.
		2. Balasubramanya Sharavasta (2002) in his study analyzed that the automation in the banking sector has come a long way starting the report on the banking sector reforms during the eighties, followed by reports of the Narasimham Committee in the nineties. With liberalization in the telecom industry and its improved reliability at a reduced cost, many banks and financial sectors at that time were going forward with large-scale networking of their branches and implementing the centralized core banking solutions. As a result, banks were able to provide their products and services to their customers anywhere, any time.
		3. Arora (2003) highlighted the significance of bank transformation. Technology has a definitive role in facilitating transactions in the banking sector and the impact of technology implementation has resulted in the introduction of new products and services by various banks in India.
		4. VijMadhu (2003) a study conducted by him, presents the changing profile of Indian banks with the help of a comparative study of three private sector banks in India namely ICICI bank, HDFC bank and IDBI bank. The author suggested developing and innovating new products so as to widen customer base and setting up of an effective software system to enhance banking efficiency.
		5. Ananthakrishnan G.(2005) described customer’s services in the banks. The author identifies banks which take care to see the reality and react early will survive and prosper, while those who continue the traditional path will find their market share eaten away.
		6. The study conducted by the authors Jain Abhay and Hundal B. S. presented the rapid changes in the financial services environment—increased competition by new players, product innovations, globalization and technological advancement have led to a market situation where battle for customers has become intense. In order to rise up to the challenges, service providers are even more interested to enhance their understanding of consumer behavior patterns. This paper examines the forces that can act as barriers in mobile banking service adoption.
		7. As per Roberts and Raphael (2007) the vast majority of observed innovative activity is based on ideas sourced from outside the focal firm and innovation diffused very quickly across the competing banks. The study puts emphasis on relationship between innovation and competitive advantage. Besides Information Technology the other most important factor that is motivating the growth of the Indian banking institutions is the liberalization. The financial sector reforms in India were designed to infuse greater competitive vitality in the banking system.
		8. Uppal R. K. in 2008 described that in the post-LPG (Liberalization, Privatization and Globalization) era and Information Technology (IT) era, transformation in Indian banks is taking place with different parameters and the curves of banking services are dynamically altering the face of banking, as banks are stepping towards e-banking from traditional banking. The paper empirically analyzes the quality of e-banking services in the changing environment.
		9. Jha in 2008 have analyzed the use and effectiveness of information technology in the Indian Banking sector. The study observes that the technology access, upgradations and innovations in various functional areas of banking are of the highest level in India and banking being one of the fastest growing sectors of the Indian economy, where technology is customer oriented service.
		10. VM Kumbhar (2009) Alternative banking: A modern practice in India" the Indian banking sector has witnessed major transformation during the last 40 year. It has passed through various phases. In the process, it has embraced superior technology, new products and services that are customer centric.
		11. V. Davda (2012) has studied and examined the economic performance and sustainability of six major banks in the private banking sector. The study reveals that HDFC has performed better in terms of Earning per Share and Net Profit margin than the remaining banks and among all the six banks, ICICI has achieved the highest yield in terms of Return on Assets as compared to the remaining selected banks because these banks have adopted more innovative and IT enabled approach to increase productivity.
		12. Sanjay Kanti Das (2013) has observed that banks in India are moving towards sustainability through social banking and innovative service operations and offerings.
		13. Seema Malik (2014) analyzed the effect of technology on transformation of banking in India and also studied the benefits and challenges of changing banking trends. Technology and financial innovations have led to tremendous improvement in banking services and operations over the past decade. Survival, growth and profitability of banks depend upon the organizational effectiveness and operational efficiency in today's competitive scenario where customers' needs are changing every day and technology is touching new highs.
		14. Capgemini Financial Services Analysis, observed in its report of smart phones rising customer expectations and changing customer demographics are pushing the need to develop innovative products and services.

**CHAPTER 4**

**TRADITIONAL BANKING AND MODERN BANKING**

|  |  |  |
| --- | --- | --- |
| **BASIS** | **TRADITIONAL BANKING** | **MODERN BANKING** |
| 1.Worldwide Access | Limited covering is offered by Conventional Practice. | Global access while seated at home or the workplace is a feature of e-banking practices. |
| 2.Marketing Tool | Conventional marketing practices do not offer effective marketing instruments | E-banking offers the capability of simple web product/scheme promotion. |
| 3.Quick Assistance | Conventional practices entail steps that take longer. | E-banking has a similar line because there is no need to wait in a lengthy line. |
| 4. Decrease in mistakes and fraud | Conventional banking procedures don't offer a thorough audit of financial activities. | Frauds and mistakes could be decreased with the method of inter-branch transaction reconciliation. |
| 5.Paperwork | Bank officials must complete a lot of documentation, which adds time and money to the process | expense and time could be cut, or everything could be done over a period of time without a lot of documentation. |
| 6. Cash holding risks | When conducting conventional commerce, one must always have cash on hand. | E-banking offers financial services using plastic money instead of transporting currency (ATMs, Credit cards are available) |
| 7.Costs | The running and fixed expenses of a conventional bank are substantial. | Even though Online banking services are virtual, they pay very little financial expense. |
| 8. Consumer assistance | Only a small portion of customers can be attended to by bank personnel and employees in conventional institutions. Additionally, customers must wait in order to conduct financial transactions. | Customers of the bank can conduct their financial operations online without waiting in a line. |
| 9.Presence | Banks with a real location exist to serve their clients | Internet banks, on the other hand, only offer services online. |
| 10.Security | Electronic security risks are not present in traditional finance. | Hackers are drawn to the lucrative target of online finance. One of the issues consumers encounter when entering accounts online is security. |

