

BLOCK 2
E-PAYMENT SYSTEM



BLOCK 2 E-PAYMENT SYSTEM

This is the second block of the course “E-Commerce”. This block will familiarise you with the basic introduction to E-payments system, various payment methods and gateways, E banking and various services and facilities offered by e-banking. This block is structured to cover the fundamentals and preliminary aspects of the e-payment system. The block on the theme “E-Payment System” comprises of two units, the details of which are mentioned below:

- **Unit-5:** This unit briefs about the overview, meaning and distinction of e-payment from conventional payment. The unit also explains about the various payment gateways, various steps about functioning of payment gateways as well as the difference types of online payment methods such as credit cards, cyber cash, internet cheques, smart cards e-wallets etc.
- **Unit-6:** This unit makes the learners familiarise with the meaning, concept and importance of E-banking. The unit also discusses the electronic fund transfer methods such as NEFT, RTGS, IMPS, their requirements and distinction with each other. The later part of the unit briefs on the virtual currencies, Automated Clearing House and concept, advantages and uses of Distributed Ledger Technology, etc.



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UNIT 5 E-PAYMENT

Structure

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5.0 OBJECTIVES

After going through this unit, you should be able to:

- understand about the payment system;
- know the difference between Payment system and Electronic Payment system;
- know how government regulate payment system; and
- understand the risks involved in payment system.

5.1 INTRODUCTION

Digital disruption is redefining banking industries and changing the manner businesses functions and bringing paradigm shift in e-business too. Every industry is assessing options and adopting ways to generate value in the technology-driven world. In the present scenario payments are life blood of a business. It is imperative to choose a system that integrates well with your business and meets all your payment needs. Online payments system has turn out to be a part of our daily lives. We are transacting online not only through debit or credit cards but through numerous other modes like UPI, net-banking and wallets or e-wallets as well. Paying online is a fundamental feature that every e-commerce platform in the world offers and India is not an exception to that.

Progressively or rather traditionally, people trade goods and use services by making payments using cash as ready money which was the major medium of exchange in the past. Banks have urbanized a variety of payment methods to make feasible the exchange of money that stimulates the growth of commerce, helps economic development and facilitates flexibility with lower transaction costs with security. A variety of payment systems exist in the present day, ranging from cheques, wire transfer, cards to online transfer, and Unified Payment Interface (UPI). This payment system reconcile financial transactions through the transmission of monetary value. This includes the institutions, instruments, people, rules, procedures, standards, and technologies that make its exchange possible.

In a contemporary world Blockchain technology has been introduced which promises to smoothen the process of fast, secure transaction through the use of encrypted Distributed Ledgers Technology (DLT) that endow with trusted real-time verification of transactions without the need for intermediaries such as correspondent banks and clearing.

In this unit we will discuss different types of payment methods that are available today with banking channels in India which work as a driving force in remittances or alternate banking channels which can be utilized by banks for acquiring, tracking and serving customers through multiple channels. This focuses on fund transfers, third party transfers, utility payments using through banking channels. Features such as AI bots, digital payment advisers and biometric fraud detection mechanisms lead to higher

quality of services to a wider customer base. All this translates to increased revenue, reduced costs and boost in profits.

5.2 OVERVIEW OF PAYMENT SYSTEM

A payment system is any system used to reconcile financial transactions through the transmission of monetary value. This includes the institutions, instruments, people, rules, procedures, standards, and technologies that make its exchange feasible. Some payment systems also consist of credit mechanisms, which are essentially a dissimilar aspect of payment. Payment systems are used in lieu of tendering cash in domestic and global transactions and consist of a major service given by banks and other financial institutions. Customary payment systems take account of negotiable instruments such as drafts (e.g., cheques) and documentary credits such as letters of credit. The present payment system or rather a contemporary payment system straightforwardly integrates point of sale and delivers a robust payment experience for both merchant and customer. It connects merchants to a total payment ecosystem, from merchant services to remote terminal solutions, to hardware. Banks have developed a range of payment methods to make easy the exchange of money that stimulates the expansion of commerce, helps economic development and facilitates elasticity with lower transaction costs with security. Various payment systems exist in the present day, ranging from cheques, wire transfer, cards to online transfer procurement. We will talk about all these omnipresent terminologies which come under the ambit of E-payment system in coming heads in a gradual manner.

5.3 MEANING OF E-PAYMENT

When we purchase goods and services online through an e-commerce portal, we pay for them using an electronic mode which is a preferred mode of payment in present scenario. This method of payment, without using cash or cheques, is called an e-commerce payment system and is also known as online or electronic payment systems.

An electronic payment (e-payment), in short, can basically defined as paying for goods or services on the internet or through gateway to pay amount. It includes all financial operations using electronic devices, such as computers, smartphones or tablets. E-payments can be made in many ways, like credit or debit card payments or bank transfers.

The term electronic payment refers to a payment made from one bank account to another using electronic methods and forgoing the direct intervention of bank employees. Barely defined electronic payment refers to e-commerce in which payment for buying and selling goods or services offered through the Internet, or broadly to any nature of electronic funds transfer.

Modern payment systems use cash-substitutes as compared to traditional payment systems. This includes debit cards, credit cards, electronic funds

transfers, direct credits, direct debits, internet banking, E-wallet, virtual currency using blockchain and e-commerce payment systems. An electronic payment is any kind of non-cash payment that doesn't involve a paper check. Methods of electronic payments include credit cards, debit cards and the ACH (Automated Clearing House) network. The ACH system comprises direct deposit, direct debit and electronic checks (e-checks). Artificial Intelligence is the panorama of banking as it brings the power of advanced data analytics to combat fraudulent transactions and improve compliance. Features such as AI bots, digital payment advisers and biometric fraud detection mechanisms lead to advanced quality of services to a wider customer base.



Fig 5.1: Electronic Payment System

The basic characteristics of e-payment system are applicability, ease of use, security, reliability, trust, scalability, convertibility, interoperability, efficiency, anonymity, traceability, and authorization type.

