

# INNOVATION IN INDIAN BANKING SECTOR

<sup>1</sup>T N JAYANTH

Co-author:- Prof. ALAMMA B H

<sup>1</sup>PG SCHOLAR, DEPT OF MCA, DSCE

CA – ASST.PROF, DEPT OF MCA, DSCE

**Abstract:**Information and Communication Technology (ICT) has played an important role in banking sector. As ICT helps the banking sector boost the quality and reliability of the services provided to its customers. As digital technologies are evolving worldwide at an unprecedented rate today. India also witnesses a terribly rapid rise in information and communication technology. As a result, the Indian Banking sector is undergoing enormous transformation to provide its customers with better and enhanced services. Continued ICT advancement within the banking industry has rendered virtual banking a possibility in India. Establishing Innovation Labs facilitates banks in the banking arena to pursue various avenues such as Biometrics, AI, Robotics, Data Analytics and Wearable Technology etc. Digital wallets have been paving the way for cashless transactions already. Because the nation accepts ICT developments, banks have to equip themselves with a particular infrastructure.. In this paper we can see how Indian banking innovations helped them expand and serve their customer's needs.

**Keywords:** Information and Communication Technology (ICT), Innovation, Biometrics, Artificial Intelligence (AI).

## 1. INTRODUCTION

Technology advancements implement technologies at a rapid rate in our daily lives. With increased banking sector rivalry and rising customer demand, banks are pressured to provide their online service. Banking Industry is one of the major users of communication and information technology in business life and technology has changed the face of the banking sector by means of computation

Information and communications technology or ICT are the systems and components that allow for modern computing. This applies to the integration of electronic networks of the audiovisual and telecommunications networks. ICT lets individuals and organizations connect in the digital world. Innovation

in ICT has laid strong foundations for modern banking services in the Indian banking field. The offers made to customers have seen a paradigm change. Over the last few years, tech-savvy consumer's aspirations have rising manifold. Net banking, digital wallets, mobile banking apps are the lifestyle of these users who travel around in their pockets without any hard cash.

## 2. OBJECTIVE OF STUDY

- To research how Indian banking innovations helped them expand.
- How Indian banks are faced with research obstacles.

## BANKING INNOVATION

Banking developments In India's banking sector has seen a host of changes over the years. Most banks

have begun to follow an innovative approach to banking, with the goal of creating more value for customers. Digital technology has given rise to new product design technologies and their implementation in the banking and finance sectors. Technology gives banks a chance to develop innovative solutions that meet a broad range of consumer needs, including those that today might not be conceivable.

Financial progress related to technological change has totally changed the banking mindset which is further balanced by competition from the banking system. Difficult business climate produces more competition in the banking industry's commodity, process and consumer sectors. Today we have electronic payment system alongside side currency notes. The financial sector is moving towards a scenario where it can have new tools, in addition to liquidity and security.

### **Important events in the history of new age payment systems in India:**

- Advent of card-based payments-debit card, late 1980s and early 1990s credit card.
- Introduction of an Electronic Clearing Service (ECS) in late the 1990's.
- Initiation of Electronic Funds Transfer / Special EFT.
- The Real Time Gross Settlement (RTGS) .was implemented in March 2004.
- Initiation of NEFT (National Electronic Funds Transfer) 2005/06.
- Initiation of CTS (Cheque Truncation System) in theyear 2008.

### **E-BANKING:**

E-Banking is a major Banking breakthrough. E-Banking means delivering banking products and services to customers directly via electronic delivery channels by the banks.

### **Benefits of E-Banking:**

1. E-Banking give banks a better brand image.
2. There is more room for providing differentiated services under e-banking.
3. Banking operating costs can fall.
4. Customers will enjoy banking products at a reduced cost.
5. Quicker, simpler and more reliable access to information is made accessible to customers.
6. Facilitates pre-authorized withdrawals for marking bill payments.
7. It facilitates Electronic Fund Transfer (EFT).
8. The online purchase and online payment of goods and services offered by e-banking is a blessing for the customers.