**CHAPTER 5**

**CHALLENGES FACED IN BANKING SECTOR**

**5.1 INTRODUCTION**

The banking industry faces several challenges that can impact their ability to operate efficiently, provide quality services to their customers, and remain competitive in a rapidly changing marketplace. These challenges include increasing competition from traditional and new rivals, changing customer expectations, cybersecurity threats, regulatory compliance requirements, low-interest rates, and economic uncertainty. In this context, it is essential for banks to stay ahead of the curve by investing in new technologies, adopting innovative business models, and staying up-to-date with the latest regulatory requirements. Some of the challenges are:

**5.1.1 Customer Retention**

The primary challenge facing the Indian banking system is retaining customers. A significant portion of the population still lacks access to banking services due to the dispersed and fragmented nature of locations, while those who do use banking services are on the rise. Nowadays, consumers are looking for a diverse range of products and services; they desire an optimal mix of equity and debt to support both consumption and asset creation. They require loans for purchasing cars and homes, investment plans for their children's higher education and weddings, pension plans for financial security post-retirement, and life insurance to protect their families after their passing. Essentially, they want all of these services available in one place, similar to a financial supermarket.

**5.1.2 Technological Challenges**

Technological challenges cannot be overlooked in any industry, and the banking sector is no exception, facing significant obstacles. Banks often utilize various information technology channels to deliver their services. The integration of technology has enhanced sustainability within banks, enabling them to manage increasing transaction volumes while lowering costs and processing times. Early adopters of technology gain a considerable competitive edge. For the Indian banking sector, the main challenge lies in effectively managing the development or acquisition of the right technology and its proper implementation. A lack of high computer literacy and the mindset of some senior bankers hinder full IT implementation in banks. It is crucial to foster a positive attitude towards technology adoption and establish robust security systems as an immediate priority.

**5.1.3 Financial Inclusion and Rural Micro Finance**

In their pursuit of new markets and customer demographics, and in response to RBI guidelines, banks are now viewing rural and unbanked populations as significant business prospects. Achieving financial inclusion in the banking sector is essential for narrowing the divide between the wealthy and the impoverished, as well as enhancing the living standards and economic situations of disadvantaged individuals. The contributions of self-help groups and microfinance institutions are recognized as crucial for advancing financial inclusion.

**5.1.4 Rural Banking**

With 70% of the population in our country residing in rural areas, the banking system needs to adjust its strategy for rural lending. While the banking sector in India is doing well in terms of availability, variety of products, and outreach in rural regions, there is still a pressing need for the rural financial system to expand its roles, functions, and the range of services it provides to meet the diverse credit needs of individuals in rural and semi-urban areas. Additionally, since small-scale and cottage industries significantly contribute to the growth of the Indian economy, addressing the financial requirements of this sector poses a major challenge for Indian commercial banks.

**5.1.5 Global Banking**

The 1991 new economic policy, centered around globalization, has allowed foreign banks in India more freedom, leading to an influx of these institutions. This development has prompted domestic banks to improve their performance in order to compete with the new entrants. The banking sector, like other industries, has become increasingly globalized. Foreign banks, being larger and more technologically advanced, provide Indian traders with a wider range of options. Consequently, Indian banks now face significant challenges in competing with these foreign entities.

**5.1.6 Social and Ethical Banking**

Social, ethical, sustainable development, and solidarity banking and finance are terms that describe specific approaches to managing money that prioritize non-financial considerations. This presents a challenge for commercial banks to incorporate these factors into their operations. In India, numerous banks are engaged in social and ethical banking, which enhances awareness and accountability towards society in their goals and aspirations. In addition to their profit-making objectives, these banks choose to fund projects and organizations that promote a more sustainable society and environment.

**5.1.7 Derivatives and other Risk Management Products**

Today companies and investors have become more risk seeker. The risk-taking nature of public has increased the demand for derivatives and other hedging financial products. The complex and peculiar nature of risk faced by the companies are passed onto the banks. Innovative financial tools and advance risk management methods are required by banks to capitalize on this business opportunity.

**5.1.8 Non-Performing Assets**

NPA**s** are bad loan that are difficult to recover by bank. NPAs in the books of banks carry high transaction cost. Increasing NPA create strain in the operational efficiency of banks. Although many steps have been taken but reducing non-performing assets is still has a challenge for Indian commercial banks.

**5.1.9 Human Resource Management**

Many Indian banks perform good human resource practices. Good HR practices give positive and satisfactory working environment to staff that increases employee retention, employee morale and productivity. Since customers are closely related with staff, losing key employees means losing valuable customers. The diminishing employee morale results in decrease revenue and in this era of competition retaining key employees are challenging task for banks. Top-level executives and HR departments spend large amounts of time, effort and money, trying to figure out how to keep their people from leaving.

