Technology in Banking

**Introduction:**

Banking is gradually changing its course. The use of computers or the fast-developing information technology has started changing the structure of banks. Banks provides a wide range of financial services to their customer by branch expansion, new schemes of low interest credit developmental banking etc, The use of technology mechanisation and Computerisation can contribute significantly towards achieving this quickness and improvement in banking services, With the use of technology, it helps banks to keep pace with increase in the volume of business, Revolution in communications technology has sought to change the face of banking as it directly affects the speed of transfer of money.

.**' Need and Importance Of Technology in Banking**

**4.101 Role of Technology in Banking**

Role of Technology plays an important role in changing the working, Structure and efficiency of the banking system. Technology has played on important role in the working of banking institutions and the services provided by them. The 90's decade Witnessed various financial reforms, deregulation globalisation etc. coupled with rapid revolution several types of technologies and evolution of communication technologies, like internet mobile/cell phones, Safekeeping of public money, transfer of money, issuing drafts, exploring investment opportunities and lending drafts, exploring investment being provided.

Information Technology enables sophisticated product development, better market infrastructure, implementation of reliable techniques for control of risks and helps the financial intermediaries to reach geographically distant and diversified markets. Internet has significantly influenced delivery channels of the banks. Internet has emerged as an important medium for delivery of banking products and services. The customers can view the accounts get account statements, transfer funds and purchase drafts over the internet by login into the bank window. The smart card's i.e. cards with microprocessor chip have added new dimension to the scenario. Collection of payment for electricity bill and telephone bills has become easy. Continuous development in internet facility provides exceptional opportunities for the banks to reach out to its customers. No doubt banking services have undergone drastic changes and so also the expectation of customers from the banks has increased greater.

The key driver to change has largely been the increasing sophistication in technology and the growing popularity of the internet. The shift from traditional banking to e-banking is changing customer's expectations.

**4.1.2 Need and Importance of Technology in Banking**

Banking over the internet has begun in India because over the internet bankers are easily able to provide a wide range of financial services to different categories of customers from retail to corporate, irrespective of whether they are local and foreign banks. The demand for the use of sophisticated technology from customers and the availability of necessary infrastructure enable the bankers to implement the technology in the banking system.

The various forms of electronic delivery channels in India are already among the highest in the world. The legal framework in India is also supportive for electronic commerce,

A number of banks in India have formed joint ventures with commercial companies to pursue e-commerce initiatives. The traditional banks have to be prepared to meet the challenge of the internet to provide quality customer service and wide range of product & these traditional banks must ensure that the internet is not simply an add-on but is fully integrated with their existing systems and with their customer databases.

The changing role of the technology has enabled the banking sector to go beyond its traditional role and is now playing an increasingly important role in its key areas of operation as securitisation, risks preference and liquidity management.

The new products witnessing the changing customer needs are being devised as customer analytics, customer data integration, efficient delivery channels and the banks focus is now gradually changing from not only tapping new customers but also greater emphasis is being laid on retention of old customers. Currently, ATMs play an important role in tapping the customers and in future it is going to be the mobile banking, UPI/BHIM services via apps

that will replace this current feature.

 The key to the success in banking industry lies in managing it with simplicity and complexity at the same time. Simplicity means devising simple solutions for the end users and complexity means to innovate and devise better technology.

The technological changes in the banking system happened by the installation of Automated Teller Machine (ATM), Cheque Deposit Machine, Cash Deposit Machine, Credit and Debit card. With advancement of internet in urban and rural areas Mobile Banking and Mobile Banking Applications like BHIM (Bharat Interface for Money) / UPI (Unified Payments Interface), Paytm started to grow virtual banking facilities.

**4.2 Automated Teller Machine (ATM) - Onsite and Offsite ATM**

Automatic Teller Machines began to be introduced in the period 1969-1984 all over the world. In India, ATM was introduced by Hong Kong and Shanghai Banking Corporation (HSBC), they introduced the concept of ATM in India in 1987. In 1999, 12 years after their introduction, there were still only around 800 ATMs in the country. According to the latest report (April, 2020) of RBI available total number of ATMs (both onsite and offsite ATMs) are 2,10,195 nos. (onsite ATMs are 1,12,876 and offsite are ATM 97,319) and the amount of transaction by debit card is crossing 1,35,54,167 lakh Rupees on ATMs.

The banks give an ATM card to the user and allot a separate and distinctive identification number for each customer. This is also known as Permanent Identification Number [PIN]. In case banks having interconnectivity among branches or ATMs elsewhere, customers can operate ATM card anywhere.

The important services offered are cash withdrawals and cheque deposits, account balance enquiry, statement of account, request of cheque book and standing instructions fund transfer to beneficiaries by account number.

**Benefits to Customers:**

(1) 24 x 7 services: ATMs offer services beyond bank working hours, 24 hours and 365 days.

(2) Time saving: Customers need not spend time waiting for cash withdrawal in banks.

(3) Withdraw money from anytime and anywhere: Customers can withdraw money from ATMs located at different places away from the branch.

(4) Easy to use: They provide ease of operation and facilitate self service by Customers.

(5) Highly secure: There is security and privacy for the customer in his transactions.

 **Benefits to Banks:**

(i) Maintaining existing customers: When banks offer convenience and better services, their customers remain with them.

(2) Increased services for customers: Banks can offer a variety services to their customers through ATMs.

(3) Greater market area: The more convenient the services offered by the banks are, larger is the market area the bank is able to cover.

(4) Remote transaction facility: ATMs facilitate banking transactions being recorded from remote areas as they are connected through communication channels with the bank.

(5) Low operating cost: Customers have started to use jnternet banking facilities and this has put less pressure on the bank branches which reduces the operating cost for the banks.

