

UNIT-III

E-PAYMENT SYSTEMS:

What is Internet Banking?

Internet Banking, also known as **net-banking** or **online banking**, is an electronic payment system that enables the customer of a bank or a financial institution to make financial or non-financial transactions online via the internet. This service gives online access to almost every banking service, traditionally available through a local branch including fund transfers, deposits, and online bill payments to the customers.

Internet banking can be accessed by any individual who has registered for online banking at the bank, having an active bank account or any financial institution. After registering for online banking facilities, a customer need not visit the bank every time he/she wants to avail a banking service. It is not just convenient but also a secure method of banking. Net banking portals are secured by unique User/Customer IDs and passwords.

DIGITAL PAYMENT REQUIREMENTS:

About Digital Payments

The Government of India has been taking several measures to promote and encourage digital payments in the country. As part of the 'Digital India' campaign, the government aims to create a 'digitally empowered' economy that is 'Faceless, Paperless, Cashless'. There are various types and modes of digital payments. Some of these include the use of debit/credit cards, internet banking, mobile wallets, digital payment apps, Unified Payments Interface (UPI) service, Unstructured Supplementary Service Data (USSD), Bank prepaid cards, mobile banking, etc.

Digital payment methods are often easy to make, more convenient and provide customers the flexibility to make payments from anywhere and at anytime. These are a good alternative to traditional methods of payment and speeden up transaction cycles. Post demonetization, people slowly started embracing digital payments and even small time merchants and shop owners started accepting payments through the digital mode.

What is a Digital Payment

To put it in simple words, a digital payment occurs when goods or services are purchased through the use of various electronic mediums. There is no use of cash or cheques in this type of payment method.

What is a Cashless Economy

In a cashless economy, all transactions are carried out using different types of payment methods and this does not involve the physical use of money for the purchase of various goods and services.

10 Types of Digital Payment Methods in India

1. Banking cards
2. USSD
3. Aadhaar Enabled Payment System (AEPS)
4. UPI
5. Mobile Wallets
6. Bank pre-paid cards
7. Point of Sale (PoS)
8. Internet Banking
9. Mobile Banking
10. Bharat Interface for Money (BHIM) app

1. **Banking cards:** Cards are among the most widely used payment methods and come with various features and benefits such as security of payments, convenience, etc. The main advantage of debit/credit or prepaid banking cards is that they can be used to make other types of digital payments. For example, customers can store card information in digital payment apps or mobile wallets to make a cashless payment. Some of the most reputed and well-known card payment systems are Visa, Rupay and MasterCard, among others. Banking cards can be used for online purchases, in digital payment apps, PoS machines, online transactions, etc. How to get Banking cards?

- Apply with your respective bank and provide Know Your Customer (KYC) details

- The card will get activated within a week and you will be allotted a 4-digit pin, which can be used for all transactions

2. USSD: Another type of digital payment method, *99#, can be used to carry out mobile transactions without downloading any app. These types of payments can also be made with no mobile data facility. This facility is backed by the USSD along with the National Payments Corporation of India (NPCI). The main aim of this type of digital payment service is to create an environment of inclusion among the underserved sections of society and integrate them into mainstream banking. This service can be used to initiate fund transfers, get a look at bank statements and make balance queries. Another advantage of this type of payment system is that it is also available in Hindi.

AEPS: Expanded as Aadhaar Enabled Payment System, AEPS, can be used for all banking transactions such as balance enquiry, cash withdrawal, cash deposit, payment transactions, Aadhaar to Aadhaar fund transfers, etc. All transactions are carried out through a banking correspondent based on Aadhaar verification. There is no need to physically visit a branch, provide debit or credit cards, or even make a signature on a document. This service can only be availed if your Aadhaar number is registered with the bank where you hold an account. This is another initiative taken by the NPCI to promote digital payments in the country.

UPI: UPI is a type of interoperable payment system through which any customer holding any bank account can send and receive money through a UPI-based app. The service allows a user to link more than one bank account on a UPI app on their smartphone to seamlessly initiate fund transfers and make collect requests on a 24/7 basis and on all 365 days a year. The main advantage of UPI is that it enables users to transfer money without a bank account or IFSC code. All you need is a Virtual Payment Address (VPA). There are many UPI apps in the market and it is available on both Android and iOS platforms. To use the service one should have a valid bank account and a registered mobile number, which is linked to the same bank account. There are no transaction charges for using UPI. Through this, a customer can send and receive money and make balance enquiries.