**5.1.10 Rapid Industrial Growth**

With the government encouraging industrialization to boost economic growth, Indian companies are aiming to expand their capacity to satisfy future demand. These companies strive to enhance customer service and provide returns to shareholders, while the government focuses on improving the quality of public services. In addition to needing more operating capital to handle working capital requirements, companies also require new, cost-effective funding sources and a range of other financial products. Banks play a crucial role in financing this industrial expansion.

* 1. **RISK OBSERVED DURING BANKING ACTIVITIES**

**5.2.1 Operational Risk**

The most typical type of risk connected with I-Banking is operational risk, also known as transactional risk. It manifests as the incorrect processing of transactions, the inability to execute contracts, the compromise of data security, data privacy, and data secrecy, as well as the illegal access to and intrusion into financial systems and transactions, among other things. Such risks may be caused by flaws in the planning, execution, and supervision of institutions' computer systems. Along with technological shortcomings, human variables such as customer and employee negligence, employee fraud, and activity by crackers/hackers, etc., can pose a danger to operations. Operational risk and security risk frequently have a very narrow line separating them, and both terms are frequently used equally.

* + 1. **Security Risk**

The Internet is a public computer network with open access that enables the movement of data and information. Therefore, banks using this platform for financial operations need to have the right systems and technology in place to create a safe atmosphere for those transactions.

Unauthorized entry to a bank's vital information repositories, such as the Accounting System, danger Management System, Portfolio Management System, etc., poses a security danger. The firm could suffer immediate cash damage as a consequence of a security breach.

The internet has the ability to acquire, retrieve, and use sensitive client data, as well as to spread viruses. This could lead to data loss, client information theft or meddling, the disabling of a sizable part of the bank's internal computer system, which would prevent service, the expense of fixing these, etc. Other dangers associated with this include reputational damage, privacy violations and their legal repercussions, etc. Access management is therefore crucial. In the Internet setting, which is a public realm and where efforts at illegal access could come from any source and from anywhere in the world with or without illicit purpose, controlling access to banks' systems has become more difficult. Attackers may include hackers, dishonest suppliers, displeased workers, or even lone excitement seekers.

In addition to exterior attacks, internal security risks, such as staff fraud, are a concern for institutions. In a setting with loose controls, employees who are acquainted with various systems and their flaws can pose a security risk. They may be able to obtain the identification information needed to access client accounts, costing the bank money.

All data and information transmission over the Internet is susceptible to monitoring and reading by unauthorized parties unless specially protected. Sniffers, a type of software, can be installed at web servers and other crucial places to gather information like account numbers, passwords, account and credit card numbers. Even when data is not being transmitted over the internet, privacy and security concerns still exist. If online sites and even internal banking systems are not correctly isolated from the Internet by firewalls, the data there could become corrupted.

In a networked environment, there is a genuine risk of data alteration—either deliberately or unintentionally—by unapproved parties, whether the data is being transferred or kept. Banks place the uttermost importance on proper access management and technological tools that guarantee data integrity. Another crucial factor is whether or not there are systems in place to rapidly identify any such change and raise the alarm.

The legal validity of a transaction depends on the identity of the individual requesting the service or completing the transaction as a customer, which poses a danger to the bank. An Internet-connected computer's IP (Internet Protocol) identifier serves as a means of identification. There are techniques for "IP spoofing," the practice of posing as another machine. The name of a person can also be misrepresented. As a result, identity management is a crucial security measure in every e-banking system.

Non-repudiation is the process of establishing a record of contact between two parties, like a bank and its client, that neither can subsequently retract. The technological infrastructure of banks must be able to manage these possible danger factors.

* + 1. **System Architecture and Design**

The management of different operational and security risks involves using the right system design and controls. Banks run the danger of using the incorrect technology, having a badly designed system, and having weak control procedures. For instance, if a system only allows access based on an IP address, any user could obtain access by impersonating a legal user by changing their IP address to that of a legitimate user. In order to communicate over the Internet, many different methods are used. Each algorithm is made to handle a particular kind of data transmission. A system that supports contact through all protocols, such as telnet, FTP, and HTTP (Hyper Text Transfer Protocol), is more vulnerable to assault.

The selection of the right technology poses a possible danger for banks. Technology that is out-of-date, unscalable, or unproven could result in financial losses for the bank as well as a susceptible system and ineffective service with associated operational and security risks and business loss risk.

To install, run, and manage their e-banking platforms, many banks depend on third-party service providers. Although this might be required when banks lack the essential knowledge, it increases operational risk. The system becomes susceptible as a result of the service provider having access to all crucial business data and technological infrastructure of the bank. The choice of seller, the contractual agreement for the service's provision, etc., become crucial elements of banks' security in such a situation. The bank should train its own employees and, to the greatest extent feasible, avoid becoming overly dependent on these suppliers.