**The Structure of ATMs:**

The following modules are the part of any standard ATM:

(1) cpu/Processor: The processor is the main brain behind an ATM. The processor handles all the necessary interfaces with the various ATM modules, It receives commands through the Consumer Interface Panel (CIP) and decides on further processing.

(2) consumer Interface Panel (CIP): It consists of a set of devices provided to user/consumer of ATM service. It consists of (a) Key pad, (b) display, (c) dedicated slot for inserting card, (d) printing unit and (e) envelopes. The display unit is a high resolution monitor, which displays messages/ pictures. The display is visible only to the consumer and not to the person nearby. Consumer keypad is lower for privacy and it has 10 numeric keys and a cancel key, accept key, correction key.

(3) Card Reader: Motorized card reader is provided on the ATMs. The card reader, as soon as inserted by the consumer, reads the magnetic track on the cards or the new EMV based chip cards introduced by RBI in May, 2015 for enhanced security. The consumer can take back the card after completing the transactions.

(4) Printers: There are two printers provided in the ATMs. One printer is for the consumer and the other one is a journal printer. Both are not visible to the customer. After the transaction is over, the details of the transactions carried out are printed and sent out through a slot provided for the purpose and consumer picks them up. Now the customer-has the choice of taking print out of transaction or not. The journal printer provides an audit trail of all completed transactions. The transaction data is also available in electronic media.

(5) Dispenser: The currency notes are stored in cassettes in the dispenser. The dispenser picks the currency and delivers the same to the consumer through a slot provided in the front panel. The currency dispensers use either friction pick or vacuum pick technology depending upon the technology available with the ATM. if a consumer leaves behind the currency by mistake and walks out, the dispenser times out and retrieves the currency back into the ATM and deposits it into a separate bin. Now this facility of taking currency back into the ATM is not available.

**Types of Automated Teller Machines (ATM):**

(1) Onsite ATM: The ATMs installed within the premises of bank are called onsite ATMs. Total number of onsite ATMs installed is 1,09,419 nos., according to the latest report (September, 2019) of RBI.

(2) Offsite ATM: The ATMs installed outside the premises of bank are called offsite ATMs. Total number of offsite ATMs installed are 97,170 nos., according to the latest report (September, 2019) of RBI.

(3) White Label ATMs: The ATMs which are set up, owned and operated by non bank entities. The Reserve Bank of India has permitted the launch of White Labelled ATMs

In

(WLAs) under the payment and settlement system Act, 2007,i.e. private non bank companies are allowed to set UP, own and operate its own brand of country to aid financial inclusion and drive ATM penetration in the launched the first white Label ATM in India under the brand name the idea of White Label ATM is not successful.

(4) Brown Label ATMs: Brown Label ATMs are those Automated Teller hardware and the lease of the ATM machine is owned by a service provider, management and connectivity to banking networks is provided/ a sponsor

(5) Other Types of ATMs:

(a) Green Label ATMs: These ATMs are provided for agricultural transactions.

 (b) Orange Label ATMs: These are provided for share transactions.

(c) Yellow Label ATMs: These are provided for E-commerce.

(d) Pink label ATMs: These are ATMs that which are used only by women. This purpose of such ATMs is to mitigate the problem of women standing in long queues of ATM.

(e) Biometric ATM: ATMs which use security features like fingerprint scanner and eye scanner of the customer to access the bank details. Nowadays, with the introduction of Aadhaar based withdrawal, most the ATMs are upgraded fingerprint scanners.

**Other Type of Machines used in Banking:**

(1) Cash Deposit Machine (CDM):

The Cash Deposit Machine (CDM) is an ATM like machine and self-service terminal lets customer make deposits and payment transactions by cash. The CDM allows customer account holder to deposit cash directly into account using the ATM cum debit card. You use this machine to instantly credit account without visiting the branch. The transaction receipt also gives updated account balance. xCash Deposit Machine Of SBI does not allow deposit cash into accounts maintained Cash Deposit Machine of SBI does not allow of cash into accounts maintained by ICICI Bank.

**Features of CDM:**

(1) Instant credit of cash deposit into your own account.

(2) Quick and convenient way to deposit cash.

(3) Paperless transaction.

(4) The per transaction limit to deposit money varies from bank to bank. However' minimum amount that can be deposited is 100 and the maximum amount the 49,900 per transaction (or below 50,000). For SBI the per transaction limit

 49,900/- for Cardless deposit and through Debit Cards 2.00 lacs (subject to that the accountholder has a PAN number).

 an Technology in Banking you can also deposit cash in your PPF, RD and Loan accounts.

(6) Up to 200 currency notes can be deposited in a single transaction.

 The CDM only accepts denominations of currency notes in 100/-r

(7) 500/- and 2000/-.

**(2) Cheque Deposit Machine:**

The Cheque Deposit Machine is a Self-Service Kiosk designed for automation of cheque

collection operations and issuing receipts to the users. This Cheque Deposit Machine can be by Cheque Payment Collection Centers of Telecom Companies, Insurance Premium collection Centers, Building and Construction Companies and other applications

requiring automatic cheque collection like Utility Bill Payment etc. Most of the Cheque Deposit Machines are found in the e-lobby of the bank in the premises of the bank.

**Features of Cheque Deposit Machine:**

 (1) This Cheque Deposit Machine works 24 x 7.

(2) It 'is FREE of cost so there is cost saving.

(3) There is no need to wait at the counter for acknowledgement, so there is time saving.

**(3) Passbook Printing Machine:**

Passbook Printing Machine is an automated kiosk where in customer can print passbook on their own. The machine recognizes the account details from the magnetic strip placed on the passbook, through these details the kiosk fetches the account transaction details and prints it on passbook. Customer can use this facility 24x7 from the SSPBP machine installed in E-lobby/ATM.

