



Electronic Payment Systems



LEARNING OBJECTIVES

- To understand what is Electronic payment systems
- To know the various types of E-payment methods
- To learn the basics of
 - Card Based Payment Systems
 - Electronic Account Transfer
 - Electronic Cash Payment Systems
 - Mobile Payment and Internet Payment Systems

16.1 Introduction to Electronic Payment systems

Everyday people buy or sell goods and services for money. Money becomes the major medium of exchange. Later some payment systems were developed out of a need to facilitate the growth of commerce and economic development.

The media used for transferring the value of money is very diversified, ranging from the use of simple payment instruments (e.g. cash) to the use of complex systems (e.g. cryptocurrency). Physical money (cash), is the traditional and most widely used payment instrument that consumers use, in their daily lives to buy goods and services.

As the volume and variety of transactions expands, the volume of money also expand. Using cash for each of large transactions is neither feasible nor practically possible. Security and transportation problems arise in cases where large amounts of cash transactions are involved.

Banks would support in such cases by offering other payment methods. The cashless society has been discussed for long time. The demise of cash and cheques could not be sudden. Though old habits hardly die, people do not hesitate adapting new things.

Definition

An Electronic payment system is a financial arrangement that consists of an intermediary to facilitate transfer of money-substitute between a payer and

a receiver. Sometimes it is also called liquidation, clearing system or clearing service. It ensures the transfer of value from one subject of the economy to another and plays an important role in modern monetary systems.

Modern payment systems may be physical or electronic and each has its own procedures and protocols that guide the financial institution with payment mechanisms and legal systems. Standardization has allowed some of these systems to grow globally.

The term electronic payment refers to a payment made from one bank account to another bank account using electronic methods forgoing the direct intervention of bank employees.

Payment system is an essential part of a company's financial operations. But it becomes complex, when many different payment systems are used. Further challenges come from the continuous introduction of newer payment systems such as paytm, UPI, bitcoin and various mobile payment options. As a result there are more than 750 payment systems throughout the world. See Figure 16.1



Figure 16.1 Electronic Payment Systems

16.2 Classification of Electronic Payment methods

Many electronic payment methods have been developed with the advancements in the Internet technologies. Based on the value of money transactions, processing time, processing requirements, security issues and usability, electronic Payment systems are generally classified into two types. They are

- Micro electronic Payment Systems
- Macro electronic Payment Systems

16.2.1 Micro electronic Payment Systems

It is an on-line payment system designed to allow efficient and frequent payments of small amounts. In order to keep transaction costs very low, the communication and computational costs are minimized here. Unlike macro electronic payments, which use expensive public key cryptography, micro electronic payment are relaxed by using light weight cryptographic primitives and off-line payment verifications.

As the security of micro electronic payment systems is comparatively low it can be tampered but, the cost of fraud is much higher than the possible value to be gained by fraud itself. So the security in micro electronic payment methods is considered to be adequate. The majority of micro electronic payment systems are designed to pay for simple goods on the Internet. e.g., subscriptions of online games, read journals, listen to a song or watch a movie online etc.



In general, the parties involved in the micro on-line payments are Customer, Service Provider and Payment processor. The Micro electronic payment transactions can be explained in the following way.

Step 1 Customer proves his authentication and the payment processor issues micro payments.

Step 2: Customer pays the micro payments to the online service provider and gets the requested goods or services from them.

Step 3: Service provider deposit micro payments received from the customer to the payment processor and gets the money.

16.2.2 Macro electronic payment systems

Macro electronic payment systems support payments of higher value. The security requirements are more rigorous in macro payment systems because of huge money transactions. Banks will impose a minimum transaction overhead on macro payment systems. These transactional overheads for the usage of computationally expensive cryptographic operations prevent these payment systems to be used for the payment of small amounts. Some of the popular macro on-line payment systems are mentioned below

- Card based payment systems
- Electronic account transfer
- Electronic cash payment systems
- Mobile payment systems and internet payment systems

16.3 Card Based Payments Systems

Payment cards are plastic cards that enable cashless payments. They are simple embossed plastic card that authenticates the card holder on behalf of card issuing company, which allows the user to make use of various financial services. More than 90% of online payments are card based payments, at the same time other e-payment methods are also gaining importance now-a-days.

Based on the transaction settlement method there are three widely used card based payment systems. They are

1. Credit card based payment systems (pay later)
2. Debit card based payment systems (pay now)
3. Stored value card based payment systems (pay before)

16.3.1 Credit Card

Credit card is an electronic payment system normally used for retail transactions. A credit card enables the bearer to buy goods or services from a vendor, based on the cardholder's promise to the card issuer to payback the value later with an agreed interest. Every credit card account has a purchase limit set by the issuing bank or the firm. A credit card is different from a debit card where the credit card issuer lends money to customer instead of deducting it from customer's bank account instantly.

The term credit card was first mentioned in 1887 in the sci-fi novel "Looking Backward" by Edward Bellamy. The modern credit cards concept was

born in the U.S.A, in the 1920s, when private companies began to issue cards to enable their customers to purchase goods on credit within their own premises.