5.4 DIFFERENCE BETWEEN E-PAYMENT & CONVENTIONAL PAYMENT

The functioning atmosphere of e-payment is based on an open system platform i.e. internet, while the long-established payment is operated in a relatively closed system. E-payment uses most advanced communication means, such as the internet and extranet, whereas, customary payment uses traditional communication media. If we set up with defining a conventional process of payment and settlement involves a buyer-to-seller transfer of cash or payment information (for example, credit card). A cash payment requires a buyer's withdrawal from his bank account, a transfer of cash to the seller, and the seller's deposit of the payment to his account, which is a cumbersome process or rather a tedious time taking approach. We will discuss about the difference with the help of a comparative table in a more elaborative manner to study.

Table 5.1: Difference between Traditional Payment and E-Payment

Sl. NO.	PARTICULARS	TRADITIONAL PAYMENT	E-PAYMENT
1.	Usage	Use Traditional Medium to communicate	Use advance technology to communicate

2.	Circulation	Traditional payment is realized through physical circulation such as cash circulation, bill transfer and bank exchange.	E-payment introduces digital circulation to realize information transmission, so all means of e-payment are digitalized
3.	Requirement	Uses traditional medium to communicate between parties	Requirement network and other related software to work
4.	Intervention	Needs human intervention to settle these processes	Uses advance technology to handle all the transaction process that requires money engagement such as money transfer.
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5.5 PAYMENT GATEWAYS

In our preceding head we have seen that how the online payments are fast and well-situated when we compare with stereotype payment system and on the other hand it is the need of the hour, with a frame of mind to buy products and services by crossing territorial boundaries. If you are a seller, you can put up your product for sale to everybody in the world using a decent internet connection and good bandwidth. The noteworthy factor which works as a driving force over and above the Smartphone is the payment gateway. This particular sub-head is going to answer certain frequently asked questions such as whether it is safe to transact through a payment gateway? Does it make logic for a business to have payment gateway integration? Let's find out by defining the term gateway vis-à-vis payment.

Today, many businesses have moved away from more traditional payment methods (such as direct bank transfer) to payment gateways because they enable instant payment, credibility for merchants, real-time payments, security, among other benefits.

5.5.1 What is a Payment Gateway?

A payment gateway is an online application (characteristically used in e-commerce) that conducts payment authorizations for merchants, electronically based businesses (e-businesses), merchants with mutually brick and mortar locations and online locations and merchants with long-established brick and mortar stores. As long as there is an internet connection, a payment gateway steadily connects to an e-commerce application or in-house payment application such as a credit card processing network or an online banking institution.

Payment gateways are the “middle man,” handling business between merchants and customers serving in a position that steadily withdraws the

funds for a transaction from customers and deposits them into merchant's bank account. A payment gateway is a digital version of the physical point of sale (POS) terminals located in approximately all of today's retail outlets.

For setting up an ecommerce store or selling digital products through a website a payment gateway is a pre-requisite or a mandatory component. Payment gateways are the consumer-facing interfaces which are used to collect payments. A payment gateway is the technology that captures and transfers payment data from the customer to the acquirer. It is used not only by merchants to recognize debit or credit card purchases from customers. The term includes not only the physical card-reading devices found in brick-and-mortar retail stores but also the payment processing portals found in online stores. On the other hand, brick-and-mortar payment gateways in recent years have begun accepting phone-based payments using Near Field Communication (NFC) technology.

Payment gateway is essentially a bridge or connection pathway between the customers and the relevant financial institution. Gateways are a link between the merchant's website and a payment provider or banking network. Essentially, they act as a "wire" that connects the site to a payment provider and allows secure payment data to flow back and forth.

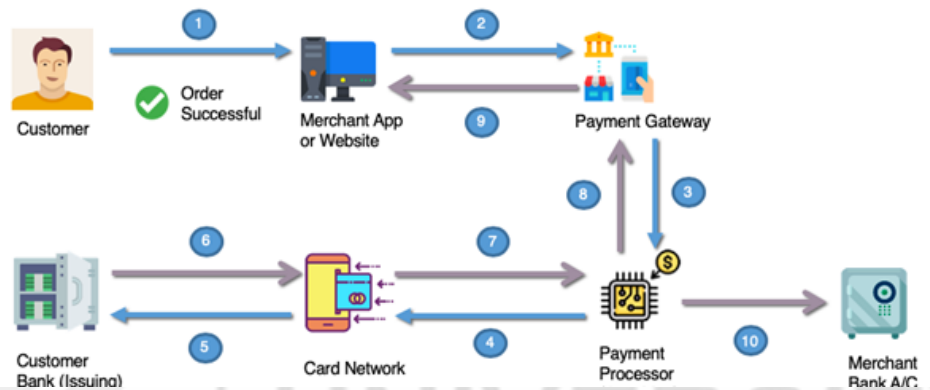


Fig 5.2: Payment Gateways

From the above figure it is well versed that an online payment gateway (PG) is a tunnel that connects the recipient's bank account with a sender's bank account in the platform where money need to transfer. Thus, it is an application software that authorizes to accomplish an online transaction through different payment modes like net banking, credit card, debit card, UPI or the many online wallets that are available these days.

A PG plays the role of a third party that securely transfers your money from the bank account to the merchant's payment portal.