 **Features of Passbook Printing Machine:**

(l) Passbook Printing Machine is a fully automated machine having the ability to auto flip, auto align and update the customer passbook without any intervention of the branch staff or the customer.

(2) Customer has to simply insert passbook with only cover page opened so it is very convenient for all the customers.

(3) Machine will automatically flip and align the pages and print on appropriate page/ locations.

(4) Passbook printing machine uses magnetic stripe or bar code based account recognition system. It will bear a preprinted number which is already stored in the magnetic stripe of the passbook and mapped with the customer's account,

(5) Passbook pages have been made with grey scale strips, facilitating easy reading.

(6) Simple, convenient, cost saving and time saving process.

(7) Services available 24x7 (in e-lobbies and ATM cabins).

4.3 **Debit Card and credit Card**

**4.3.1 Debit Card**

 A debit card is an ATM card that can be used at certain merchandised outlets to make payments. Debit cards combine the functions of ATM cards arid cheque, Debit cards are issued by banks but are used at stores used to withdraw money from banks and ATMs. The amount gets debited from the debit card holder's account automatically.

**Advantages of Debit Cards:**

(1) You do not have to carry your cheque book and present identification, but are still able to make purchases directly from your bank account.

 (2) It is cost saving and time saving

(3) You pay your bills immediately, unlike when you use a credit card and get the bill later.

 (4) Increased use of cards and better network of cardholders increases the popularity of the bank.

**Disadvantages: of Debit Cards:**

(1) Consumers using debit cards do not have the riéht to withhold payment (the money is immediately removed from the account), in the event of a dispute with the merchant over the goods or services paid for.

(2) Some banks and merchants charge transaction fees for using debit cards.

(3) If your debit card number is stolen on the internet, the thief may drain your bank account before the bank is able to complete its investigation.

(4) Debit card holders need to remember PIN, if the debit card holder forgets the PIN he/she is notable to use the debit card.

**4.3-2 Credit Card**

In the process of evolution, different forms of bank money came into existence. The latest form of bank money to enter into the Indian Financial System is the credit card. The quality of these forms of money is the convenience in carrying and effecting the transaction. It is an instrument devised by a bank to provide credit facilities to its holder for purchasing goods and services. Sometimes, it is referred to as 'plastic money' because it is made of plastic which is durable and convenient. to carry. There has been a growth of the credit card business and its increasing use is a step towards a cashless society. These• cards are acceptable to business establishments whose names are notified by the bank to the cardholder. Thus, a credit card facility is a tripartite arrangement involving (a) the issuing bank, (b) the card holder and (c) the member establishments,

**Features of Credit Card:**

(I) Some banks issue cards to their customers only while some others issue cards to non-members also.

 (2) Some banks do not charge any fee for the issue of cards, while some charge initial enrolment fee as well as some annual fee.

(3) Any person whose income is above a minimum level (per annum) prescribed by the issuer bank becomes eligible to apply for a credit card.

(4) The credit card is a plastic card containing the name of the issuer bank, card number, name of the card holder and signature of the card holder.

(5) The credit cards issued by the concerned bank are accepted by many establishments like shops, hotels, departmental stores, travel agents, tourist companies, private bus operators, railways and airlines.

(6) White purchasing of goods and services (e.g. travel), the cardholder signs a charge slip. This can be tallied with the specimen signature on the card. One copy of the chargeslipis given to the cardholder and the other copy is submitted to the bank issuing the card.

(7) The bank makes payment to the establishment, after deducting its commission (usually ranging between 2% and 4%). The bank then bills the cardholder for the full amount, at the end of a specified period, usually monthly.

(8) The cardholder, when not an account holder of the bank, has to make a full payment within 15 days.

(9) Banks allow payment in easy installments the period of payment in installment may vary from bank to bank. Some banks offer free credit for 30 days.

 **Parties to a Credit Card:**

1. The Cardholder

2. The Issuing bank

3. Member Establishment

**Advantages to the Credit Card Holder**

1. It provides the cardholder inbuilt credit up to certain limit.

2. It is safer because no need to carry large amounts of cash.

3. Credit cards give purchasing power to the card holders.

4. Certain benefits like insurance and discounts are available to credit cardholders

e.g. personal accident insurance, Mediclaim insurance, and discounts offered on certain items purchased by them from member establishments.

5. The cardholder is relieved of the worry of possible loss since he can travel without carrying much cash.

6. In case of need the card holder can use the card to withdraw cash.

**Advantages to the Bank:**

 It can bring profit to the bank out of income/commission earned.

 The bank can attract new potential customers resulting in development of banking habits among the people.

3. It leads to increase in business turnover due to the use of card by cardholders.

4. Increased use of cards and better network of cardholders increases the popularity of the bank.

5. The bankjs customer base increases.

6. The bank's interest income increases when cardholders avail of loan facility to settle the bills.

7. It can reduce credit risk of the bank since the cardholders who avail of credit facility are financially screened by the bank.

**Advantages to the Member Establishments:**

 (1) Their sales increase and so do their profits.

(2) They can sell goods on credit but not at their own risk. Their payment is guaranteed by the issuing banker.

 (3) The names of dealers who are members are notified and they get publicity in a number of ways.

(4) Member establishments provide incidental services to cardholders, e.g. reservation on telephone etc.

 (5) In case of loss, the holder’s liability is limited.

 (6) Above all, customer just carries a card and buys whatever he wants is a great facility.