### **DEBIT CARD:**

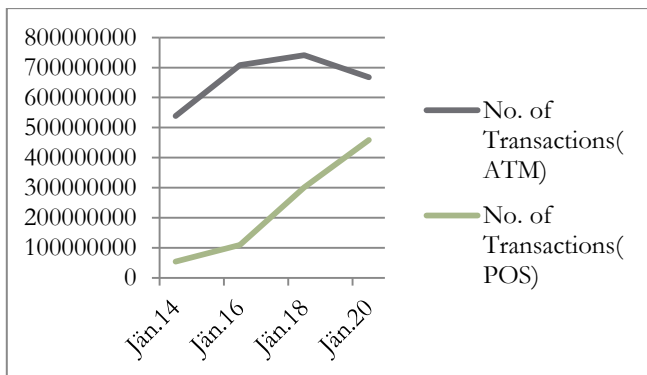
Debit card was introduced in 1980's in India. A debit card is a payment card which deducts money to pay for a purchase directly from a consumer's banking account.

Debit cards exclude the Need to bring cash or physical Cheque for the payment. Using Debit Card the bank customer can easily withdraw cash from the ATM machine.

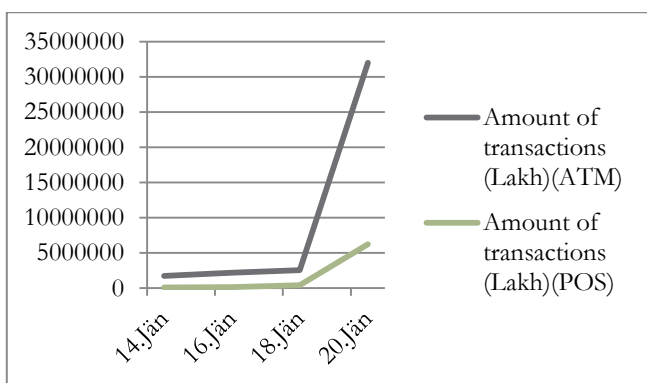
A Debit card is also referred to as a 'Check card'

### **CREDIT CARD:**

Credit card was introduced in 1990's in India. A credit card is an alternative card given to the cardholders that permits card holders to pay for the goods and services at a dealer on the understanding that the card owner is expected to pay the sums with other accepted fees. The bank maintains a revolving account which provides the cardholder with a credit limit to borrow money from the bank.



[Fig 1] Growth in No. of Transactions in ATMs and POS machine in India from 2014-2020.



[Fig 2] Growth of Amount Transactions in ATMs and POS machine in India from 2014-2020.

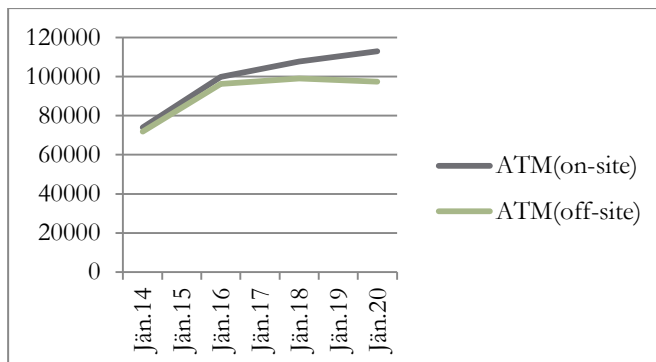
## ONLINE BANKING:

Online banking can also be referred as internet banking or web banking. It is an electronic payment system that allows the customers of a bank or other financial organization to form a variety of monetary transactions through the web site of the financial organization. The web banking industry will typically hook up with or form a part of a bank's core banking industry, and contrasts with branch banking, which was the normal way during which customers accessed banking services.