The practical risk is increased because the bank's security system is compromised if it is not updated to reflect the quickly evolving technology. Additionally, employees might not completely comprehend the nature of new technology being used. Furthermore, if updating is left completely up to the clients, it might not be updated as the bank requires. Thus, educating both customers and employees is crucial to reducing operational risk.

* + 1. **Reputational Risk**

The danger of receiving strong negative public opinion, which could lead to a substantial loss of financing or clients, is known as reputational risk. Such dangers can result from actions that seriously undermine public trust in banks' capacity to carry out essential tasks or damage relationships between banks and their customers. It might result from the institutions' own behavior or from third parties' behavior.

The primary causes of this risk include systems or products that don't meet customers' expectations, significant system flaws, significant security breaches (caused by both internal and external attacks), inadequate customer education regarding product use and problem-solving techniques, and significant communication network issues that limit customers' access to their funds or account information, particularly if there are no other available options. Customers may stop using the product or service in such a scenario. If the issue is made public, those directly impacted customers might quit the firm and others might too.

Other factors include targeted attacks on a bank like a hacker disseminating false information about bank products, a virus disrupting the bank's system causing system and data integrity issues, losses to similar institutions providing the same type of services causing customers to view other banks with suspicion, etc.

Testing the system prior to implementation, backup facilities, contingency plans, including those to handle customer issues during system disruptions, the use of virus checking, the use of ethical hackers to close security loopholes, and other security measures are possible ways to avoid this risk.

It is important for the entire system as well as just one particular organization. The financial system as a whole might experience systemic disruptions in the most severe cases. As a result, the regulator's position assumes even greater significance because no bank can collapse.

* + 1. **Legal Risk**

Legal risk occurs when laws, rules and regulations, or specified practices are broken or not followed, or when the legal rights and duties of the parties to a transaction are not clearly defined. Due to the relative youth of Internet banking, rights and duties are occasionally vague, and the applicability of laws and regulations is unclear or ambiguous, creating a legal risk.

Uncertainty regarding the legality of some agreements made through technological means and the law governing client disclosures and privacy protection are additional sources of legal risk. When using Internet banking goods or services, a client who is not properly educated about his rights and duties may not take the necessary precautions, which could result in disputed transactions, unwarranted legal actions against the bank, or other regulatory penalties. In an effort to better serve their customers, banks may connect to other websites from their own website. Legal danger may result from this. The connected site could also be used by a hacker to scam a bank client. If institutions are permitted to participate in system authentication, such as by serving as a Certification Authority, there will be more dangers. A digital certificate is used to confirm that a particular signature was produced by the claimed signer. The certifying bank may consequently be held accountable for any monetary damages suffered by the party depending on the digital certificate.

* + 1. **Money Laundering Risk**

Banks might find it challenging to use conventional methods for identifying and stopping undesirable criminal activities because Internet banking operations are carried out distantly. For some types of electronic transfers, it might not be suitable to apply money laundering laws. Banks are thus at danger of being involved in money fraud. Because of this, there might be legal repercussions for breaking "know your customer" rules. In order to prevent this, banks must create appropriate methods for client identification and screening, create audit records, carry out regular compliance evaluations, and set up policies and processes to identify and report suspicious activities in Internet transactions.

* + 1. **Cross Border Risks**

In order to prevent this, banks must create appropriate methods for client identification and screening, create audit records, carry out regular compliance evaluations, and set up policies and processes to identify and report suspicious activities in Internet transactions. It involves legal and regulation risks because there might be ambiguities regarding the legal requirements in some nations and the jurisdictional duties of various national authorities. Such factors may subject banks to legal risks related to breaking various national laws and regulations, including customer protection laws, recording and reporting requirements, privacy laws, and laws against money laundering.

Cross-border transactions increase credit risk because it is more challenging to evaluate a loan application from a customer in another nation than it is from a customer from a known customer base. Due to fluctuations in foreign exchange rates, banks that take foreign currencies as payment for electronic money may be exposed to market risk. It will be more challenging to oversee a bank's use of a service supplier in another nation, increasing operational risk. In the event that foreign parties are unable to meet their obligations due to economic, social, or political variables, the foreign-based service provider or foreign users of Internet banking are additional sources of nation risk.

* + 1. **Strategic Risks**

This danger is connected to the launch of a new good or service. The degree of this risk depends on how well the institution has addressed various issues related to developing a business plan, the availability of sufficient resources to support this plan, the reputation of the vendor (if outsourced), and the sophistication of the technology used in comparison to other technologies, etc.

Banks must conduct thorough surveys, confer with specialists in various disciplines, set realistic goals, and track success in order to reduce this risk. Additionally, they must analyze the expense and availability of extra resources, as well as the provision of sufficient support personnel, staff training, and insurance. In choosing vendors, auditing their performance, and creating backup plans in case a vendor is unable to meet their duty, due diligence must be followed. In addition, it is necessary to evaluate new technologies on a regular basis and take the associated expenses into account.