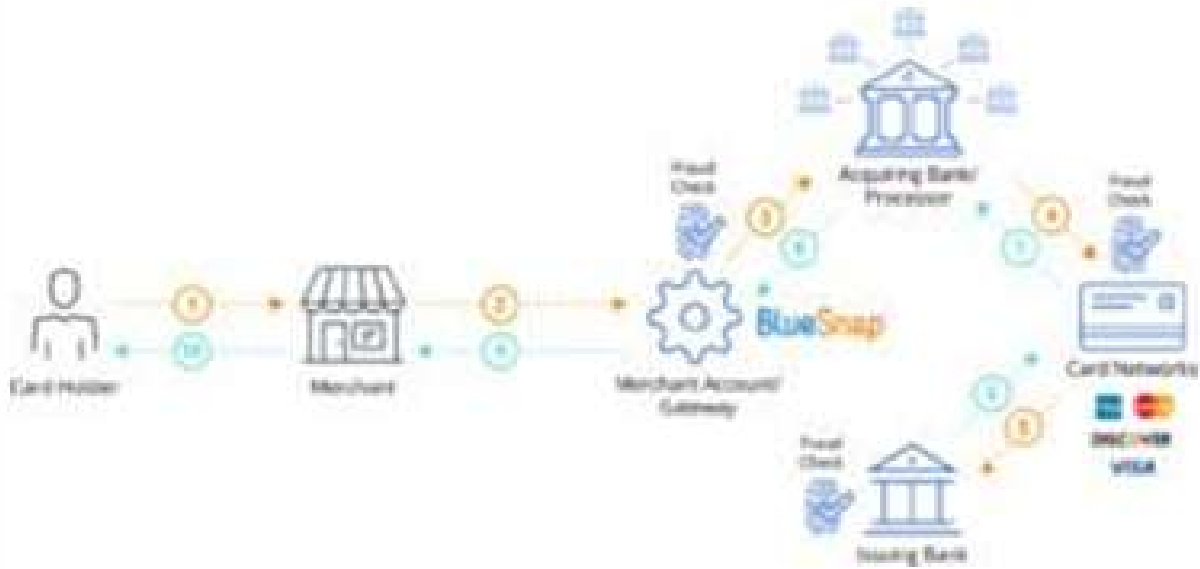


Fig 5.3: Roles of Payment Gateways

5.5.2 Process of Payment Gateway

Before we look deeper the definition of a payment gateway, we need to make out the key players in online payments. When a customer clicks on the “Pay” button on your website, these are the key players involved in the payment process:

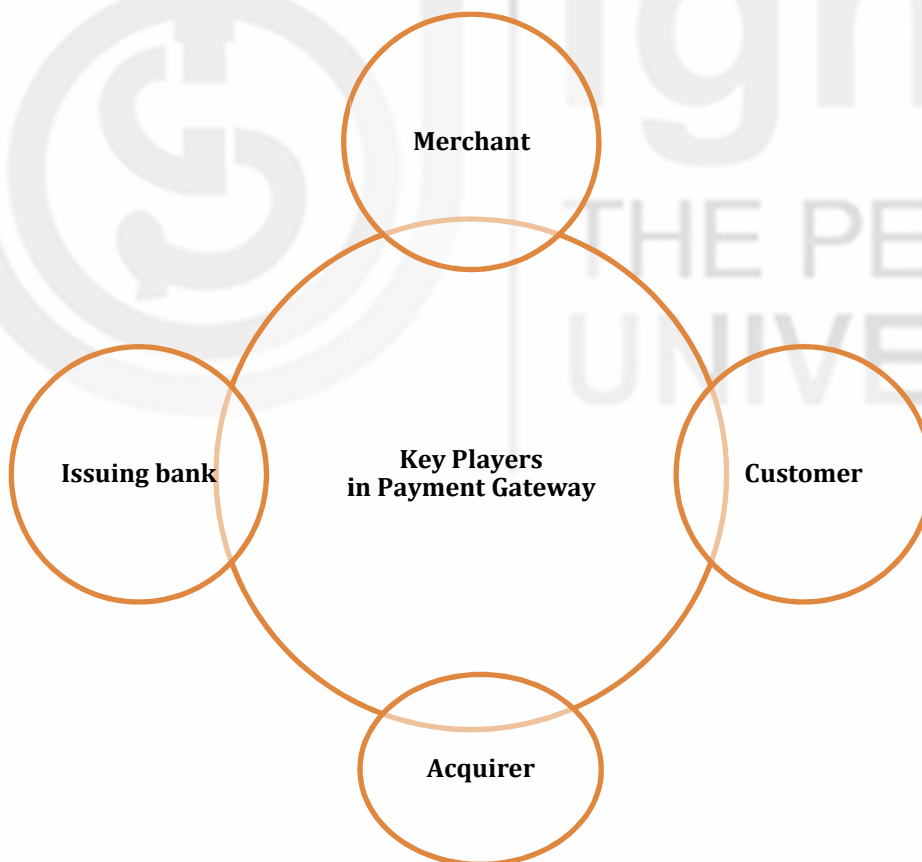


Fig 5.4: Key players in a Payment Gateway

- **Merchant:** An online business operating in any vertical (travel, retail, ecommerce, gaming, Forex, buying, shopping, etc.), offering a product or service to customers.
- **Customer:** Customer also called a cardholder, who wants to access the products or services that the merchant is selling, and initiates the transaction.
- **Issuing bank:** The issuing bank is the customer's bank that issues the card holder's credit or debit card on behalf of the card schemes (Visa, MasterCard).
- **Acquirer:** This also acknowledged as the acquiring bank, the acquirer is the financial institution that maintains the merchant's bank account (known as the merchant's account). The acquiring bank passes the merchant's transactions to the issuing bank to obtain payment.

Thus, from figure 5.3 it is well versed that a payment gateway allows merchants to securely pass credit or debit card or a wallet information between the customer, merchant and the payment processor. The payment gateway is the middleman between the merchant and their sponsoring bank. A payment processor is the company that a merchant uses to handle.

5.5.3 Securing Information through Payment Gateway

In our preceding section we have learnt that how important the payment gateway is. In this section we will ensure that the security of the information you need is saved and much important secure. Online payment security is becoming one of the important issues as in facilities in. Defending customers against attacks over the internet and cyber theft to achieve their trust is becoming very decisive and one of the most vital tasks for business owners. For business owners, it is significant to ensure utmost security measures to safeguard business as well as their customers from the risks in online payments. If a customer trusts an online business and shares payment information, it is the merchant's responsibility to provide a secure and seamless buying experience. Online payment fraud rate is increasing with an alarming rate and may keep on rising.

When setting up a payment gateway on e-commerce site, we will need to make quite a few decisions. Two of the most significant decisions are the type of merchant account we opt and ensuring that the customers' payments are secure. A payment gateway focuses on securing the sensitive information given by the user throughout the process. It ensures security by encrypting data like card and bank details that have been provided by the user in due course. Here is a list of things that a payment gateway carries out to keep the data safe:

- First things first, the entire transaction is carried out through an HTTPS web address. This is unusual from the HTTP as the S in the HTTPS stands for Secure. The transaction takes place throughout this same tunnel.