**Disadvantages of Credit Card:**

1. All outlets do not accept the card.

2. The customer tends to overspend.

3. The cardholder is responsible for charges due to loss or theft of the card and the bank may not be a party for loss due to fraud or co}lusion of staff, etc.

4. Some credit card transactions take longer time because of various formalities.

 5. Discounts and rebates can rarely be obtained.

6. It might lead to spending habits and cardholders may end up' in big debts.

7. Customers may be denied cash discount for payment through credit card.

**Precautions to ensure the safety of his card:**

 1. The cardholder should not keep the card unsigned once he receives it from the

2. customer should ensure that the charge slip is prepared in his presence and signs it 3, customer should always take his card back after the charge slip is prepared.

4. Customer should never sign any charge slip which is incomplete.

5. The cardholder must confirm that the amount shown in the charge slip as the same

**4,3.3 personal Identification Number (PIN) Use and Safety**

A personal Identification Number (PIN) is a secure alphanumeric or numeric code used for authenticated access to a system. A PIN serves as a validation tool for users of various types of networks and systems, such as computer networks, credit/debit cards, and mobile phones. PINs are used across multiple sectors, including banking, payment processing, and communications.

Use:

A personal Identification Number (PIN) is a security code for verifying account holders identity. Similar to a password, PIN should be kept secret because it allows access to important services such as financial transactions.

The banks issue cards with PIN generally disclaim any liability in case the cardholder compromises the confidentiality of the PIN, loss of card or loss of PIN.

Loss of card, if any, cardholder should report to the bank immediately so that appropriate steps to prevent misuse are taken up immediately if the confidentiality is compromised.

**Safety Measures:**

(1) Never keep PIN in simple number sequences like 1234 0303, 0000 etc., dates, such as birth year or spouse's birthday, any part of address or phone number etc.

(2) Never write PIN on ATM or debit card.

(3) Always keep the PIN secret.

(4) Change the PIN at regular intervals.

(5) Never keep the same PIN for multiple ATM or debit card.

**4.4 Tele banking I Phone Banking**

Telephone Banking is an automated service that allows you to access your account information and perform routine transactions from a touch-tone telephone.

**Features of Telephone Banking:**

(1) Caller Identification: Your calls are automatically recognized when called from a registered mobile number.

(2) Dynamic Card activation: IVR provides instant card activation menu if you have any cards pending activation.

(3) Account Balance: Receive your account balance and last 5 transactions via sms through Telephone Banking.

(4) Instant TPIN Registration: Telephone Banking Pin (TPIN) registration is made simpler, faster and more secure.

(S) Updating mobile number: Now you can update your local or international mobile

(6) Card PIN Change: Change your Credit and Debit Card PIN through IVR instantly.

(7) Pay Utility Bills: It helps in paying different types of utility bills Credit Card bills.

**Advantages of Tele banking / Phone Banking:**

1. Phone banking enables customers of the financial institution to perform financial transactions over the telephone, without the need to visit a bank branch or automated teller machine.

2. Telephone banking reduces the cost of handling transactions by reducing the need for customers to visit a bank branch for noncash withdrawal and deposit transactions.

3. Telephone banking times can be longer than branch opening times, and some financial institutions offer the service on a 24 hour basis.

**4.5 Net Banking**

Customers can do various banking functions directly through computer with good internet connection. Number of banks are now offering the NET banking services. Customer has to log in to the bank's homesite, after log in into his/her account various services banking functions can be done via NET banking like account opening, balance enquiry, bank statements, cheque book requests, open and close Fixed and Recurring Deposit, taking overdraft against the FD or RD, Pay Taxes and foreign exchange rates, etc.

The Net banking is redefining the relationship between banks and their customers. Customers will demand many more products than simple savings account.

**Advantages of Net Banking:**

1. Customers immediately get the confirmation of transaction and account balance instantly reflected in their account.

2. It is easy to transfer funds between customer's accounts.

3. Requests for Demand Drafts and Banker's cheque issued from his account can be made by the customer by giving details of amount, location and beneficiary.

4. Stop Payment Request can be made on a cheque or cheques online.

5. The customer can view the status of a specific cheque-that he has issued on any of his/her accounts.

6. The customer can request for a new cheque book online.

7. Customer can open Fixed Deposit, Recurring Deposit.

 8. Income Taxes and other types of taxes can be paid from the Net banking facility.

 9. Banking transactions can be carried out safely and with total confidentiality.

**Disadvantages of Net Banking:**

(1) Hacking: Most the customers are financially illiterate, unknowingly they tell

preci0US information about the account to the third person that raises some concern about the security of the account.

 (2) Full transaction right not given to retail customers that stops customer from using the facility efficiently,

 (3) Stable internet connection is required or else that stops retail customers from using

**4.6 Mobile banking**

Mobile banking is a system which allows customers of a bank to conduct financial transactions through mobile telecommunication devices such as mobile phone or tablets.

**Advantages of Mobile Banking:**

1. Mobile Banking offers security, convenience and ease of payment.

2. It can be used Anywhere Anytime to make payment.

3. Reduces risk of fraud because of immediate SMS sent to the customer about the activity in account.

4. It is time saving and cost efficient.

5. It is an additional channel for customer payments.

 6. Banks can use existing infrastructure.

7. Merchants can accept small payment amounts.

**Disadvantages of Mobile Banking:**

1. Security Threats: Bank account details can be stolen and money can be stolen.

2. Compatibility: Mobile banking is not available on non compatible mobile devices.

3. Extra Cost: Some financial institutions charge extra fee for mobile banking services.

4. Limit on Money transfer: There is limit on the amount transferred by using Mobile banking.

**4.6.1 Mobile Banking Applications • BHIM (Bharat Interface for Money) I UPI (Unified Payments Interface)**

Unified Payment Interface is an initiative by National Payments Corporation of India (NPCI), set up with the support of the Reserve Bank of India and Indian Banks Association (IBA). Bharat Interface for Money (BHIM) was launched in January, 2016.