In February 1950, Frank McNamara and Ralph Schneider created The Diners Club card which was made of paper-cardboard. Initially The card was accepted in only 27 restaurants and was used only by friends and acquaintances of the two founders (approximately 200 people). Later it was enhanced and accepted worldwide. From 1955, the card was made of plastic. The Diners Club still exists today under the name Diners Club International.



Advantages of credit card

- Most credit cards are accepted worldwide.
- It is not necessary to pay physical money at the time of purchase. The customer gets an extra period to pay the purchase.
- Depending on the card, there is no need to pay annuity.
- Allows purchases over the Internet in installments.
- Some issuers allows “round up” the purchase price and pay the difference in cash to make the transactions easy.

Key players in operations of credit card

1. Bearer: The holder of the credit card account who is responsible for payment of invoices in full (transactor) or a portion of the balance (revolver) the rest accrues interest and carried forward.
2. Merchant: Storekeeper or vendor who sell or providing service, receiving payment made by its customers through the credit card.
3. Acquirer: Merchant's bank that is responsible for receiving payment on behalf of merchant send authorization requests to the issuing bank through the appropriate channels.
4. Credit Card Network: It acts as the intermediate between the banks. The Company responsible for communicating the transaction between the acquirer and the credit card issuer. These entities operate the networks that process credit card payments worldwide and levy interchange fees. E.g. Visa, MasterCard, Rupay
5. Issuer: Bearer's bank, that issue the credit card, set limit of purchases, decides the approval of transactions, issue invoices for payment, charges the holders in case of default and offer card-linked products such as insurance, additional cards and rewards plan. See Figure 16.2

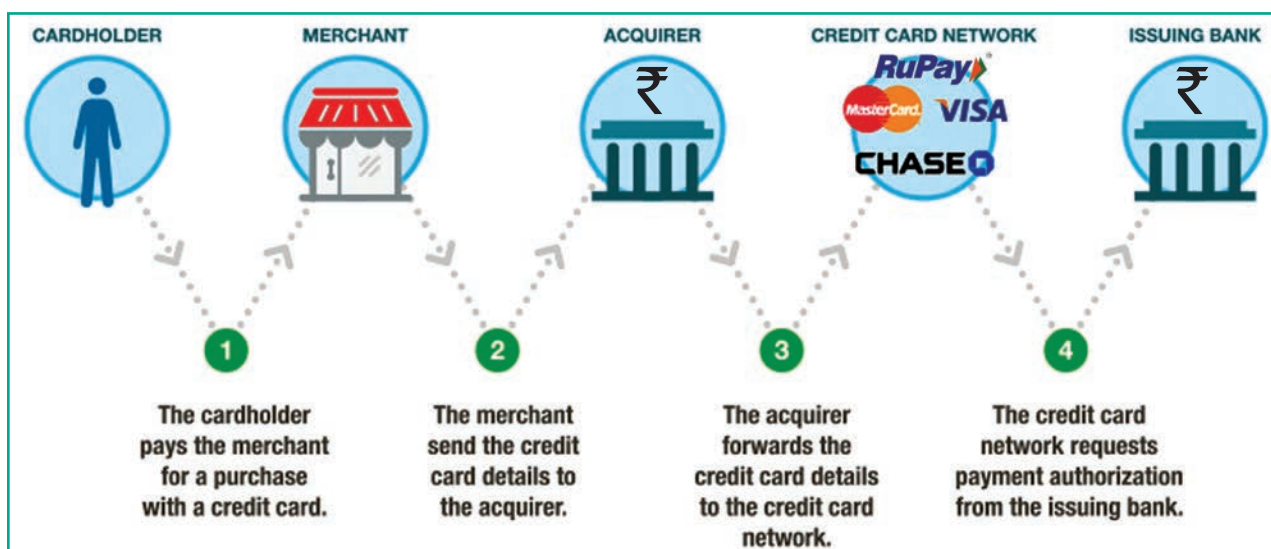


Figure 16.2 Key players of Credit card transaction

Anatomy of a credit card

All Payment cards (including debit card) are usually plastic cards of size 85.60 mm width × 53.98 mm height, rounded corners with a radius of 2.88 mm to 3.48 mm and thickness of 0.76 mm. These standards dimensions are maintained universally in accordance with ISO/IEC 7810#ID-1. See Figure 16.3

- 1. Publisher:** Emblem of the issuing bank (along with the sub category or scheme if any)
- 2. Credit card number:** The modern credit card number has 16-digit unique identification number.
 - The first digit of the credit card number is Major Industry Identifier (MII). It identifies the

issuer category. e.g. 1 – Airlines, 4 – Banks

- The next 5 digits uniquely identifies the issuing organization.
 - The first 6 digits together called as Issuer Identifier number (IIN) or Bank Identification number (BIN)
 - The next 9 digits are the account number.
 - The last digit is a check digit (based to the Luhn algorithm).
- 3. Name of the cardholder:** It is visibly embossed on the front side (additionally stored on the magnetic stripe) some cards like gift cards do not hold any name.