**5.2.9 Other Risks**

* Internet banking also carries the usual financial risks like credit risk, cash risk, interest rate risk, and market risk. Due to the very nature of online banking, which uses electronic networks and has no location restrictions, these dangers become more significant. For banks and regulators, their actual ramifications might, however, be of a different scale than operational, reputational, and legal threats. Comparing banks or bank companies that specialize in Internet banking to banks that participate in a range of banking activities, this may be especially accurate.
* Credit risk is the possibility that a counterparty won't fully satisfy a commitment when it's due or at any point in the future. While providing credit through remote banking processes, banks might not be able to accurately assess the credit reliability of the client, which could increase the credit risk. Banks now work with a customer group that is more recognizable. When using Internet banking's automated bill payment feature, be aware that if a third-party intermediary defaults on its payment responsibilities, credit risk may result. To reduce this danger, a customer's creditworthiness must be properly assessed, and the financing process must be audited.
* Electronic money is another service offered by online banking. It comes with a number of dangers of different kinds. In the event that an issuer fails to fulfill its duty to redeem electronic money, a bank that buys e-money from it in order to offer it to a client subjects itself to credit risk.
* Liquidity Even though a bank may eventually be able to fulfill its obligations, risk comes from the bank's failure to do so when they become due without suffering unacceptable losses. A bank involved in electronic money transmission operations must make sure that there are enough funds available at all times to meet redemption and settlement demands. In addition to putting the bank at risk for cash, failing to do so could result in judicial action and reputational risk.
* Similar to other financial institutions, banks that deal in electronic money are subject to interest rate risk due to unfavourable changes in interest rates that lower the worth of assets compared to outstanding obligations. Additionally, banks are exposed to market risk due to losses on cyclical balance sheet situations brought on by changes in market prices, including foreign currency rates. This kind of danger exists for banks that take foreign cash as payment for electronic money.
* Risk of unfair rivalry: The conflict between different institutions will increase as a result of internet banking. A few institutions may resort to unethical tactics to gain an edge over competitors due to the open nature of the Internet. Any vulnerabilities in the operating system, network link, or other areas could give them access to a competitor bank's system.
* Thus, it is clear that Internet banking has advantages but also has dangers for the bank and the financial system as a whole. The type and extent of risks that banks must manage are likely to change in the future due to the rapid speed of technical advancement. The advantages and dangers must be weighed equally. Authorities in charge of supervision and regulation must create procedures for finding new risks, evaluating risks, handling risks, and limiting risk exposure. However, because Internet banking is still in its infancy and is being developed, policies that stifle helpful experimentation and invention should be avoided by the authority
	1. **BANKING FRAUDS**
		1. **Phishing**

Scammers set up phishing websites that look like real sites, like those of banks, online stores, or search engines. They share links to these fake sites through SMS, social media, email, and instant messaging, among other channels. Many users click on these links without verifying the Uniform Resource Locator (URL) and end up entering sensitive information such as Personal Identification Numbers (PINs), One Time Passwords (OTPs), and passwords, which the scammers then collect and exploit.

* + 1. **Frauds Using Online Sales Platforms:**

On e-commerce platforms, scammers pretend to be buyers and show interest in the seller's items. Some of these scammers impersonate military personnel located in isolated areas to build trust. Rather than making a payment, they utilize the "request money" feature of the Unified Payments Interface (UPI) app and ask the seller to approve the request by entering their UPI PIN. When the seller enters the PIN, funds are transferred to the scammer's account.

**5.3.3 Frauds due to the use of unknown/unverified Mobile Apps:**

The RBI reports that scammers use SMS, email, social media, Instant Messenger, and other platforms to share app links that are disguised to look like those of legitimate organizations. They deceive customers into clicking these links, leading to the installation of unknown or unverified applications on their mobile phones, laptops, or desktops. Once these harmful apps are installed, the fraudsters can fully access the customer's device, including sensitive information stored on it and any messages or OTPs received before or after the app's installation.

* + 1. **ATM Card Skimming:**

Fraudsters install skimming devices in ATM machines to collect information from customers' cards. As stated in a release from the RBI, "They may also set up a fake keypad or a discreet pinhole camera to secretly record the ATM PIN. In some cases, fraudsters may pose as other customers nearby to observe the PIN as it is entered. This information is then used to produce a counterfeit card and withdraw funds from the customer's account."

**5.3.5 Frauds Using Screen Sharing app / Remote Access:**

The RBI has issued a warning to customers about a method used by fraudsters. They deceive customers into downloading a screensharing application, which allows the fraudsters to view and control the customer's mobile device or laptop. This access enables them to obtain the customer's financial information, which they then use to execute unauthorized fund transfers or make payments through the customer's internet banking or payment applications.

**5.3.6 SIM Swap Or SIM Cloning:**

According to the RBI, in situations like SIM swapping or SIM cloning, "Fraudsters can acquire a duplicate Subscriber Identity Module (SIM) card (including electronic-SIM) for the mobile number associated with a customer's bank account by accessing the customer's original SIM card." They then use the one-time password (OTP) sent to the duplicate SIM to perform unauthorized transactions. Typically, these fraudsters gather personal and identity information from customers by impersonating staff from telephone or mobile network companies, claiming to offer promotions such as free upgrades from 3G to 4G SIM cards or additional benefits for their SIM cards.