BHIM/UPI is advanced version of IMPS. Bharat Interface for Money (BHIM) is a payment app that lets you make simple, easy and quick transactions using Unified Payments Interface (UPI).

Register on BHIM:

(l) Download and install BHIM app from Google Play store or Apple App store.

(2) Select preferred language.

 (3) Select Subscribers Identification Module (SIM) which has mobile number that is registered with bank.

 (4) Login by setting a 4 digit application passwords

(5) Select and link desired bank account customer can link multiple bank accounts to

(6) Set UPI PIN by providing last 6 digits and expiry date of debit card,

(7) Account is now registered and ready to use.

**Features of Bharat interface for Money (BRIM)/Unified Payments Interface (UPI):**

(1) Customer can make direct bank payments to anyone on UPI using their UPI ID scanning their QR with the BHIM app.

 (2) Customer can also request money through the app from a UPI ID.

 (3) BHIM is a unique payment solution which can be used without internet as Customer can dial \*99# from any phone and avail the same features of BHIM on mobile screen. Customer can also register for BHIM using \*99#.

 (4) BHIM can be used currently on all handsets with iOS (version 9.0 and above) and Android OS (version 5.0 and above).

 (5) Customer can use BHIM outside India to send and collect money for your local accounts. (NRI/NRE accounts required for the same.)

(6) There is no need to provide bank account details such as account number or IFsc code, all transactions can be carried out using only a VPA.

(7) Customers can directly pay users using their VPA or scan and pay using the QR code option in the BHIM app.

**Advantages of BHIM/UPI.•**

(1) Money is transfer on real time basis.

(2) Money can be sent and received instantly on al.1 365 days in a year on a 24/7 basis.

 (3) The service can also be used on bank holidays.

(4) It is time saving and cost efficient.

(5) No charges for transacting on BHIM. But banks can impose charges.

(6) Immediate confirmation of transfer by SMS.

(7) To promote the services, customer can get attractive cash back offers.

(8) Various types of Recharges and Bills can be paid by using this service.

(9) It can be used without internet by registering on service.

**Disadvantages of BHIM/UPI:**

(1) Limitation on transfer of fund by using this service.

(2) Security Threats: Bank account details can be stolen and money can be stolen•

(3) Cost: Some financial institutions charge extra fee for mobile banking services

4**.7 Electronic Funds Transfer (EFT)**

(1) Electronic Fund Transfer (EFT) began to appear in the international banking scenario since 1969. An electronic funds transfer (EFT) is a transaction that takes place over a computerized network, either among accounts at the same bank or to different accounts at separate financial institutions.

(2) Reserve Bank of India introduced a system called "The Reserve Bank of India Electronic Funds Transfer system - 1997" which may be referred to as "RBI EFT System" on the recommendation Shere Committee.

 (3) With the increase in the volume of transaction's in the banking System, technological innovations are being introduced in order to increase the efficiency of the payment

(4) The customer also has to give details like the beneficiaries name, his account number, amount to be deducted etc. and has to sign a form that authorizes his bank to deduct payment on a certain date.

(5) The existing system of funds transfer involves the use of instruments like cheques, drafts etc. These are paper based instruments. Electronic Funds Transfer (EFT) is a means of facilitating an efficient funds transfer and clearing system.

(6) It is a system in which the banks are required to credit the accounts of their customers on the basis of electronic message received from the clearing house.

(7) The earliest definition provided in the United States Electronic Fund Transfer Act, 1978 Section 205.3(b) of this Act states, "Electronic Fund Transfer," refers to a transaction initiated through an electronic terminal, telephone, computer, or magnetic tape that orders, instructs or authorizes a financial institution to either credit or debit a customer's asset account. The term electronic terminal includes point-of-sale terminals, ATMs, and cash dispensing machines. This definition includes not only credit transfers but almost alt forms of electronic payments like card payments, ATM transactions and telebanking.

(8) The transfer of funds credit transfer or debit transfer is made electronically. Thus there is no transfer in the form of cash or paper based instrument.

(9) Credit transfer means that a person who makes the payment gives an instruction to the bank, while debit transfer means that the instruction is given by the person who receives the payment.

**Advantages of Electronic Funds Transfer System**:

(1) Time savings: Money transfer between virtual accounts usually takes a few minutes, while a wire transfer or a postal one may take several days.

(2) Reduced risk of loss and theft: You cannot forget your virtual wallet somewhere and it cannot be taken away by robbers. Although there is some risk of scammers but with appropriate precautions we can reduce the risk from scammers.

(3) LOW commissions: If you are using traditional method of remitting money the commission paid is high. But through the electronic payment system customer needs to pay negligible commission. This is a considerable advantage.

(4) User friendly: Usually every service is designed to reach the widest possible audiences, user friendly interface, In addition, there is a support team, which often works 24/7.

(5) Convenience: All the transfers can be performed at anytime, anywhere. It's enough to have an access to the Internet.

**Disadvantages of Electronic Funds Transfer System:**

(1) Restrictions: Each payment system has its limits regarding the maximum amount in the account, the number of transactions per day and the amount of output.

(2) The risk of being hacked: If customer follows the security rules the threat is minimal, it can be compared to the risk of something like a robbery. The worse situation is when the system of processing company has been broken, because it leads to the leak of personal data on cards and its owners. Even if the electronic payment system does not launch plastic cards, it can be involved in scandals regarding the identity theft.