Mobile Wallets: A mobile wallet is a type of virtual wallet service that can be used by downloading an app. The digital or mobile wallet stores bank account or debit/credit card information or bank account information in an encoded format to allow secure payments. One can also add money to a mobile wallet and use the same to make payments and purchase goods and services. This eliminated the need to use credit/debit cards or remember the CVV or 4-digit pin. Many banks in the country have launched e-wallet services and apart from banks, there are also many private players. Some of the mobile wallet apps in the market are Paytm, Mobikwik, Freecharge, etc. The various services offered by mobile wallets include sending and receiving money, making payments to merchants, online purchases, etc. Some mobile wallets may charge a certain transaction fee for the services offered.

PoS terminals: Traditionally, PoS terminals referred to those that were installed at all stores where purchases were made by customers using credit/debit cards. It is usually a hand held device that reads banking cards. However, with digitization the scope of PoS is expanding and this service is also available on mobile platforms and through internet browsers. There are different types of PoS terminals such as Physical PoS, Mobile PoS and Virtual PoS. Physical PoS terminals are the ones that are kept at shops and stores. On the other hand, mobile PoS terminals work through a tablet or smartphone. This is advantageous for small time business owners as they do not have to invest in expensive electronic registers. Virtual PoS systems use web-based applications to process payments.

Internet Banking: Internet banking refers to the process of carrying out banking transactions online. These may include many services such as transferring funds, opening a new fixed or recurring deposit, closing an account, etc. Internet banking is also referred to as e-banking or virtual banking. Internet banking is usually used to make online fund transfers via NEFT, RTGS or IMPS. Banks offer customers all types of banking services through their website and a customer can log into his/her account by using a username and password. Unlike visiting a physical bank, there are no time restrictions for internet banking services and they can be availed at any time and on all 365 days in a year. There is a wide scope for internet banking services.

Mobile Banking: Mobile banking is referred to the process of carrying out financial transactions/banking transactions through a smartphone. The scope of mobile banking is only expanding with the introduction of many mobile wallets, digital payment apps and other services like the UPI. Many banks have their own apps and customers can download the same to carry out banking transactions at the click of a button. Mobile banking is a wide term used for the extensive range or umbrella of services that can be availed under this.

Bharat Interface for Money (BHIM) app: The BHIM app allows users to make payments using the UPI application. This also works in collaboration with UPI and transactions can be carried out using a VPA. One can link his/her bank account with the BHIM interface easily. It is also possible to link multiple bank accounts. The BHIM app can be used by anyone who has a mobile number, debit card and a valid bank account. Money can be sent to different bank accounts, virtual addresses or to an Aadhaar number. There are also many banks that have collaborated with the NPCI and BHIM to allow customers to use this interface.

What are the different security requirements of digital payments?

Ans: The different security requirements of digital payments are mentioned below:

- Confidentiality
- Integrity
- Authentication
- Availability
- Authorization
- Non-repudiation

Digital Token-Based Electronic Payment Systems

Electronic tokens are three types:

1. Cash or Real-time • Transactions are settled with exchange of electronic currency.

- Ex: on-line currency exchange is electronic cash (e-cash).

2. Debit or Prepaid • Users pay in advance for the privilege of getting information.

- Ex: prepaid payment mechanisms are stored in smart cards and electronic purses that store electronic money.

3. Credit or Postpaid

- The server authenticates the customers and verifies with the bank that funds are adequate before purchase.
- Ex: postpaid mechanisms are credit/debit cards and electronic checks.

Properties of Electronic Cash:

- There are many ways that exist for implementing an e-cash system, all must incorporate a few common features.
- Specifically, e-cash must have the following four properties:

1. Monetary value
2. Interoperability
3. Retrievability
4. Security

Electronic Cash in Action

- Electronic Cash is based on cryptographic systems called —digital signaturesl.
- This method involves a pair of numeric keys: one for locking (encoding) and the other for unlocking (decoding). (Through public key and private key).

Purchasing E-cash from Currency Servers

The purchase of e-cash from an on-line currency server (or bank) involves two steps: • Establishment of an account and

- Maintaining enough money in the account to bank the purchase. Some customers might prefer to purchase e-cash with paper currency, either to maintain anonymity or because they don't have a bank account. Using the Digital Currency
- Once the tokens are purchased, the e-cash software on the customer's PC stores digital money undersigned by a bank.
- The users can spend the digital money at any shop accepting e-cash, without having to open an account there or having to transmit credit card numbers.
- As soon as the customer wants to make a payment, the software collects the necessary amount from the stored tokens.