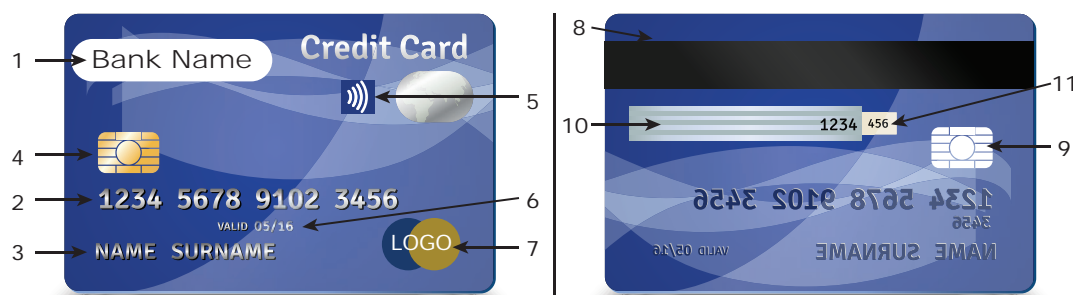


Figure 16.3 Credit Card



4. EMV chip: It is integrated chip in addition to magnetic stripe to store cardholder's information. EMV stands for Europay, MasterCard, Visa. These three names correspond to the names of the companies which are responsible to develop this technology. It is categorized into Chip-and-Signature and Chip-and-PIN.
5. RFID symbol: It is four curved lines radiating rightwards similar to a tilted Wi-Fi symbol. It indicates that it is a contactless smartcard.
6. Expiration month and year: It is visible on the front side (also stored on the magnetic stripe or chip). The card is valid until the last day of the month printed on it.
7. Card brand logo: It is the name of the credit card network company. Visa and MasterCard are leading credit card network companies. Rupay is Indian domestic open loop card launched in 2012.
8. Magnetic stripe: It is an iron based magnetic material containing encrypted data about the card holder and account number.
9. Hologram: Hologram is a security feature that prevents duplication. It is a 3-dimensional image formed by interference of light beams.
10. Signature: It is cardholder's signature at the back of the card, used as an attempt to identify cardholder's identity. It also holds the last 4 digits of card number.
11. CVC/CVV: Card Verification code/value is a 3 digit code usually printed to the left of signature pane validates the card. CVC2 is used in contact less transactions.

Apart from the these mentioned each credit card may also holds issuer's disclaimer, address and phone number.

16.3.2 Debit Card

Debit Card is an electronic payment card where the transaction amount is deducted directly from the card holder's bank account upon authorization. Generally, debit cards function as ATM cards and act as a substitute for cash. The way of using debit cards and credit cards is generally the same but unlike credit cards, payments using a debit card are immediately transferred from the cardholder's designated bank account, instead of them paying the money back at a later with added interest. In modern era the use of debit cards has become so widespread.

The debit card and credit card are identical in their physical properties. It is difficult to differentiate two by their appearance unless they have the term credit or debit imprinted.

Currently there are three ways of processing debit card transactions:

1. EFTPOS (also known as online debit or PIN debit)
2. Offline debit (also known as signature debit)
3. Electronic Purse Card System

16.3.3 Stored value cards

Stored value card is a type of debit card that is pre-loaded with certain amount(value), with which a payment is made. It is a card that has default monetary value onto it. The card may be disposed when the value is used, or recharged to use it again. The major advantage of stored value card is that customers don't need to have a bank account to get prepaid cards. See Figure 16.4



Figure 16.4 Stored value card

Like a credit card or debit card it is a plastic and has a magnetic strip on its back. The magnetic strip stores the monetary value of the card. Stored value cards may not have the card holder's name always. It is also indistinguishable from a regular credit or debit card in appearance. What look like a credit card or debit card act like a credit or debit card. It is used to make purchases offline and online in the same way as in credit card or debit card.

There are two varieties for stored value card.

1. Closed loop (single purpose)

In closed loop cards, money is metaphorically stored on the card in the form of binary-coded data. Closed loop cards are issued by a specific merchant or merchant group and can only be used to make purchases from specific place. e.g. chennai metro rail travel card.

2. Open loop (multipurpose)

Open loop cards can be used to make debit transaction at variety of retailers. It is also called as prepaid-debit cards.

It can be used anywhere the branded cards are accepted. e.g. Visa gift cards.



In some countries it is legal for anyone to enter or leave the country with money that is stored on cards, unlike carrying cash in high amounts which is believed a form of money laundering.

16.3.4 Smart card

The modern version of card based payment is smart cards. Smart cards along with the regular features of any card based payment system holds a EMV chip. This chip is similar to well-known sim card in appearance but differ in its functionalities. The advantage of Smart cards is that it can provide identification, authentication, data storage and application processing. Smart cards can be classified into Contact smart cards and Contactless smart cards. See Figure 16.5



Figure 16.5 Contact Smart card & POS

1. Contact smart cards

Contact smart cards have a contact area of approximately 1 square centimeter, comprising several gold-plated contact pads. These pads provide electrical connectivity only



when inserted into a reader, which is also used as a communications medium between the smart card and a host. e.g. a point of sale terminal(POS).