(3) The problem of transferring money between different payment systems: Usually the majority of electronic payment systems do not cooperate with each other. In this case, you have to use the services of e-currency exchange, and it can be time consuming if you still do not have a trusted service for this purpose.

(4) The lack of anonymity: The information about all the transactions, including the amount, time and recipient are stored in the database of the payment system. And it means the intelligence agency has an access to this information. You should decide whether it's bad or good.

(5) The necessity of Internet access: If internet connection fails, you cannot get to your online account.

 4**.8 Real Time Gross Settlement (RTGS)**

(1) RTGS stands for 'Real Time Gross Settlement.'

(2) RTGS system was introduced in India on 25th March, 2004, to work on the basis of Indian Financial System Code (IFSC).

(3) 'Real Time' means the processing of instructions at the time they are received 'Gross Settlement' means that the settlement of funds transfer instructions occurs individually.

Real Time Gross Settlement, which can be explained as a system where there is continuous and real time settlement of fund transfers, individually on a transaction-by-transaction basis (without netting).

(4) RTGS system is a comprehensive and secured online payment mechanism.

(5) Under RTGS system, the interbank payment in instructions is processed through0Ut the day, on transaction-by-transaction basis.

(6) RTGS system was set up, operated and managed by Reserve Bank of India (RBI).

 (7) Parties under RTGS System:

(a) The Originating Bank (RTGS Operating Bank).

(b) The Customer (Who sends money).

(c) The Beneficiary (To whom money is sent).

(d) The Clearing Institution (RBI).

(e) The Receiving Bank (Who receives money for the beneficiary).

(8) RTGS is not a 24 x 7 system. With effect from August 26th, 2019, the RTGS service window for customer transaction is available from 7.00 A.M. to 6.00 P.M. on a working day. The RTGS service window for inter-bank transactions is available from 7.00 A.M. to 7.45 P.M. (Refer the circular DPSS (CO) RTGS No.364/04.04.016/2019-20 issued by RBI on 21st August, 2019.

(9) The minimum amount to be remitted through RTGS is with no upper or maximum ceiling.

(10) RTGS transactions charges

 (a) Inward transactions — free, No charges

(b) Outward transactions — to : 25 + applicable time varying charge, but not exceeding 30/-; Above : 50 + applicable time varying charge but not exceeding 55/-.

**The Essential information needed to be provided by the customer for RTGS transfer.**

(1) Amount to be remitted

(2) The account number to be debited

(3) Name of the beneficiary bank and branch

(4) The IFSC number of the receiving branch

(5) Name of the beneficiary customer

(6) Account number of the beneficiary customer

(7) Sender to receiver information, if any

**Advantages of RTGS:**

(l) It is a safe and secure system for funds transfer resulting in reducing the risks associated with fund transfer.

(2) RTGS transactions / transfers have no amount cap.

 (3) The system is available on all days when most bank branches are functioning, including saturdays.

 (4) There is real time transfer of funds to the beneficiary account to transfer the funds quickly.

(S) The remitter need not use a physical cheque or a demand draft,

(6) The beneficiary need not visit a bank branch for depositing the paper instruments.

(7) The beneficiary need not be apprehensive about loss / theft of physical instruments Or the likelihood of fraudulent encashment thereof.

(8) Remitter can initiate the remittances from his / her home / place of work using internet banking, if his / her bank offers such service,

(9) The transaction charges have been capped by RBI helps in reducing Ost of transfer of funds.

**4.9 'National Electronic Funds Transfer' (NEFT)**

NEFT stands for 'National Electronic Funds Transfer'. It is a nation-wide payment system facilitating one to one funds transfer.

 (2) National Electronic Funds Transfer System (NEFT) introduced in the year 2005, works on the basis of Indian Financial System Code (IFSC).

(3) Under this scheme, individual firms and corporates can electronically transfer funds from any bank branch to any individual, firm or corporate having an account with any other bank branch in the country participating in the scheme.

(4) NEFT system was set up, operated and managed by Reserve Bank of India (RBI).

(5) According to the Reserve Bank of India, the objectives of the NEFT system are:

(a) To establish an electronic funds transfer system. to facilitate an efficiently secure, economical, reliable and expeditious system of funds transfer and clearing in the banking sector throughout India and

(b) To relieve the stress on the existing paper based funds transfer and clearing system.

(6) Under NEFT system, the interbank payment in instructions is processed throughout the day on half hourly basis in batches.

(7) Parties in NC-FT

The parties to a funds transfer under NEFT system are:

 (i) The Sending Bank.

(iii) The NEFT clearing center

(v) The Beneficiary Branch

(ii) The Sending Service center

(iv) The Receiving service center

(8) The timing of were NEFT made available on 24 x 7 basis across all 365 days of the year with effective from December 16th, 2019, Earlier, NEFT transfer timings were

fixed from 8 a.m. to 7.00 p.m. on bank working days. The settlements are done in 48 half hourly batches every day. The settlement of first batch will commence after 00:30 hours and the last batch will end at 00:00 hours. (Refer the circular DPSS (CO) RPPD No.1097/04.03.01/2019-20 issued by RBI on December 6th, 2019.

(9) Limitation on the transfer Amount:

(i) There is no limit — either minimum or maximum - on the amount of funds that could be transferred using NEFT.

(ii) Maximum amount per transaction is limited to 50,000/- for cash based remittances within India and also for remittances to Nepal.

(10) Charges on NEFT

(i) Inward transactions- Free, no charges to be levied on beneficiaries.