Electronic Checks

- It is another form of electronic tokens.
- In the given model shown in fig, buyers must register with third-party account server before they are able to write electronic checks.
- The account server acts as a billing service.

• The advantages are:

1. They work in the same way as traditional checks.
2. These are suited for clearing micropayments
3. They create float & availability of float is an important for commerce
4. Financial risk is assumed by the accounting server & may result in easier acceptance.

Credit Card-Based Electronic Payment Systems

Payment cards are all types of plastic cards that consumers use to make purchases: – Credit cards

- Such as a Visa or a MasterCard, has a preset spending limit based on the user's credit limit. – Debit cards

- Removes the amount of the charge from the cardholder's account and transfers it to the seller's bank. – Charge cards

- Such as one from American Express, carries no preset spending limit.

Advantages: – Payment cards provide fraud protection. – They have worldwide acceptance (nearly!). – They are good for online transactions.

Disadvantages: – Payment card service companies charge merchants per-transaction fees and monthly processing fees.

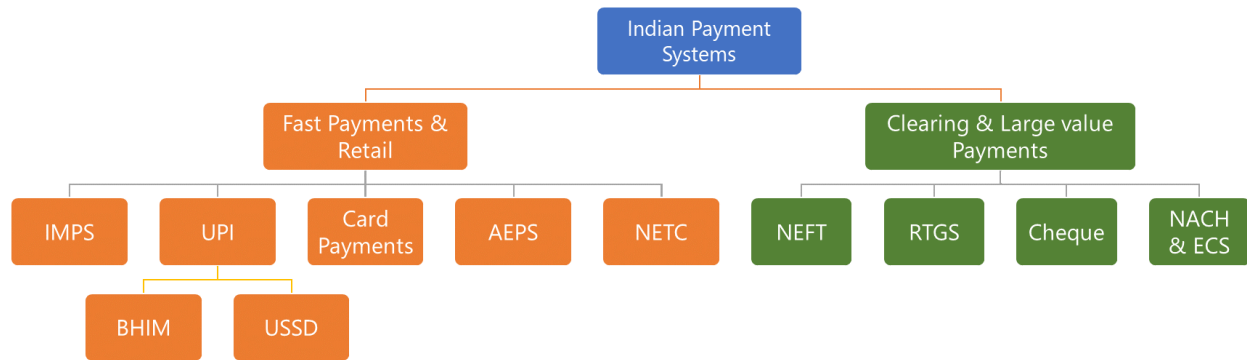
Classification of new payment system:

NPCI & RBI must be greatly appreciated for creating a robust and resilient payment systems backbone for making India, a true “Digital Economy” state. A decade earlier, the predominant mode of payments for individual/business, small/large value payments used to cash, card, cheque, ECS, NEFT & RTGS. However, in the recent years, introduction of IMPS, AEPS, UPI (BHIM & USSD), NETC, phasing out ECS with NACH, BBPS have spiked up geometrically the number of digital transactions, and more importantly more options to its customers.

The way RBI/NPCI classifies our payment systems/options is (a) Paper (b) Electronic (c) Card Based Payments.

(a) Fast Payments & Retail: These payment options are typically used by individuals to perform P2P payments (or payments-to-merchants) and most importantly low-ticket transactions. The settlement of these transactions happens instantaneously.

(b) Clearing & Large value Payments: These options are used by individuals or businesses to perform large value payments, and usually the money transfer across in a delayed fashion. Delayed here implies, that the settlement between the accounts/banks happen in at defined settlement timings. ACH & Cheque are a classic example of delayed settlements



Risks and E-payment Systems:

Risks in Electronic Payment systems

- **Customer's risks**

- Stolen credentials or password
- Dishonest merchant
- Disputes over transaction
- Inappropriate use of transaction details

- **Merchant's risk**

- Forged or copied instruments
- Disputed charges
- Insufficient funds in customer's account
- Unauthorized redistribution of purchased items

- **Main issue: Secure payment scheme**

Electronic payments Issues

- Secure transfer across internet
- High reliability: no single failure point
- Atomic transactions
- Anonymity of buyer
- Economic and computational efficiency: allow micropayments
- Flexibility: across different methods