2. Contactless smart cards

Contactless smart card is empowered by RF induction technology. Unlike contact smart cards, these cards require only near proximity to an antenna to communicate. Smart cards, whether they are contact or contactless cards do not have an internal power source. Instead, they use an inductor to capture some of the interrupting radio-frequency signal, rectify it and power the card's processes. See Figure 16.6

16.4 Electronic Account Transfer

Apart from card based payment systems there are many alternative electronic payment systems. With the advent of computers, network technologies and electronic communications a large number of alternative electronic payment systems have emerged. These include

ECS (Electronic Clearing Services), EFT (Electronic funds transfers), Real Time Gross Settlement system (RTGS) etc. These Electronic Payment systems are used in lieu of tendering cash in domestic and international transactions.

16.4.1 Electronic Clearing Services (ECS)

Electronic Clearing Service can be defined as repeated transfer of funds from one bank account to multiple bank accounts or vice versa using computer and Internet technology. The payer instructs the bank to debit from his bank account and credit it to one or more payee bank account provided amounts and dates of the payments earlier. This system provides the convenience of paperless payments.

Advantages of this system are bulk payments, guaranteed payments and no need to remember payment dates. It can be used by institutions for making payments such as disbursing of salary, pension or dividend interest among shareholders. Similarly, individual bank customers also can make small value repetitive payments such as paying EMI



Figure 16.6 Contactless smart card

117953001IMPHAL TREASURY		Pension Mar 14	79500200210929179284	0000027333300000263326490014032014	
2279500200410	30802619437	MD. NIZAMUDDIN	7950020027953001IMPHAL TREASURY	111300424	0000000679500
2279502750310	0256010370585	KSH. GOURAHARI SINGH	7950020027953001IMPHAL TREASURY	111300073	0000001113800
2279500200510	20110107326	SMT. KH. (O) JAMUNA DEVI	7950020027953001IMPHAL TREASURY	SF15333	0000001682100
2279500200210	33327312824	MD. ABDUR RASHID	7950020027953001IMPHAL TREASURY	111300691	0000000660300
2279502750810	0353010711982	SHRI. Y. CHANDRA SINGH	7950020027953001IMPHAL TREASURY	111300108	0000001253700
2279502700510	0652011110757	S. (O) KHINU	7950020027953001IMPHAL TREASURY	111300797	0000001633900
2279500200310	30768413092	SHRI. S. MANGI SINGH	7950020027953001IMPHAL TREASURY	111300185	0000000853100
2279500251210	30398264706	SHRI. Y. NABA SINGH	7950020027953001IMPHAL TREASURY	111300049	0000000779800
2279500200210	20118607978	SHAKILA BANU	7950020027953001IMPHAL TREASURY	141300044	0000000674200
2279502750810	0353010514328	M. AMUTOMBI SINGH	7950020027953001IMPHAL TREASURY	111300161	0000001476100
2279500251210	30461271542	S. ACHOUBI DEVI	7950020027953001IMPHAL TREASURY	111300110	0000000669600
2279500200310	30769467354	MD. SAMSURJAMAN	7950020027953001IMPHAL TREASURY	111300231	0000001257600
2279500200410	10383433137	A. TOMBA SINGH	7950020027953001IMPHAL TREASURY	111300635	0000001457000
2279502750310	0256010107588	Y. KENGBA SINGH	7950020027953001IMPHAL TREASURY	111300250	0000001485300
2279500200510	30959004900	R. K. (O) MANITOMBI DEVI	7950020027953001IMPHAL TREASURY	SM27389	0000000594400
2279500200210	30397479938	H. GIRIDHARI SINGH	7950020027953001IMPHAL TREASURY	SM27679	0000001008900
2279500200410	30400787226	MD. SHAJKMALUDDIN	7950020027953001IMPHAL TREASURY	SM27866	0000000931600
2279502750310	0256010110997	N. YADMA SINGH	7950020027953001IMPHAL TREASURY	111300251	0000001280100
2279502750810	0353010113657	KH. SHAMUNGOU SINGH	7950020027953001IMPHAL TREASURY	111300162	0000000560000
2279500200310	10329816579	TH. MANITABU SINGH	7950020027953001IMPHAL TREASURY	111300854	0000000703900
2279500251210	11746727786	TH. SHAKNACHA DEVI	7950020027953001IMPHAL TREASURY	111300117	0000001040500
2279500200510	33001695441	L. GOURAKISHORE SINGH	7950020027953001IMPHAL TREASURY	SM30541	0000000641900
2279500200510	30428180642	Y. KONDUM SINGH	7950020027953001IMPHAL TREASURY	SM30908	0000000679500
2279500200410	30179324417	MD. FAJLUR RAHAMAN	7950020027953001IMPHAL TREASURY	111300866	0000000856400
2279502750810	10624	N. DORENDRO SINGH	7950020027953001IMPHAL TREASURY	111300178	0000000958700
2279500200310	20060199403	SMT. M (O) ASHANGBI DEVI	7950020027953001IMPHAL TREASURY	SF14502	0000000632600
2279500251210	11746732956	MD. JALLALUDDIN	7950020027953001IMPHAL TREASURY	111300197	0000000844500

Sample R-ECS file

Sample R-ECS file

Figure 16.7 ECS

of a loan, electricity bills, telephone bills, insurance premium, as well as SIP investments. See Figure 16.7

ECS can be used for both credit and debit purposes i.e. for making bulk payments or bulk collection of amounts.