**5.3.7 Frauds By Compromising Credentials On Results Through Search Engines:**

Customers often turn to search engines to locate contact information for their banks, insurance companies, Aadhaar updating centers, and other businesses. However, scammers frequently alter these contact details to make them appear legitimate. As a result, customers may inadvertently reach out to unverified numbers that belong to fraudsters, which are displayed as the official contact numbers of banks or companies. When customers call these numbers, the imposters request their card credentials or details for verification. Believing the fraudster to be a legitimate representative, customers end up sharing their security information and become victims of fraud, as noted by the RBI in its booklet.

**5.3.8 Scam Through QR Code Scan:**

The RBI clarified the operation of scams involving QR codes, stating that scammers frequently reach out to customers for different reasons and deceive them into scanning Quick Response (QR) codes with their mobile apps. When customers scan these QR codes, they might unintentionally give the fraudsters permission to withdraw funds from their accounts.

**5.3.9 Impersonation On Social Media:**

The extensive use of social media and the frequent sharing of personal information have made it easier for fraudsters to obtain details to deceive individuals. According to a booklet from the RBI, "Fraudsters set up fake accounts using information from social media users on platforms like Facebook, Instagram, and Twitter. They then reach out to the friends of these users, requesting money for urgent medical needs, payments, and other reasons. Additionally, fraudsters use false identities to contact users.

Banking frauds in the digital world today may be categorized into two heads:

**a) Non-corporate e-banking frauds**

Non-corporate e-banking frauds tend to have a lesser impact on the overall economy of a country, focusing more on individual victims. However, for those who fall prey to these scams, the consequences can be devastating. Given the criminal nature of these acts, it is essential to address them firmly under relevant criminal laws to convey a strong deterrent message. Some common types of e-banking fraud that occur frequently in daily life include:

-Misuse of stolen or lost credit/debit cards by fraudsters.
-Cloning of debit/credit cards.
-Phishing, where fraudsters trick customers into revealing their personal information to steal money from their accounts.
- Theft of PIN numbers and banking passwords.
- Hacking of accounts and mobile applications.
- Theft of CVV and OTP numbers.
- Online shopping scams, where fraudsters create fake e-commerce sites.
- Deceiving individuals into sharing sensitive information like AADHAR details, ATM PINs, and account passwords under the guise of attractive gifts or lotteries, leading to financial loss.

As mentioned earlier, the effects of these frauds are not as pronounced as those caused by corporate fraud, which typically has a broader impact and involves larger sums of money. In contrast, the consequences of non-corporate fraud are primarily felt by individuals and usually involve smaller amounts.

**b) Corporate banking frauds**

**5.4 OVERCOMING CHALLENGES BY INNOVATIVE PRACTICES**

Corporate banking frauds in the digital age are particularly difficult to address due to their severe consequences for both the economy and the banking system. A notable instance of this is the collapse of YES BANK. Typically, these frauds manifest through bank loans or the misuse of banking tools, often with the complicity of insiders within the banking institutions. Corporations leverage their expertise to present significantly inflated financial statements to banking authorities, who often accept them at face value without thorough verification.

**5.4.1 SECURITY PROVIDED BY BANKS**

* Login information: The first defense mechanism is the login information you must supply. You are requested to provide an alphanumeric string that contains special characters when creating a password, and it also offers a recommendation for the ideal length.
* Encrypted data: Data that has been encrypted so that only you and your bank can decipher and read it while it is being transmitted across the internet. A hacker cannot readily decipher the code because of the cipher's complexity.
* Taking account management seriously: Banks provide extra checks in case you want to alter your password, your addresses, or add a new beneficiary or payee. Hence, a hacker will be unable to access your account and make a money transfer.
* Logout: Just one device may be used to log into your bank at once. The window or programme is immediately closed when you log out. The back button in the app or browser won't function. You will also need to log in again each time you wish to access your digital banking page.
* Authorization with two factors: It requires a card reader or mobile phone that creates a one-time passcode, as well as your password or PIN. In addition to the aforementioned, banks additionally employ firewalls and intrusion detection systems to safeguard servers and information systems. features that prevent password reuse, such as pre-enrolment with ATMs, ATM authentication, OTP verification, and not utilizing the previous three passwords.
* Email alert or confirmation: These are the standard principles that all banks adhere to. Yet, some institutions are going above and above by enhancing Digital Banking security through additional infrastructure and technology. These security attributes consist of:
* Security for IPINs: The system creates an IPIN that is sent to the user on an untamperable media. Nobody, not even the system administrator, has access to it.
* Session timeout: The website will automatically log the user out if they haven't logged in for a while.
* Digital certificate: A digital certificate used to identify the bank's server's homepage ensures users that they are on the right page. Customers are therefore prohibited from disclosing their private information on erroneous or fraudulent websites.
* Virtual keyboard: By entering your password using a virtual keyboard, you may prevent keylogger malware installed on shared computers from stealing your login information.
* Insta-alerts: Upon registration for certain transaction denominations or when you add a beneficiary, you will receive an immediate SMS or email.
* Firewalls, intrusion detection systems, intrusion prevention systems, and anti-malware systems have all been implemented as security measures.
* Certificate with extended validation for secure sockets layer (EV SSL): This gives users visual cues: a green address indicates a legitimate website, but a red bar would indicate the site is probably hazardous.
* Online spending cap: Some banks let customers establish a daily or a maximum limit for transactions made using credit, debit, or digital banking. This lowers the danger of a breach.