(i) Outward transactions at originating bank branches

 For transactions up to 10,000: Not exceeding 2.50 (+ Applicable GST)

For transactions above 10,000 up to 1 lakh: Not exceeding 5 (+ Applicable GST)

 For transactions above 1 lakh and up to 2 lakhs: Not exceeding 15

(+ Applicable GST)

 For transactions above 2 lakhs: Not exceeding 25 (+ Applicable GST)

1(1) NEFT can also be used to transfer funds from to NRE and NRO accounts in the country. This however, is subject to the adherence of the provisions of the Foreign Exchange Management Act, 2000 (FEMA).

1(2) The beneficiary can expect to get credit for the NEFT transactions within two business hours from the batch in which the transaction was settled. For example, if a customer submits a fund transfer request at 12.05 p.m. to an NEFT enabled branch, the branch in turn forwards the message through its pooling centre to the NEFT Clearing Centre for processing in the immediately available next batch which (say) is the 12.36 pm batch. Then the transactions will be settled before 2.30 pm. Later the beneficiary bank has to credit the beneficiary's account within 30 minutes of receiving the funds transfer message.

**Advantages of NEFT:**

(l) The remitter need not send the physical cheque or demand draft to the beneficiary.

(2) The beneficiary need not visit his / her bank for depositing the paper instruments.

(3) The beneficiary need not be apprehensive of loss / theft of physical instruments or the likelihood of fraudulent encashment thereof.

(4) Cost effective.

(5) Credit confirmation of the remittances sent by SMS or email.

(6) Remitter can initiate the remittances from his home / place of work using the internet banking also.

(7) Near real time transfer of the funds to the beneficiary account in a secure manner.

**The following essential information needs to be provided by the customer for NEFT transfer.**

Originating and destination bank branches should be part of the NEFT network:

 (1) Beneficiary name (2) Account Number

 (3) Account Type, (4) Bank Name and

 (5) IFSC of the beneficiary bank branch

**Procedure of Fund Transfer through NEFT 1 RTGS:**

**Working if RTGS System:**

Step 1:

 (i) A customer has to fill an application form providing details of the beneficiary (like name of the beneficiary, name of the bank branch, IFSC of the beneficiary bank branch, account type and account number and the amount to be remitted.

(ii) Customers can also initiate the funds transfer request online or from the branch by filling the prescribed RTGS form.

 Step 2: The originating bank branch will enter the information and authorise the transaction.

 Step 3: The information provided to intraday liquidity management department once they clear it goes to RTGS server.

Step 4: The information goes to RBI's IFTP (Inter Bank Funds Transfer Processor) and RTGS server.

Step 5: Beneficiary Bank gets the confirmation of fund transfer.

Step 6: Beneficiary bank credits it to the Beneficiary customer account within 30 minutes of receiving the funds transfer message.

**Working of NEFT System: Step 1:**

(i) An individual / firm / corporate has to fill an application form providing details of the beneficiary like Name of the beneficiary, Name of the bank branch, IFSC of the

beneficiary bank branchi account type and account number and the amount to be

customers cash also initiate the funds transfer request online. Some banks offer the NEFT facility even through the ATMs.

(iii) walk-in customers will, however, have to give their contact details (complete address and telephone numbers. etc.) to the branch.

Step 2: The originating bank branch prepares a message and sends the message to its

pooling centre (NEFT Service Centre).

Step 3: The pooling centre forwards the message to the NEFT Clearing Centre (operated

National Clearing Cell, Reserve Bank of India, Mumbai) to be included for the next available batch.

Step 4: The Clearing Centre sorts the funds transfer transactions destination bank wise and prepares accounting entries to receive funds from the originating banks (debit) and give the funds to the destination banks (credit).

Step 5: Bank wise remittance messages are forwarded to the destination banks through their pooling centre (N EFT Service Centre).

Step 6: The destination banks receive the inward remittance messages from the Clearing

Centre and pass on the credit to the beneficiary customer s accounts.

**Immediate Payment Service (IMPS):**

(1) IMPS is an innovative real time payment service that is available round the clock. This service is offered by National Payments Corporation of India (NPCI) that empowers customers to transfer money instantly through banks and RBI authorized Prepaid Payment Instrument Issuers (PPI) across India.

(2) IMPS is real time remittance service available anytime, anywhere across India.

 (3) Customers can transfer money real time to any person or to a merchant, for any personal or commercial purpose.

(4) IM PS is available round the clock and operates even during bank holidays, weekends or festive holidays.

(5) IMPS can be used on any of the following platforms.

 (a) Mobile phones.

(b) Smartphone - Bank App/ SMS / WAP/USSD (NUUP).

(c) Basic phone-SMS/USSD (NUUP).

(d) Internet - Bank's Internet banking facility.

(e) ATM-By using ATM Card at Banks ATM,

(6) IMPS funds transfer can be done by three ways:

(i) Using Mobile number and MMID : MMID is a seven digit number, first four digits of which are called NBIN (allocated to member by NPCI) and last three digits are provided by the member,

A combination of mobile number and MMID is linked to a unique account number.

 (ii) Using beneficiary account number and IFSC.

(iii) IMPS allows funds transfer using the Aadhaar number.

Parties involved in fund transfer:

 (1) Remitting customer (2) Remitting bank/PPI (3) NPCl's IMPS switch

(4) Beneficiary bank/PPI (5) Beneficiary customer

**Advantages of IMPS:**

(1) Instant domestic fund transfer.

(2) Available 365 x 24 x 7.

(3) Safe and secure. (4) Easily accessible.

(5) Cost effective.

(6) Available on Mobile, Internet and ATM.

(7) Debit and Credit Confirmation by SMS.

**IMPS Settlement Process**:

(1) A transaction is received at NPCI for routing to beneficiary bank/PPI only after debiting the remitting customer's account. Therefore, the risk of a remittance being made with the remitting customer not having adequate funds does not arise.