- **ECS credit:** ECS credit is used for making bulk payment of amounts. In this mode, a single account is debited and multiple accounts are credited. This type of transactions are Push transactions. Example: if a company has to pay salary to its 100 employees it can use ECS credit system than crediting every employees' account separately.
- **ECS debit:** ECS debit is an inverse of ECS credit. It is used for bulk collection of amounts. In this mode, multiple accounts are debited and then a single account is credited. This type of transactions are Pull transactions. Example: The insurance premium of bulk number of customers is debited from customer's bank account on their prior consent and paid to insurance company.



EFT is known by a number of names across countries. In India, it is called as N-EFT (National Electronic Fund Transfer), in the United States, they may be referred to as “electronic cheques” or “e-cheques”. National Electronic Funds Transfer (NEFT) is an electronic funds transfer system initiated by the Reserve Bank of India (RBI) in November 2005. It is established and maintained by Institute for Development and Research in Banking Technology (IDRBT). NEFT enables a bank customer to transfer funds between any two NEFT-enabled bank accounts on a one-to-one basis. It is done via electronic messages. Unlike RTGS, fund transfers through the NEFT do not occur in real-time basis.



16.4.2 Electronic Funds Transfer

Electronic Funds Transfer (EFT) is the “electronic transfer” of money over an online network. The amount sent from the sender's bank branch is credited to the

receiver's bank branch on the same day in batches. Unlike traditional processes, EFT saves the effort of sending a demand draft through post and the inherent delay in reaching the money to the receiver. Banks may charge commission for using this service. EFT is a widely used method for moving funds from one account to another in B2B business models.

16.4.3 Real Time Gross Settlement:

Real Time Gross Settlement system (RTGS) is a payment system particularly used for the settlement of transactions between financial institutions, especially banks. As name indicates, RTGS transactions are processed at the real-time. RTGS payments are also called as push payments that are initiated ("triggered") by the payer. RTGS payments are generally large-value payments, i.e. high-volume transactions.

DO YOU KNOW? The development and maintenance of NEFT or RTGS systems worldwide is driven primarily by the central bank of a country. (RBI in India)

Real-time gross settlement transactions are:

- Unconditional - the beneficiary will receive funds regardless of whether he fulfills his obligations to the buyer or whether he would deliver the goods or perform a service of a quality consistent with the order.
- Irrevocable - a correctly processed transaction cannot be reversed and its money cannot get refunded (the so-called settlement finality).

16.4.4 Electronic wallets

Electronic wallets (e-wallets) or electronic purses allow users to make electronic transactions quickly and securely over the Internet through smartphones or computers. The electronic wallet functions almost the same as a physical wallet in term that it holds our money. Electronic wallets were first recognized as a method for storing money in electronic form, and became popular because it provides a convenient way for online shopping.

With the development of advanced Internet, the use of electronic wallets turned out as an efficient transaction tool. This is evidenced by the many E-Commerce websites that use electronic wallets as a transaction tool. There are several electronic wallet services that are now widely used. e.g. : PayPal, SBI Buddy. See Figure 16.8

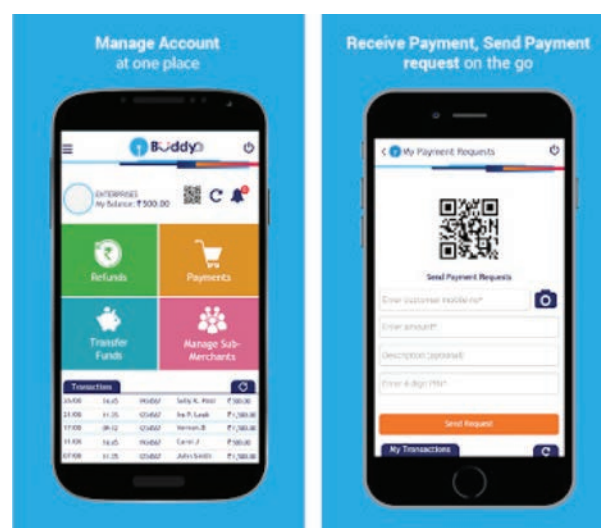


Figure 16.8 e-wallets

16.5 Mobile Banking and Internet Banking

As smartphones have already usurped the place of digital camera and voice recorders, soon it will double up as virtual

debit cards. It enables to send or receive money instantly without any plastic cards.