- As a consequence of the hash function, the system often uses a signed request from the merchant to authenticate the appeal of the transaction. This signed request is a secret word, which merely the merchant and the payment gateway know.
- To secure the payment page result of the process, the IP of the requesting server is verified to perceive any malicious activity.
- Virtual Payer Authentication (VPA) is something that the acquirers, issuers and the payment gateways back to secure the process. VPA, implemented under the 3-D secure protocol, adds an additional layer of security and helps the online buyers and sellers to authenticate.

5.5.4 Example of a Payment Gateway

Credit cards, debit cards, net-banking, e-wallets etc. are ensuring a safe and suitable way attracting more and more customers to buy from the web. Payment gateways are making this easier every day. When any organization establishes an ecommerce business, it should think vigilantly about how to acknowledge payments online to meet user expectations and deal with the cash flow of his/her business viably.

Few example of Payment Gateways are given below:

- CCAvenue's mobile SDKs facilitate smooth and easy integration of payments directly into your iOS, Android or Windows mobile application. Faster payment processing, fewer clicks and intelligent retry feature helps in significantly improving transaction success rate and reducing cart abandonment, thus delivering a beautiful and seamless payment experience.
- Large banks such as Bank of America (BAC) and JPMorgan (JPM) have sophisticated payment gateway systems that they offer to customers along with their own merchant acquiring bank services.
- Snapdeal owned digital payments platform FreeCharge has partnered with a payment gateway CCAvenue to strengthen its offline offerings, as it gains access to over one lakh online merchants across sectors like hospitality, retail and education.
- Flipkart used CCAvenue&PayU but now it's using Payzippy.
- Amazon Pay is vital to provide the same easy, trusted experience to hundreds of millions of Amazon customers

Thus, once a credit card's testimonials has penetrated into the payment section of an e-commerce website, the payment gateway encrypts the perceptive details of the card to secure both the consumer and the merchant from fraudulent activity as the information is passed between the two during their transaction. The payment gateway then routes that information to the merchant's issuing bank for authorization, and then consequently notifies the merchant of the transaction's status (authorized or declined). Last but not least, the payment gateway settles funds with the merchant after the issuing bank settles the funds with the gateway.

Check Your Progress A

1. Fill in the blanks with appropriate words:
 - i) The system comprises direct deposit, direct debit and electronic checks (e-checks).
 - ii) uses traditional medium to communicate, whereas uses advance technology to communicate.
 - iii) E-payment introduces to realize information transmission, so all means of e-payment are digitalized.
 - iv) A payment gateway is a digital version of the physical terminals located in approximately all of today's retail outlets.
 - v) The is the financial institution that maintains the merchant's bank account

2. State whether the following are true or false.
 - i) Online payment fraud rate is increasing with an alarming rate and it will keep on rising for that security could be an important measures.
 - ii) The acquiring bank is the customer's bank that issues the cardholder's credit or debit card on behalf of the card schemes.
 - iii) Payment gateway is essentially a bridge or connection pathway between your customers and the relevant financial institution.
 - iv) Virtual Payer Authentication (VPA) is something that the acquirers, issuers and the payment gateways are backing to secure the process even more.
 - v) Merchant is a cardholder, who wants to access the products or services that the merchant is selling, and initiates the transaction.

3. What is a Payment Gateway?
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4. Who is a merchant in payment gateways?
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5.6 STEPS REGARDING FUNCTIONING OF A PAYMENT GATEWAY

In our preceding section, we have observed that a payment gateway focuses on securing the sensitive information given by the user throughout the process. It is a technology which can be used by merchants to accept debit or credit card purchases from customers. The term includes not only the physical card-reading devices found in brick-and-mortar retail stores but also the payment processing portals found in online stores. It ensures security by encrypting data like card and bank details that have been provided by the user. There are four simple steps in the payment gateway process:

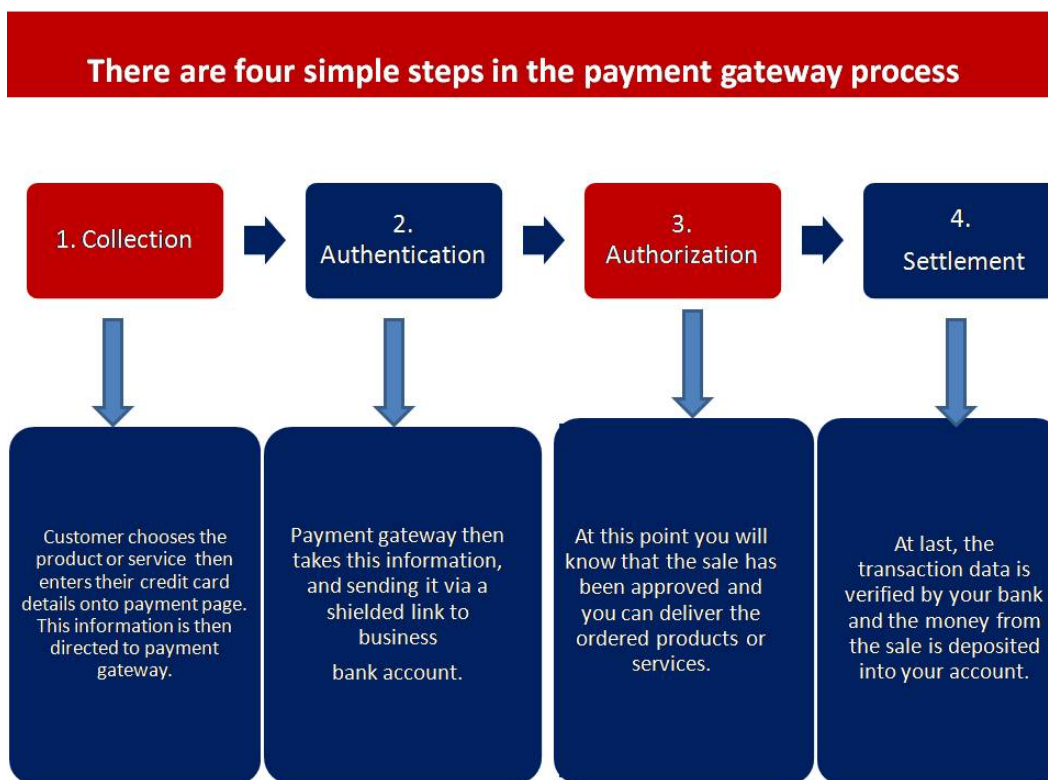


Fig 5.5: Steps about functioning of a payment gateway

5.6.1 Steps Showing a Typical E-Payment System

The following are the basic steps showing how a typical payment gateway works:

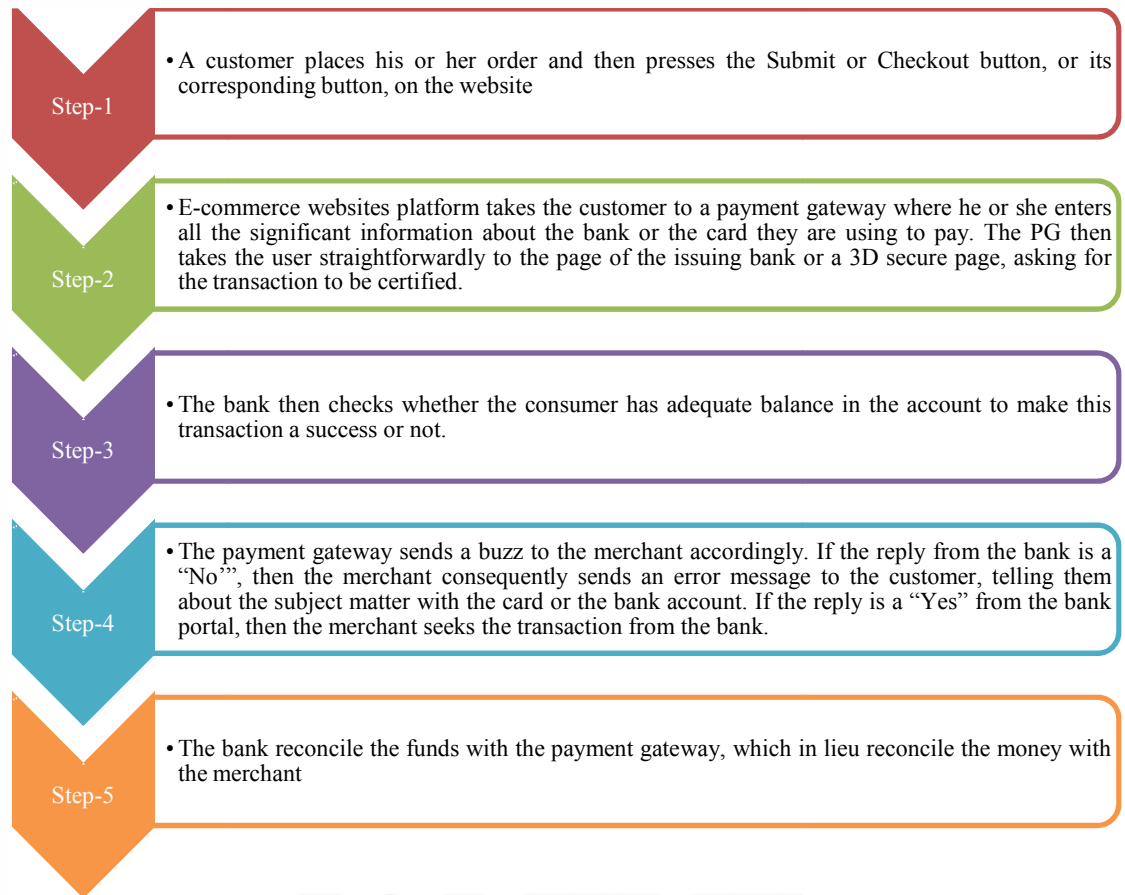


Fig 5.6: Steps showing a typical e-payment system

Once this procedure is completed, the customer gets an authentication message of the order being placed. As mentioned earlier, the transaction of money involves sensitive information about a person’s bank and card details that are entirely personal to him or her. Consequently, it is imperative to make sure that this information stays safe.

5.7 TYPES OF PAYMENT GATEWAYS

We have seen in our previous heads that how a payment gateway work as a merchant service provider and facilitates an e-commerce application service provider that authorizes direct payments processing for e-businesses, online retailers, bricks and clicks, or traditional brick and mortar. The payment gateway may be provided by a bank to its customers, but can offer a dedicated financial service provider as a separate service, such as a payment service provider. Ecommerce payment gateways are used to handle payment transaction services through a secured gateway to make a payment for the customer orders.

The various types of payment Gateways are discussed below:

5.7.1 Hosted Payment Gateways

Hosted payment gateways direct the customer away from the site’s checkout page. When the customer clicks the gateway link, they are redirected to the Payment Service Provider (PSP) page. Here, the customer fills in his or her payment details, and after paying, is redirected back to the website to

complete the checkout process. The most well-known example of a hosted payment gateway is PayPal.