## AUTOMATED TELLER MACHINE (ATM):

An ATM is an electronic telecommunications system that allows customers of financial organization to carry out financial transactions, like cash

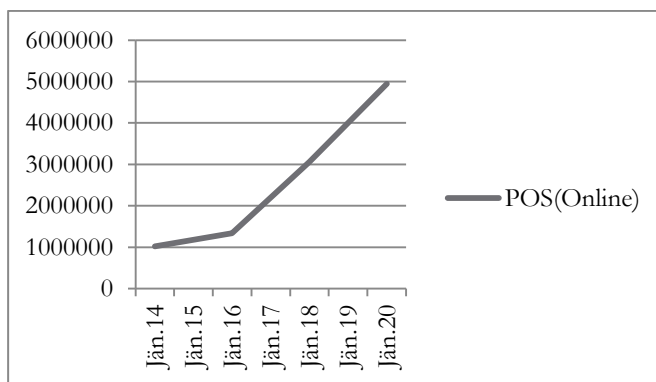
withdrawals, deposits, transfers of cash, or requests for account information, at any time and without the necessity for direct contact with bank staff.



[Fig 3] Growth of ATM Machines in India from 2014-2020

## POINT OF SALE (POS):

The sales are done at that time and location in the retail market. The merchant determines the amount owed by the customer for sale, indicates that quantity, must prepare an invoice for the customer (which may also be a ledger printout), and indicates the customer's choices to make payment. This is also the reason for which the customer pays the merchant in return for the goods or after the service has been rendered. Upon receipt of payment, the merchant can issue a receipt for the transaction, which is normally printed but may also be waived or sent electronically.



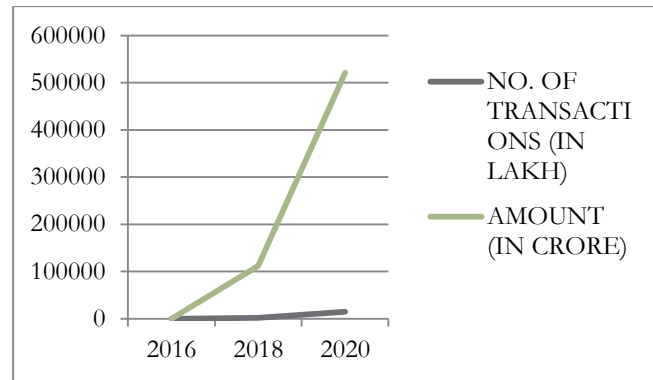
[Fig 4] Growth of POS Machines in India from 2014-2020

## MOBILE BANKING:

Mobile banking is a service offered by a bank or other financial institution that allows its customers to carry out financial transactions directly from a mobile computer such as a smartphone or laptop. Unlike the related internet banking it uses software, typically called an app, which is supported for the purpose by the financial institution. Mobile banking is usually open 24 hours a day. Many financial firms have limits on access to accounts via mobile banking, as well as a limit on the volume that may be exchanged. Mobile banking relies on the availability of the mobile device with an internet or data link.

Mobile banking transactions rely on the features of the mobile banking device issued, which typically includes accessing account balances, lists of recent purchases, electronic billing, remote control, deposits, P2P payments, and transfers of funds between customer accounts or other accounts. Some apps also enables the client to take copies of his account statements that can be downloaded as a pdf / excel file which client can take a print. The usage of the mobile banking app facilitates ease of use, efficiency, responsiveness and also enhances security, because it integrates safety regulations with the built-in mobile device of the customer.

Mobile banking, from the bank's point of view, decreases the expense of managing transactions by reducing the need for clients to visit a bank branch for non-cash withdrawal and deposit transactions. Mobile banking does not perform cash transactions, so a customer needs to visit an ATM or bank branch for cash withdrawals or deposits. Many devices already provide remote deposit options; electronically transferring cheques to their bank using a cell camera. Mobile banking is separate from mobile payments, which include using a mobile device to pay for products or services at the point of sale or remotely.



[Fig 5] Growth of Mobile Banking in India from 2016-20

### ELECTRONIC CLEARING SYSTEM (ECS):

ECS is an electronic clearing system that enables paperless credit / debit transactions directly linked to your account and also allows for a faster way to make regular and recurring payments.

ECS (Debit) advantages are , you can cover any of your Electricity phones (electricity / telephone / mobile phones, credit cards, etc.), Mutual Fund (SIP), Life Insurance, Mortgage Installments, Visa Cards, etc. Card payments, donation payments and other bill payments. Users can use ECS by registering with your service provider, banks, and financial institutions for bill payments by providing information such as name, account number, bank / branch name, MICR code, etc.