16.5.1 Mobile Banking

Mobile banking is another form of net banking. The term mobile banking (also called m-banking) refers to the services provided by the bank to the customer to conduct banking transactions with the aid of mobile phones. These transactions include balance checking, account transfers, payments, purchases, etc. Transactions can be done at anytime and anywhere. See Figure 16.9



Some of the latest mobile banking applications even have a cash withdrawal menu. The menu will create a specific code that can be used instead of an ATM card to operate an ATM. However, this can only be done at a special ATM (ATM with no card service).

The WAP protocol installed on a mobile phone qualifies the device through

an appropriate application for mobile session establishment with the bank's website. In this way, the user has the option of permanent control over the account and remote management of his own finances.

Mobile Banking operations can be implemented in the following ways:

- contacting the call center.
- automatic IVR telephone service.
- using a mobile phone via SMS.
- WAP technology.
- Using smartphone applications.

16.5.2 Internet banking

Internet banking is a collective term for E-banking, online banking, virtual banking (operates only on the Internet with no physical branches), direct banks, web banking and remote banking.

Internet banking allows customers of a financial institution to conduct various financial transactions on a secure website

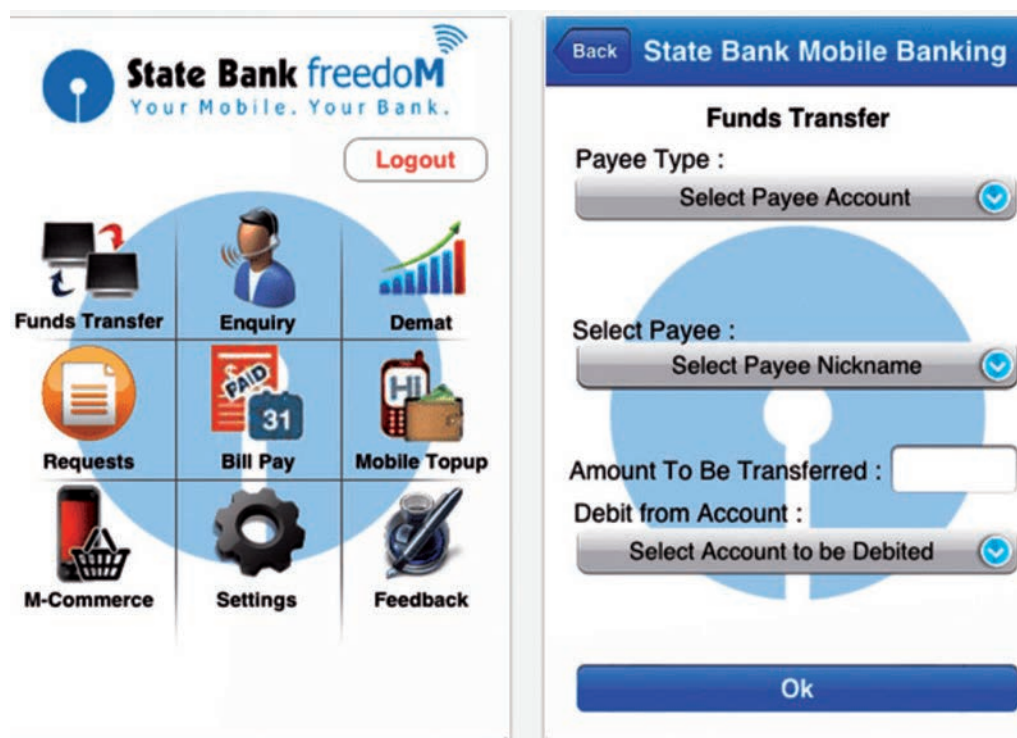


Figure 16.9 mobile banking through smartphone application

operated by the banking institutions. This is a very fast and convenient way of performing any banking transactions. It enables customers of a bank to conduct a wide range of financial transactions through its website. In fact, it is like a branch exclusively operating of an individual customer. The online banking system will typically connect to the core banking system operated by customers themselves (Self-service banking).

Advantages:

- The advantages of Internet banking are that the payments are made at the convenience of the account holder and are secured by user name and password. i.e. with Internet access it can be used from anywhere in the world and at any time.
- Any standard browser (e.g. Google Chrome) is adequate. Internet banking does not need installing any additional software.
- Apart from regular transactions, Internet banking portal provides complete control over all banking demands such as available balance,

transaction statements, recent transactions, bill payment, blocking a card in case of theft or loss, information about other bank products like payment cards, deposits, loans etc.



The following are the steps to transfer fund using net banking.

Step 1: Login to net banking account using unique user name and password provided by the bank earlier.

Step 2: Add the beneficiary as a payee to enable transfer of fund. The following details like Account Number, Name, IFSC about the beneficiary are to be filled in the 'Add New Payee' section.

Figure 16.10 Home page of SBI Internet banking

Step 3: Once the beneficiary is added, choose RTGS / NEFT / IMPS as mode of Fund Transfer.