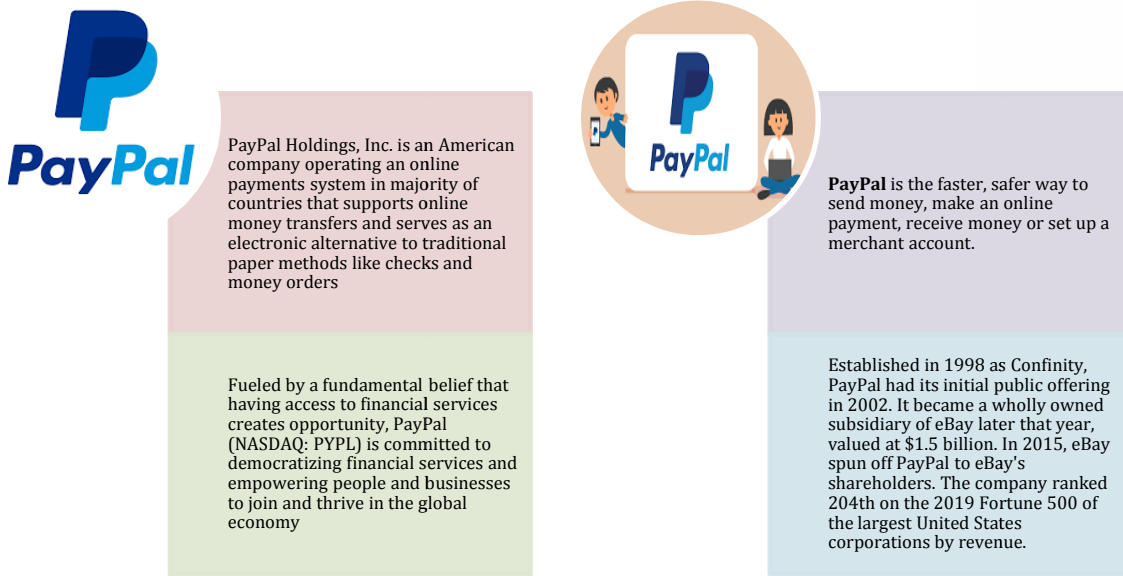


Fig 5.7: Example of Hosted Payment Gateway

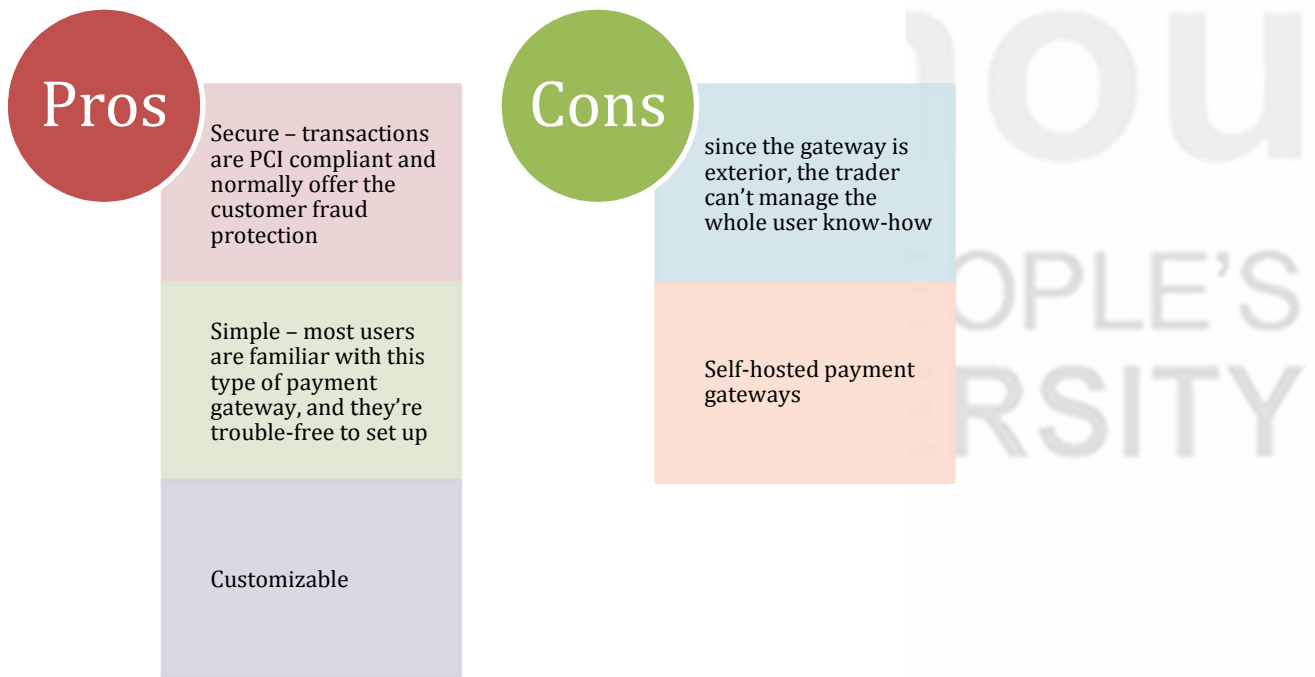


Fig 5.8: Pros and Cons of Hosted Payment Gateways

With this category of gateway, payment details are composed from the customer within the merchant's website. After the details are requested, the collected data is sent to the payment gateway's URL. Some gateways require the payment data be provided in a precise format

5.7.2 Self-Hosted Payment Gateways

With self hosted payment gateways anyone can customise and add new features depending on the business needs and requirements

Pros:

- Good customer experience – the entire transaction is completed in one place.
- Customizable flow – the merchant has control over the payment journey.

Cons:

- No support system- Usually self-hosted gateways do not have a technical support team that you can rely on if the system fails. You would have to figure out how to resolve the problem on your own or hire a professional which could be costly.

5.7.3 API Hosted Payment Gateways

With API hosted payment gateways, customers enter their credit or debit card information directly on the merchant's checkout page and payments are processed using an API (Application Programming Interface) or HTTPS queries.

Pros:

- Customizable – offers full control over the customer experience and UI of the payment journey.
- Capable of integration – can be used with mobile devices, tablets, etc.

Cons:

- Security – merchants are responsible for PCI DSS compliance and purchasing SSL certification.

5.7.4 Local Bank Integration Gateways

Local bank integration gateways redirect the customer to the payment gateway's website (the bank's website) where they enter their payment details and contact details. After making the payment, the customer is redirected back to the merchant website, with payment notification data sent upon redirection.

Pros:

- Quick and easy set up – good for small businesses who need a simple one-time payment structure.

Cons:

- Basic features only – usually doesn't enable returns or recurring payments, so not ideal for wholesalers.

The payment gateway the choose should be dependent on its model, the types of features required, and the amount of control over the business want customers' payment experience.

For online businesses and wholesalers especially, a self-hosted payment gateway offers the most streamlined experience because it allows the customer to complete the transaction from a single page, and offers the

merchant control over the customer experience. And, with QuickBooks Commerce's B2B Payments, you can also have peace of mind that all customer data is protected.