**5.4.2 KNOW YOUR CUSTOMER PROCESS**

Know Your Customer (KYC) process is a set of procedures that businesses and financial institutions use to verify the identity of their clients and assess potential risks of illegal intentions or transactions. The KYC process is a crucial component of compliance with Anti-Money Laundering (AML) and Combating the Financing of Terrorism (CFT) regulations.

The KYC process typically involves collecting information about the client, such as name, date of birth, address, and identification documents such as passport, driver's license, or national identity card. In addition, businesses may also collect information about the client's occupation, income, and source of wealth to assess the risk of money laundering or terrorist financing.

Once the information is collected, businesses will use various tools to verify the authenticity of the documents provided, such as electronic identity verification or face-to-face interviews. They may also check the client's name against global watchlists to ensure that they are not associated with criminal activity.

The KYC process is an ongoing process, as businesses are required to continuously monitor their clients' activities and update their risk assessments regularly. This allows them to identify any suspicious transactions or behavior and report it to the appropriate authorities.

**5.4.3 FRAUD DETECTION THROUGH INNOVATIVE PROCESS**

### ****Biometrics:****

Biometrics provides a solution for verification challenges and helps to combat credential theft. It enhances account security by offering an extra level of protection, as biometric information is difficult to replicate or breach. Common biometric methods, like fingerprint and facial recognition technology, are already in widespread use. Additionally, voice patterns possess a distinct signature and are utilized by banks to implement further security measures against fraud.

* **Artificial Intelligence:**

Manually verifying a large number of transactions is prone to errors and can be time-consuming, which is why many organizations are turning to artificial intelligence for fraud detection. This AI-driven approach identifies any anomalies from established norms to assess risks related to remote banking fraud and money laundering. Solutions based on anomaly detection are more prevalent than those relying on predictive and prescriptive data analytics.

The machine learning model used in anomaly detection is continuously trained with incoming data, which it compares against predefined standards of normalcy for various banking activities, such as transaction processing, new account creation, and loan applications. Any irregularities are flagged for human review, allowing a monitor to either validate or dismiss the alert. The monitor's decision helps the machine learning model learn whether its detection of potential fraud was accurate or if it encountered an acceptable deviation that it had not previously recognized.

Fraud detection solutions powered by machine learning can be trained to identify fraudulent activities across multiple data channels and transaction types simultaneously. Banks that implement AI-based anti-fraud systems often experience a decrease in daily false positives and an increase in actual fraud detection rates. This enables banks to better allocate resources to combat genuine fraud cases and identify new fraudulent trends. Additionally, AI can spot inconsistencies in known data, such as discrepancies between an account holder's registered location and the location of a transaction, or unusual purchasing patterns. Artificial intelligence also utilizes robotic process automation (RPA) to oversee transaction activities.

### ****Data Integration:****

Data from consortiums in the industry offers shared insights into fraudulent activities. Additionally, integrating data can eliminate silos within the organization and provide a comprehensive view of customer profiles and transactions, helping to identify risky behavior.

- Descriptive analytics: outlines past events, such as a recent weather report.
- Diagnostic analytics: investigates a phenomenon to explain why something happened, analyzing the factors that led to an event, like the weather conditions that triggered a hurricane.
- Predictive analytics: uses diagnostic data to forecast future events, similar to weather forecasting, which involves understanding local weather patterns and predicting future occurrences.
- Prescriptive analytics: suggests solutions, preventive measures, or strategies for damage control.

**CHAPTER 6**

**INNOVATIVE PAYMENT SYSTEM**

**6.1 INTRODUCTION**

Innovative Payment System, Internet is a global information system that is logically connected by a globally unique address space based on the Internet Protocol, according to the Federation National Council (FNC) in 1995. (IP). It is a network of connected computers that spans the entire world.  These computer networks connect with one another by using TCP/IP (Transmission Control Protocol/Internet Protocol) to share information.

The Internet is one of the most fascinating and significant developments in computer science and networking technologies. It offers a global platform for user-to-user and computer-to-computer communication that transcends corporate and geographic barriers.

The computer and telecom industries have undergone a complete transformation thanks to the Internet. This previously unheard-of merging of skills was made possible by the development of the telegraph, telephone, radio, and computer. The Internet serves as a platform for global transmission, a method of information dissemination, and a way for people to collaborate and communicate with their devices regardless of where they are in the world. One of the best instances of the advantages of continued investment an dedication to information infrastructure research and development is the Internet. Government, business, and academics have worked together to develop and implement this innovative new technology since the early days of packet switching study.

**6.2 TYPES OF PAYMENT SYSTEM:**

**6.2.1 ATM**

Data from consortiums in the industry offers shared insights into fraudulent activities. Additionally, integrating data can eliminate silos within the organization and provide a comprehensive view of customer profiles and transactions, helping to identify risky behavior.