Step 4: Select the account to transfer money from, select the payee, enter the amount to be transferred and add remarks (optional).

Step 5: Click on submit.

Step 6: Enter the OTP received to mobile number linked to the corresponding account to complete the transaction.

Modern Electronic funds transfers are secured by a personal identification number (PIN), one-time password (OTP) etc. An automated clearing house (ACH) processes the payment then. See Figure 16.10

DO YOU KNOW? Indian Financial System Code (IFSC) is an 11 digit alpha-numeric code issued by Reserve Bank of India to uniquely identify individual bank's branch in India. It is used for domestic e-payments. SWIFT code is used for international bank transactions.

16.6 Unified Payments Interface

Unified Payments Interface (UPI) is a real-time payment system developed by National Payments Corporation of India (NCPI) to facilitate inter-bank transactions. It is simple, secure and instant payment facility. This interface is regulated by the Reserve Bank of India and used for transferring funds instantly between two bank accounts through mobile (platform) devices. <http://www.npci.org.in/>

Unlike traditional e-wallets, which take a specified amount of money from user and store it in its own account, UPI withdraws and deposits funds directly from the bank account whenever a transaction is requested. It also provides the “peer to peer” collect request which can be scheduled and paid as per requirement and convenience.

UPI is developed on the basis of Immediate Payment Service (IMPS). To initiate a transaction, UPI applications use two types of address - global and local.

- Global address includes bank account numbers and IFSC.
- Local address is a virtual payment address.

Virtual payment address (VPA) also called as UPI-ID, is a unique ID similar to email id (e.g. name@bankname) enable us to send and receive money from multiple banks and prepaid payment issuers. Bank or the financial institution allows the customer to generate VPA using phone number associated with Aadhaar number and bank account number. VPA replaces bank account details thereby completely hides critical information.

The MPIN (Mobile banking Personal Identification number) is required to confirm each payment. UPI allows operating multiple bank accounts in a single mobile application. Some UPI application also allows customers to initiate the transaction using only Aadhaar number in absence VPA.



UPI is also available as an Unstructured Supplementary Service Data (USSD) service. Users who don't have Internet can dial *99# and get UPI services within India. The financial services like transferring fund, payment request and non-financial services like changing MPIN and balance check are currently available through the USSD.



Advantages

- Immediate money transfers through mobile device round the clock 24 x 7.
- Can use single mobile application for accessing multiple bank accounts.
- Single Click Authentication for transferring of fund.
- It is not required to enter the details such as Card no, Account number, IFSC etc. for every transaction.
- Electronic payments will become much easier without requiring a digital wallet or credit or debit card.

16.7 Cash on delivery

Cash on delivery (COD) also called as collection on delivery, describes a mode of payment in which the payment is made only on receipt of goods rather in advance. Originally, the term applies only to cash

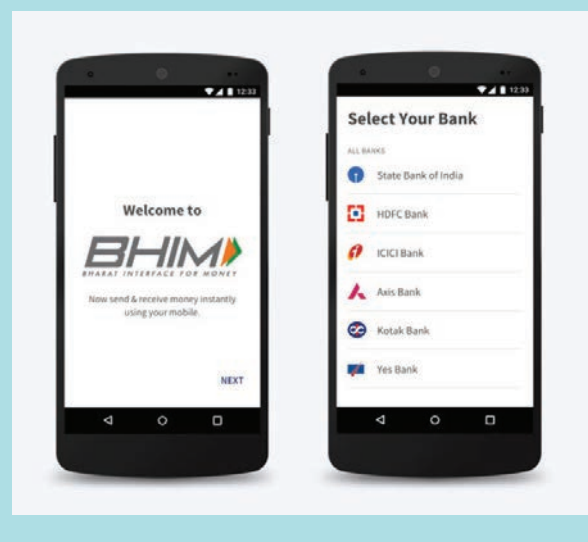
payment, but since other forms of payment have become more common, the word “cash” has sometimes been replaced by the word “collect” to transactions with checks, credit cards or debit cards.

COD is often used as an additional payment option in E-Commerce. It offers the recipient the advantage of paying only when commodity is handed over that is likely similar to traditional system. If the goods are not paid, they are returned to the retailer.



Bharat Interface for Money (BHIM)

Individual banks and financial institutions build and maintain their own mobile application for UPI transaction. Bharat Interface for Money (BHIM) is an exclusive mobile app for UPI developed by National Payments Corporation of India (NPCI) and launched on 30 December 2016. It is intended to facilitate e-payments directly through banks and drive towards cashless transactions.



POINTS TO REMEMBER

- Payments are the financial instruments used globally to transfer value in the form of money or its substitutes and are constantly changing due to new technology and Government regulations.
- Payment system can also be divided into two types, namely the cash payment system and the non-cash payment system based on the instruments used. In the cash payment system, the instruments used are in the form of currency (paper money and coins) while in the non-cash payment system the instruments used are card-based payment, Cheques or electronic money.
- A Credit card plays a major role in electronic payment system worldwide.
- ECS is treated as a electronic cheques by the bank. The advantages and disadvantages of the physical cheque is also extended to ECS. In electronic clearing services, bank process the instructions from the customer to debit his account and pay another automatically without much human interference.
- (POS) Point of Sale Terminal- It enables customers to make payment for purchase of goods and services by means of credit and debit cards. To facilitate customer convenience some banks also cash withdrawal using debit cards at POS terminals.