5.8 TYPES OF PAYMENT METHODS

There are various types of payment gateways consumers are using. It can be possible in brick-and-mortar which we usually call physical stores and shopping online which we call click-and-mortar stores. In physical stores, payment gateways consist of the point of sale (POS) terminals used to accept payments by card or by phone. In online stores, payment gateways are the “checkout” portals used to enter credit card information or credentials for services such as Google Pay, Amazon Pay, Facebook Pay and WhatsApp Pay. Using multiple gateways make great business sense when you considering the flexibility it gives to your team. There are various kinds of E-payment present in a market, some are mentioned below:

- Automated clearing house.
- Wire transfers.
- Item processing.
- Remote deposit capture.
- FedLine Access Solutions.
- Automated Teller Machines.
- Card Services (ATM, credit, debit, prepaid)
- Mobile payments
- Crypto currency

On the other hand E-payment methods could be further classified into two areas, credit payment systems and cash payment systems which we usually called Pre Paid & Post Paid E-Payment System.

Prepaid refers to the scheme in which you buy credit in advance before availing services. Postpaid is defined as a scheme in which the customers are billed at the end of the month for the services availed by them. Examples include plastic card, on-line transactions, concerned bank, performed by phones or by filling form on the website, Cyber Cash, encrypted payment, Internet Cheques, cheques for deposit, Process them internally, and clear and settle between banks, cheques handwriting signatures.

5.8.1 Credit Cards

Credit card is a plastic card which is issued by a bank. It is issued to customers of high credit ranking, the necessary information is stored in magnetic form on the card. A card holder can purchase the item from the shop or the showrooms and need not pay cash. He has to flash the card in machine at the place where he is making purchases. Banks issue credit card to the customers up to a certain limit. The customers can purchase goods/services from the authorized showrooms without carrying physical cash with them. The bills are presented by the showroom to the authorized branch. This bill is presented by the paying branch to the issuing branch.

Issuing branch informs the customer about the debit. Banks take nominal charges for credit cards.

5.8.2 Cyber Cash

Unlike Credit card, Cyber Cash is not directly involved in handling funds. In Cyber cash system, after deciding what is to be purchased the customer makes payment to the merchant through credit card without disclosing the credit card number to him. The credit card number is sent to the merchant in encrypted form. The merchant forward the encrypted payment with his private key to the bank's Cyber Cash gateway server. The bank's Cyber Cash gateway server decrypts the information, processes the transaction and forward it to the merchant's bank.

It is basically a form of the e-payment system which requires the use of the card issued by a financial institute to the cardholder for making payments online or through an electronic device, without the use of cash.

5.8.3 Internet Cheques

A cheque is a signed paper document that orders the signer's bank to pay an amount of money to a person specified on the cheque or bearer from the signer's account on or after a specified date. Cheques pass directly from the payer to the payee, so that the timing or the purpose of the payment is clear to the payee. The payee can deposit the cheque in an account of his choice or cash it. Banks operate extensive facilities to accept cheques for deposit Process them internally and clear and settle between banks.

5.8.4 Smart card

It is a plastic card with a microprocessor that can be loaded with funds to make transactions; also known as a chip card.

5.8.5 Cash Payment System

- A. **Direct debit** — A financial transaction in which the account holder instructs the bank to collect a specific amount of money from his account electronically to pay for goods or services.
- B. **E-check** — It is a digital version of an old paper check. It's an electronic transfer of money from a bank account, usually checking account, without the use of the paper check.
- C. **E-cash** – It is a form of an electronic payment system, where a certain amount of money is stored on a client's device and made accessible for online transactions.
- D. **Stored-value card** — A card with a certain amount of money that can be used to perform the transaction in the issuer store. A typical example of stored-value cards are gift cards.

5.8.6 E-wallet


It is clear that mobile wallets are slowly making a mark as a form of payment method, but cash still remains to be an imperative necessity for consumers

life. Experts from different sectors including network operations, banks, express that, mobile payments will quickly replace traditional wallets over time. Recent studies show that consumers' awareness has increased mobile payment usage. E-Wallets a form of prepaid account that stores user's financial data, like debit and credit card information to make an online transaction easier. There are various kinds of wallets.


The Reserve Bank of India has three categories for wallets—closed, semi-closed and open. A closed wallet can be used to buy goods and services exclusively from one company. Semi-closed wallets, on the other hand, can be used to buy goods and services, including financial services, at specified merchant locations, which have a specific contract with the issuer to accept the payment instruments. Open wallets can, however, be used for purchase of goods and services, including at merchant locations or point of sale terminals that accept cards, and also for cash withdrawal at ATMs or from business correspondents. These wallets can only be issued by banks. Money can be added using Net banking, and credit or debit cards. Prepaid wallets have transaction limits and validity periods.




There are various kinds of wallet it could be either a prepaid or postpaid for an example. There is a semi-closed prepaid wallet which can be used to transfer money to other wallet users and bank accounts, anytime, anywhere. We are presenting a comparative view about these wallets omnipresent in a scenario.




Table:5.1:Comparative view about these wallets


Sl. No	Name of a Wallet	Founded & Launched	Characteristics	Modus Operandi	Appearances
1.	Google Pay	September 11, 2015; 5 years ago (as Android Pay) January 8, 2018 (as Google Pay)	Google Pay is a digital wallet platform and online payment system developed by Google. Google Pay is a safe, simple, and helpful way to manage your money, giving you a clearer picture of your spending and savings:	It has features of power in-app and tap-to-pay purchases on mobile devices, enabling users to make payments with Android phones, tablets or watches. Users in the United States and India can also use an iOS device, albeit with limited functionality. Google Pay is directly connected to your bank account and your registered phone number. This helps you save time that you would rather spend on reloading wallets and doing additional KYC which is generally required for other digital wallets in India.	