(2) Once the transaction reaches the beneficiary bank/PPI. The beneficiary bank should credit the beneficiary's account immediately. So, from customer's point of view the transaction is real time.

(3) But from the bank/PPI perspective, interbank settlément of debiting the sending bank/PPI and crediting the beneficiary bank/PPI would take place on a net basis four times a day on RTGS working dåys. Settlement pertaining to four cycles of Sunday would be merged and settled through RTGS on Monday in single file.

4**.10 Society for Worldwide Inter Bank Financial**

**Telecommunication (SWIFT)**

(1) The SWIFT is an abbreviation of The Society for the Worldwide Interbank Financial Telecommunication.

(2) In 1973, 239 banks from 15 countries got together to solve a common problem how to communicate about cross border payments. SWIFT was set up by and for its users to support international finance and commerce,

 (3) The banks formed a cooperative utility, the Society for Worldwide Interbank Financial Telecommunication, headquartered in Belgium.

(4) SWIFT went live with its messaging services in 1977, replacing the Telex technology which is the reliable, trusted for institutions all around the world.

(5) The main components of the services included a messaging platform, a computer system to validate and route messages and a set of message standards.

(6) The standards were developed to allow for a common understanding of the data across linguistic and systems boundaries and to permit the seamless, automated transmission, receipt and processing of communications exchanged between users.

(7) 518 institutions from 22 countries were connected to SWIFT's messaging services in 1977 when SWIFT went live. SWIFT had processed a total of 10 million messages in less than 12 months.

(8) In 1980 Hong Kong and Singapore started live operations, and by 1983 more than 1,000 users from 52 countries were using SWIFT services, SWIFT processed 46.9 million messages that year.

(9) In 1992 SWIFT's Interbank File Transfer went live, and by 1996 SWIFT was carrying over 3 million messages in a single day.

(10) The SWIFT community continued growing to connect more than 9,000 users from more than 200 countries and territories. By 2009, SWIFT carried 3.76 billion messages per year.

 1(1) In 2014 SWIFT launched local joint venture with India (SWIFT India). The main objective is to deliver the benefits of renowned financial messaging services for domestic traffic of Indian user community.

1(2) SWIFT is now a global financial infrastructure that spans every continent, 200+ countries and territories, and services more than 11,000 institutions around the world. In the year 2018, SWIFT handled 7.8+ billion messages per year.

1(3) Swift Code Message Format

 (1) First 4 characters - bank code (only letters).

(2) Next 2 characters - ISO 3166-1 alpha-2 country code (only letters).

(3) Next 2 characters - location code (letters and digits).

(4) Last 3 characters - branch code, optional ('XXX' for primary office) (letters and digits). Let's analyse the SWIFT code for the State Bank of India Pune Main Branch.

swift code of SBI PUNE MAIN BRANCH SBINlNBB238.

(1) First 4 character bank code (only letters) = SBIN.

(2) Next 2 characters country code (only letters) = IN.

(3) Next 2 characters (location code) = BB.

 (4) Last 3 characters (branch code) = 238.

**4.1'1 Cyber Security in E-Banking**

Cyber security has been of great importance in the financial sector. It becomes all the more necessary since the very foundation of banking lies in nurturing trust and credibility.

**Importance of Cyber Security in Banking:**

The banking sector has been under attack for hundreds of years, First, it was the physical theft of monies. Then it was computer fraud. Today, it's not only cyber fraud but hacks into servers to obtain a customer's Personally Identifiable Information (PII).

(1) Customers seem to be going cashless, using digital money, e. debit cards and credit cards. In this context, it becomes very important to ensure that all measures of cyber security are in place, to protect your data and your privacy.

(2) For banks, Data breaches are a serious problem. A weak cyber security system can amount to data breaches that could easily cause their customer base to take its money elsewhere. It leads losing trust in financial institutions.

(3) When a bank's datå is breached customers tend to lose time and money. Recovering from the same can be time consuming and stressful. It would involve cancelling cards, checking statements, and keeping your eyes open for complications.

(4) Customer. private data in the wrong hands can do great harm to banks and customers. Customer data is sensitive and could reveal a lot of information that could be used against him.

(5) Customer data with the bank can be breached if not protected from cybercrime threats.

**Safeguard against attacks with Secured Software:**

Banks must consider enhancement or complete replacement of your current protection applications. Here are following things to look at in the world of banking software development.

(1) Security Audit: Security audit must be done before any new cyber security software is implemented. The security audit reveals the strengths and weaknesses of the existing setup. Furthermore, it provides necessary recommendations to improve software.

(2) Firewalls: Cyber security banking configuration does not only include applicati0nS• An updated firewall, banks can block malicious activity before they reach other parts of the network.

(3) Anti-virus and anti-malware applications: A firewall upgrade increases protecti0nl it won’t. Stop attacks unless anti-virus and anti-malware applications are updated In turn, it can miss a potentially disastrous attack on your system.

(4) Multi-Factor Authentication (MFA): MFA is extremely critical to protect customers who utilize mobile or online apps to do their banking. Many users never change their passwords or make small changes. It stops attackers from reaching the network because it asks for another level of protection. For instance, a six-digit code sent to a customer's cell phone.

(5) Biometrics: Biometrics is a advanced version of MFA even more secure than a texted code. This form of authentication relies on retina scans, thumbprints or facial recognition to confirm a user identity. It is more difficult to accomplish for hackers.

(6) Automatic logout: Automatic logout minimizes this by closing a user's access after a few minutes of inactivity.

(7) Education: They can't help if customers continue to access their information from unprotected locations or improperly protect their login credentials. This is why education is important. When banks notify their customers of consequences related to these vulnerabilities it may move them to change their habits for fear of losing their investments.