### CHEQUE TRUNCATION SYSTEM

#### (CTS):

The Cheque Truncation System (CTS) is a verification clearance method introduced by the Reserve Bank of India (RBI) to facilitate the processing of checks. This was introduced on

1<sup>st</sup> February 2008 and first implemented in New Delhi, the Cheque Truncation System (CTS) will be introduced to remove the flow of the physical movement of the check in the check clearing process. The CTS is an automated image-based check clearing

method where the check photos and the Magnetic Ink Character Recognition (MICR) data are collected and distributed electronically at the bank collection branch.

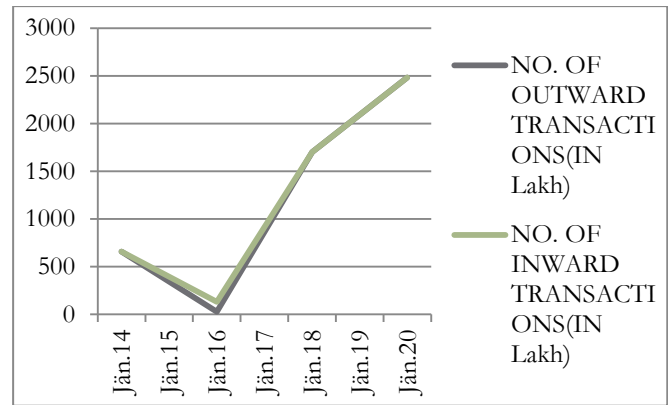
Cheque Truncation Program adds refinement to the whole operation of check collection & clearance and provides various advantages to banks, such as time and expense reduction, cost effectiveness. Including rationalization of human capital, re-engineering of corporate procedures and increased customer support.

### NATIONAL ELECTRONIC FUND TRANSFER (NEFT):

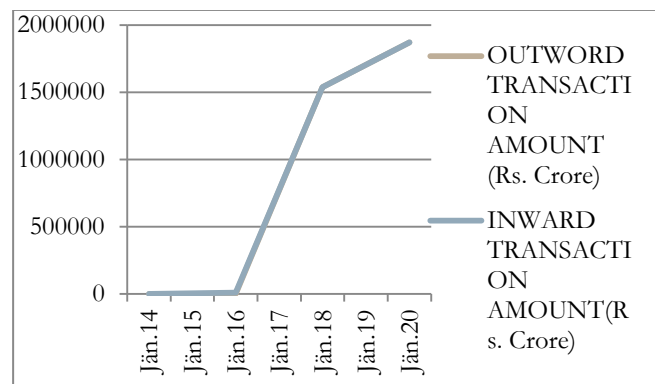
NEFT is an electronic transfer network ran by Reserve Bank of India (RBI). The program, which began in November 2005, was developed and maintained by the **Institute for Development and Research in Banking (IDRBT)**. NEFT allows bank customers in India to transfer funds on a one-to - Another between any two bank accounts approved by NEFT. It happens through electronic communication.

The funds under NEFT can be transferred by individuals, companies, or businesses holding bank branch accounts. Also individuals who do not have a bank account can deposit cash with instructions to move funds using NEFT at the NEFT allowed branches. Such cash remittances will, however, be limited to a maximum of

Rs.50,000/-per transaction. These walk-in customers have to have complete information like full address, telephone number, etc. NEFT, thus, often help to move funds even without having a bank account. This is a simple, secure, safe, fast and cost-effective way of transferring funds for retail remittances in particular.



[Fig 6] Growth of NEFT Transactions in India from 2014-20



[Fig 7] Growth of NEFT Transactions Amount in India from 2014-20

### REAL TIME GROSS SETTLEMENTS (RTGS):

RTGS system is complex funds transfer systems where the movement of money or securities takes place on a 'real-time' and a 'profit' basis from one bank to another. Settlement in "real time" means there is no waiting period for a payment settlement, with transactions being paid as soon as they are processed. "Gross settlement" means one-to - one settlement of the deal without bundling or netting for any other deal. "Settlement" means settlements are final and irrevocable after settlement.