- Descriptive analytics: outlines past events, such as a recent weather report.
- Diagnostic analytics: investigates a phenomenon to explain why something happened, analyzing the factors that led to an event, like the weather conditions that triggered a hurricane.
- Predictive analytics: uses diagnostic data to forecast future events, similar to weather forecasting, which involves understanding local weather patterns and predicting future occurrences.
- Prescriptive analytics: suggests solutions, preventive measures, or strategies for damage control.

**6.2.2 NEFT**

The Reserve Bank of India states that the National Electronic Funds Transfer (NEFT) is a nationwide payment system designed for one-to-one money transfers. Through NEFT, individuals, businesses, and corporations can electronically send funds from any bank branch to any recipient with an account at another participating bank branch across the country. Those with accounts at a bank can use NEFT for fund transfers, and even individuals without bank accounts can deposit cash at NEFT-enabled branches with instructions to transfer funds, although these cash transactions are limited to a maximum of Rs. 50,000 per transaction. Walk-in customers must provide complete details, including their address and phone number. NEFT thus enables fund transfers even for those without bank accounts. It is a straightforward, secure, fast, and cost-effective method for transferring money, particularly for retail remittances. Currently, NEFT operates in hourly batches, with twelve settlements available from 8 am to 7 pm on weekdays (Monday to Friday) and six settlements from 8 am to 1 pm on Saturdays.

**6.2.3 RTGS**

The Real Time Gross Settlement (RTGS) system has been in operation in India since March 2004. It allows banks to electronically instruct the transfer of funds from one bank account to another. The Reserve Bank of India (RBI) manages and operates the RTGS system, which enables efficient and rapid fund transfers between banks, thereby supporting their financial activities. As indicated by its name, the RTGS facilitates fund transfers on a 'Real Time' basis, meaning that money can be transferred to the beneficiary immediately, and the beneficiary's bank is required to credit the account within two hours. The process of continuously settling monetary transactions in real-time is referred to as real-time gross settlement (RTGS), which does not involve netting. "Real Time" means that instructions are processed as they are received, while "Gross Settlement" indicates that each transfer instruction is settled individually. Payments made through RTGS are final and cannot be reversed, as the settlement is recorded by the Reserve Bank of India. The RTGS system is primarily intended for high-value transactions, with a minimum transfer amount of 2 lakhs and no upper limit. Banks can utilize the RTGS service for customer transactions from 9:00 a.m. to 4:30 p.m. on weekdays and from 9:00 a.m. to 2:00 p.m. on Saturdays for settlements at the RBI. However, the specific hours may vary depending on the bank's location and customer service hours.

**6.2.4 Electronic Clearing System**

ECS is a different approach for processing payment transactions related to utility bills, including telephone, electricity, insurance premiums, card payments, and loan repayments. This method eliminates the necessity of issuing and managing paper instruments, leading to enhanced customer service for banks, companies, corporations, and government departments that collect or receive these payments.

**6.2.5 Immediate Payment Service (IMPS)**

The Immediate Payment Service (IMPS) allows for instant electronic money transfers at any time through mobile devices. It serves as an effective means for transferring funds between financial institutions in India via mobile, internet, and ATMs. IMPS is cost-effective both financially and otherwise. Its main goal is to enable bank customers to send and receive money using their mobile devices, simplifying payments by requiring only the recipient's mobile number, in line with the Reserve Bank of India's (RBI) efforts to promote electronic retail payments. Additionally, it aims to ensure that existing mobile payment systems in India can work together across different banks and mobile networks in a secure manner, while also establishing a foundation for a wide range of mobile banking services.

**6.2.6 Debit Card**:

Debit cards are commonly used in our daily lives for a variety of transactions. They are connected to the user's bank account, allowing the customer to simply swipe the card to make payments at point of sale (POS) locations, for online purchases, or to withdraw cash from ATMs. This process directly deducts the amount from the customer's account.

**6.2.7 Credit Card:**

Credit cards are payment cards provided by banks to customers upon request, following an evaluation of their credit score and history. They allow the cardholder to borrow money up to a predetermined limit and make purchases. This limit is set by the issuing bank. The cardholder agrees to repay the borrowed amount within a specified timeframe, along with any applicable fees for using the credit card.

 **CONCLUSION**

In the age of digitalization, this study seeks to understand users' perceptions of innovative practices in the banking sector and to identify the obstacles and challenges to their adoption. The findings reveal significant potential for increasing awareness. The research indicates that users prefer digital innovations because they save time and are user-friendly. However, concerns about the safety of transactions remain a primary issue, with fears of cash loss and difficulties with international transactions being the main barriers to adoption. This study contributes to financial research by examining digital payment systems in India. As banks continue to evolve and innovate, customers can look forward to a more convenient banking experience with broader access to various services and products. The focus is on the advantages that innovations in banking have provided to both customers and banks. Innovations such as mobile and online banking have simplified account access and transaction completion for customers while enabling banks to cut costs and improve efficiency. Looking ahead, it is crucial to consider the future of innovation in the banking sector.

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