A-Z GLOSSARY

BIN	Bank Identification Number. The first six-digits of credit card number to uniquely identify financial institutions.
Brick and mortar	The term that refers to a business that has a physical store; opposite of online store.
(CVC2/CVV2)	Card Verification Code and Card Verification Value : A three digit code printed on the cardholder signature panel allows e-payments when the card is not physically accessible.
Credit card network / processor	Company responsible for communicating the transaction between the acquirer and the credit card issuer. E.g. MasterCard, Visa, Rupay
Double spend	A type of fraud where same cryptocurrency is spent in more than one transactions.
E-wallets	Electronic purses allow users to make electronic transactions quickly and securely
Gift cards	A magnetic stripe or chip card that holds the value of money to offer as a gift by a E-business
Internet banking	Is the activity of buying or selling of commodities through online services or over the Internet
PIN	Personal Identification Number. A static number that is assigned to consumers to secure card based payments.
Point of sale (POS)	Merchant's electronic device that enables the e-payments. It reads the card information from EMV or magnetic strip



Where? Write
How? Explain
Where? Write
Which? What? When?
How? What? When?
Write When?

EVALUATION



Part - I

Choose the correct answer

1. Based on the monetary value a payment system can be classified into
 - a) Micro and Macro
 - b) Micro and Nano
 - c) Maximum and Minimum
 - d) Maximum and Macro
2. Which of the following is not a category of micropayment?
 - a) Buying a movie ticket
 - b) Subscription to e journals
 - c) Buying a laptop
 - d) Paying for smartphone app
3. **Assertion (A):** Micro electronic payment systems support higher value payments.
Reason (R): Expensive cryptographic operations are included in macro payments
 - a) Both (A) and (R) are correct and (R) is the correct explanation of (A)
 - b) Both (A) and (R) are correct, but (R) is not the correct explanation of (A)
 - c) (A) is true and (R) is false
 - d) (A) is false and (R) is true
4. Which of the following is correctly matched
 - a) Credit Cards - pay before
 - b) Debit Cards - pay now
 - c) Stored Value Card - pay later
 - d) Smart card - pay anytime
5. ECS stands for
 - a) Electronic Clearing Services
 - b) Electronic Cloning Services
 - c) Electronic Clearing Station
 - d) Electronic Cloning Station
6. Which of the following is a online payment system for small payments.
 - a) Card based payment
 - b) Micro electronic payment
 - c) Macro electronic payment
 - d) Credit card payment
7. Which of the following is true about Virtual payment address (VPA)
 - a) Customers can use their e-mail id as VPA
 - b) VPA does not includes numbers
 - c) VPA is a unique ID
 - d) Multiple bank accounts cannot have single VPA
8. Pick the odd one in the credit card transaction
 - a) card holder
 - b) merchant
 - c) marketing manager
 - d) acquirer
9. Which of the following is true about debit card
 - i. debit cards cannot be used in ATMs
 - ii. debit cards cannot be used in online transactions
 - iii. debit cards do not need bank accounts
 - iv. debit cards and credit cards are identical in physical properties

- a) i, ii, iii b) ii, iii, iv
c) iii alone d) iv alone

10. Match the following

List A	List B
A1) First Digit	B1) Account number
A2) 9 th to 15 th Digit	B2) MII Code
A3) First 6 Digits	B3) BIN Code
A4) Last Digit	B4) Check digit

	A1	A2	A3	A4
a)	B4	B3	B2	B1
b)	B2	B1	B3	B4
c)	B2	B3	B4	B1
d)	B2	B4	B3	B1

Part - II

Short Answers

1. Define electronic payment system
2. Distinguish micro electronic payment and macro electronic payment
3. List the types of micro electronic payments based on its algorithm

4. Explain the concept of e-wallet
5. What is a credit card network?

Part - III

Explain in Brief Answer

1. Define micro electronic payment and its role in E-Commerce.
2. Compare and contrast the credit card and debit card.
3. Explain briefly Anatomy of a credit card.
4. Briefly explain the stored value card and its types.
5. What is electronic fund transfer?

Part - IV

Explain in detail

1. What is credit card? Explain the key players of a credit card payment system and bring out the merits of it.
2. Briefly explain Electronic Account transfer and its types.
3. Write a note on
 - a. Internet banking
 - b. Mobile banking
4. Write about smart card and type.
5. Explain in detail : Unified payments interface



STUDENT ACTIVITIES

Presentation about various payment systems

- Choose any presentation tool (e.g. Open office impress)
- Create a slide describing a payment method.
- List the futures of the particular payment method.
- List the advantages and disadvantages of the same.
- Repeat the steps for other payment methods.