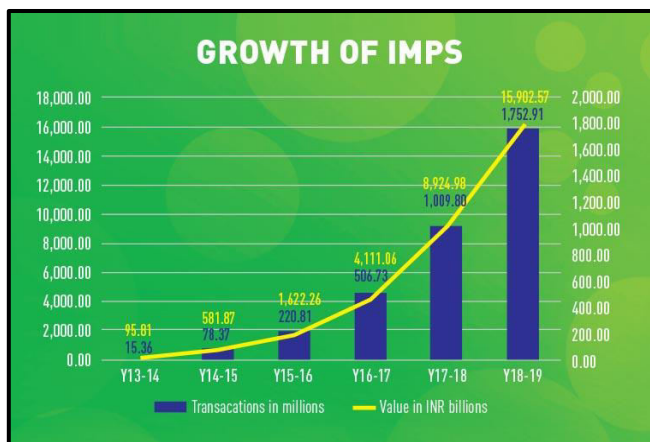
Usually RTGS systems are used for high value transactions needing and receiving immediate clearance.



## IMMEDIATE PAYMENT SERVICE (IMPS)

Is an instant interbank electronic transfer of funds payment network in India. IMPS provides an online fund transfer service through the cell phone interbank. Like NEFT and RTGS the service is available throughout the year round the clock, including bank holidays.

It is operated by India's National Payments Corporation (NPCI), and is based on the current National Financial Switch network. In 2010, the NPCI initially conducted a mobile payment system pilot with 4 member banks (State Bank of India, Bank of India, Union Bank of India and ICICI Bank) and expanded it later that year to include Yes Bank, Axis Bank and HDFC Bank. IMPS was opened to the public on 22 November 2010. In addition, there are 53 commercial banks, 101 rural / district / urban and cooperative banks and 24 private placement life insurance (PPLI) registered with the IMPS scheme.



[Fig 8] Growth of IMPS transactions in India from 2013 to 2019

Approximately 200 million IMPS transactions amounting to approximately 20 billion dollars of transaction amount occur each month in India. The sender needs to know the beneficiary's bank account number and Indian Financial System Code for transfer of money.

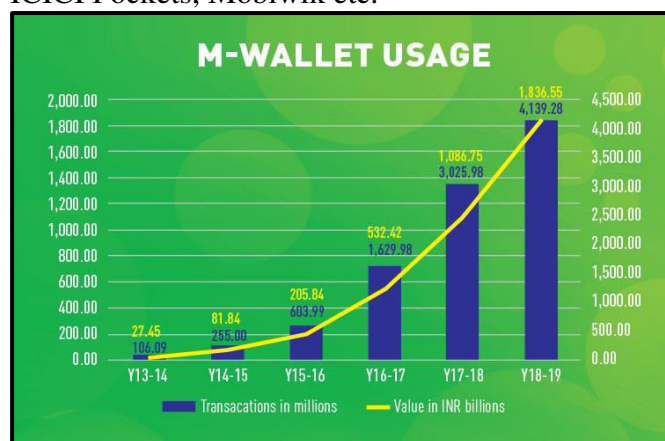
## UNIFIED PAYMENTS INTERFACE (UPI):

In 2016, National Payments Corporation of India (NPCI) introduced a Unified Payments Interface (UPI) with 21 banks members. UPI is a device that combines multiple bank accounts into one single mobile application, incorporating various banking features and smooth routing of funds. In the payment system, UPI was known as the groundbreaking technology.

## DIGITAL WALLETS:

A digital wallet is a service that lets you pay for items, usually using a cell phone device and is often called an e-wallet. For certain ways, digital wallets are not only easy to use, but also considered safer than a conventional wallet. In India, post-demonetization increased the awareness for the use of e-wallets

Ex: Paytm, Phone Pe, Jio Money, State Bank Buddy, ICICI Pockets, Mobiwik etc.



[Fig 9] Growth of M-Wallets usage in India from 2013-2019

## Artificial Intelligence and Robotics

Indian banking sector is investing heavily in automation through Robotics and Artificial Intelligence (AI). Smart machines are being deployed to meet the need of the new, tech-savvy consumer today.

Examples:

- City Union Bank based in Kumbakonam launched India's first Lakshmi banking robot

powered by AI in November 2016. All generic questions are answered aloud while important customer-related information is displayed on the screen of the robot.

- In 2016 ICICI deployed Robots Applications in its more than 200 business processes. These software robots decreased customer response time by up to 60% and increased accuracy to 100%.
- Intelligent Robotic Assistant (IRA) introduced by HDFC in one of its branches in Mumbai; This IRA directs clients into different branch banking operations.
- DIGI Bank–India's first mobile-only digital bank DIGI Bank by DBS (DBS Bank is a Singaporean multinational banking and financial services company with headquarters in Tower 3, Marina Bay, Singapore. Until the current name was adopted on 21 July 2003, the organization was known as **The Development Bank of Singapore Limited**).The largest bank in Singapore and one of Asia's leading and safest bank, has proved to be a landmark in India's AI-enabled banking services. In 2016, DBS launched the first mobile-only bank in India.DIGIBank. Unlike conventional banks, this bank is totally paperless, signature less and branchless. It's the only AI enabled virtual bank where customer authentication is achieved using Aadhaar card.

### 3. Challenges in Banking Sector

1. **Automation and AI:** will lead to unemployment and the big breakthroughs of today's innovation age are automation. While the benefits are enticing, technological transition presents a major challenge to many of the jobs that will be completely automated and job seekers prospects will be diminishing. The banking industry is no exception to this.
2. **Voice Revolution:** will take over online banking as voice recognition and voice authentication evolve, in the next few years web traffic to banking sites and mobile applications can drop by 50 per cent. Customers are simply going to Speak to an internet linked computer and perform most common banking tasks within seconds. Web traffic falling due to voice recognition systems may pose a serious threat to the banking industry. The customers who actually visit the banking tasks websites often go through the on-site marketing promotions. Banks could lose the ability to cross-sell current customers with web traffic falling.
3. **Issues related to Biometrics:** Operational issues–A minor can affect the tone of the voice and can present problems when authenticating speech. Workers who work in labor-intensive occupations may have fingerprints harmed. Even the elderly can have difficulty authenticating fingerprints.
4. **Security concerns Cyber security:** is one of the most critical challenges faced by stakeholders in the digital payment ecosystem in its note on 'Digital Payments-Evaluating the cyber landscape,' described by KPMG. As more and more consumers choose digital payments, the probability of exposure to cyber-security threats such as online fraud, identity theft and malware or virus attacks is also growing. Lack of knowledge and weak digital payment infrastructure are some of the primary factors that led to these attacks having increased.
5. **Digital literacy in rural areas:** Smartphone users in rural India have risen considerably in the last few years. But not many are aware of online banking via smartphones, and are optimistic. The main smartphone use is restricted only to entertainment and communication. As urban tech savvy customers accept the growing ICT innovation environment in banking, rural Indians also need to be trained on AI, Biometrics, Block chain, Big Data, etc. concepts.
6. **Security and protection:** Among the most critical facets of savings, including protection, efficiency and competitiveness, safety is of the highest importance. The areas that could threaten E-Banking protection can be:
  - **Credit risk** liquidity, interest rate risk, market risk Legal risk.
  - **International banking:** The effect of globalization, when they are forced to compete with international firms, creates

obstacles for the domestic companies. International bank numbers have become a big obstacle for banks of the nationalized and private sectors.

#### 4. Conclusion

In addition, banks need to realize that longevity in the modern e-economy relies on providing all of their banking services on the Web with the aid of the latest technologies. It is evident from the above discussion that most banks embraced the latest technology. Many of India's private banks, such as City Union, ICICI, AXIS, and HDFC, have brought the creative banking sector to initiative. Technological innovation in the banking sector can only be made

successful if banks find and adopt a simple, scalable and modular approach. In order to satisfy the expectations of rising clients, public sector banks would need to update their technologies and digitize with greater commitment and excitement.

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