E-Payment System

Sl. No	Name of a Wallet	Founded & Launched	Characteristics	Modus Operandi	Appearances
2.	Amazon Pay	Launched in 2007	Amazon Pay is an online payments processing service that is owned by Amazon.	Amazon Pay uses the consumer base of Amazon.com and focuses on giving users the option to pay with their Amazon accounts on external merchant websites	
3.	WhatsApp Pay	Launched in February 2018 in India as part of a trial run	Designed in partnership with NPCI, WhatsApp Pay is an in-chat payment feature that allows users to make transactions via WhatsApp to their contact list.	WhatsApp Pay allows users to send money only to their contacts after which it enables UPI ID. WhatsApp Pay users can enter the UPI ID and send money. Through QR code, WhatsApp users can also send money to people who are not in their contact list.	
4.	BHIM	BHIM has been conceived and launched by the Hon'ble Prime Minister of India, Narendra Modi on 30th December 2016 to bring in Financial Inclusion to the nation and a digitally empowered society	This digital wallet is backed by the Reserve Bank of India (RBI) and launched by The National Payments Corporation of India. BHIM is probably one of the best digital wallets in India based on UPI	BHIM lets you send and receive money using Virtual Payment Address (VPA) wherein you can transact without disclosing your bank details. Consequently, it also allows merchants to transact with customers by using fingerprint scanner which is obtained through the Aadhaar database. BHIM enables QR code scan-and-pay option. Likewise, you can generate your own unique UPI PIN and QR code through the app. Also, you don't need to worry about security issues as your login expires after 90 seconds of inactivity to minimize inappropriate and fraudulent use of your data. Additionally, BHIM also provides you a transaction history to make sure that you keep a check on your transactions through the app	

Sl. No	Name of a Wallet	Founded & Launched	Characteristics	Modus Operandi	Appearances
5.	Facebook Pay	Facebook was initially incorporated as a Florida LLC. For the first few months after its launch in February 2014, the costs for the website operations for thefacebook.com were paid for by Mark Zuckerberg and Eduardo Saverin, who had taken equity stakes in the company.	Facebook has formally stepped into the digital payments space by launching Facebook Pay in the US. The platform will allow users to make payments across Facebook and Messenger and the company says Facebook Pay will also be expanded to Instagram and WhatsApp in the future. Facebook Pay is a seamless and secure way to make payments on Facebook,	Facebook Pay is available to make payments and purchases on apps, instead of having to re-enter your payment information each time. Facebook never holds the money, though the receiver's bank will usually take a few days to make the funds available as is standard. Get real-time customer support via live chat in the US (and in more places around the world in the future)	
6.	PayZapp	HDFC Bank launched PayZapp on June 10, 2015, to the customers	PayZapp a mobile payment app by HDFC Bank	The HDFC PayZapp e-wallet app is protected with a two-step encryption-based authentication process which helps the users to make payments instantly be it for booking movie tickets or for recharging their mobile numbers or paying utility bills or buy groceries or pay for hotel bills or pay for DTH or make payment for data card or transfer of money to others and so on. PayZapp conducts three security checks for each transaction by using proprietary technology	
7.	PayTM Wallet	Founded on August 2010	Paytm Wallet — a secure digital wallet that lets you manage your money with a touch; pay bills, make recharges, send money to friends & pay for purchases across various brands	Paytm follows PCI DSS compliant in terms of security. It never stores customer's CVV number to ensure their Credit and Debit Card details are completely safe.	

Sl. No	Name of a Wallet	Founded & Launched	Characteristics	Modus Operandi	Appearances
8.	PhonePe	PhonePe was founded in December 2015, by Sameer Nigam, Rahul Chari and Burzin Engineer. The PhonePe app, based on the Unified Payments Interface, went live in August 2016	The company was acquired by Flipkart in 2016 and it was rebranded as PhonePe wallet. Within 3 months of launch, the app was downloaded by over 10 million users. In 2018, PhonePe also became the fastest Indian payment app to get a 50 million badge on the Google play store	The PhonePe app is based on the Unified Payment Interface (UPI) platform. UPI payment system allows money transfer between any two bank accounts by using a smartphone.	 PhonePe
9.	Jio Money	Started its operations during 2018, is headquartered in Navi Mumbai, India. JioMoney was started as a joint venture between the Reliance Industries and State Bank of India, with a stake ratio of 70:30.	JioMoney is a safe and secure way to make digital payments across physical and online channels. Securely store all your credit/debit cards and bank accounts for convenient and faster payments. Make in-store and online payments across a variety of merchants. Transfer funds to other JioMoney users and to bank accounts.	The payments bank is a special category of banks which can accept deposits and can make payments but are not entitled to issue a loan or other form of credits including the credit cards. The unique feature of JioMoney lies in the fact that payments at the Reliance Outlets be it Reliance Fresh, Reliance Trends, Reliance Jewels and others can be done using this wallet. The app also allows its users to transfer the JioMoney balance to the respective bank account.	 JioMoney
10.	Alipay	Established in Hangzhou, China in February 2004 by Alibaba Group and its founder Jack Ma. In 2015.	Alipay is a third-party mobile and online payment platform.	Alipay Wallet, which also includes a mobile app that allows customers to conduct transactions directly from their mobile devices. Alipay is a must-have payment method for any business looking to reach a critical mass of Chinese shoppers both home and abroad.	 Alipay

Sl. No	Name of a Wallet	Founded & Launched	Characteristics	Modus Operandi	Appearances
11.	Apple pay	Initial release date: October 2014	Apple Pay is a mobile payment and digital wallet service by Apple Inc. that allows users to make payments in person, in iOS apps, and on the web using Safari. It is supported on the iPhone, Apple Watch, iPad, and Mac	Apple Pay is a contactless payment technology for Apple devices. It was designed to move consumers away from physical wallets into a world where your debit and credit cards are on your iPhone or Apple Watch, allowing you to pay using your device instead of a card. Apple customers in the US can use Apple Pay to send and receive money with friends and family quickly, easily and securely. Apple Watch users can now simply ask Siri to pay someone. Apple Pay is now the simplest and most convenient way to make person to person payments on iPhone, iPad and Apple Watch	
<p>Source: BCOS-184: E-commerce (B.Com) SOMS, IGNOU © 2021. All logo vested with a respective company and will be used for academic learning only</p>					

5.8.7 Crypto Currencies

Crypto currencies are rapidly gaining interest as a payment method for online transactions, particularly among young, moneyed professionals with IT expertise.

5.9 REQUIREMENT METRICS OF A PAYMENT SYSTEM

1. **Security:** Security is a massive cause of concern when payments become digital in nature. Right from the need to being able to assure that personal information would not compromise and that their money is in safe hands.
2. **User Experience:** Companies are taking user experience seriously, and quite a few of them are innovatively redesigning crucial interfaces. Although when a product or application is first launched, the emphasis may be on the reception of the overall idea, over time, it has been tested and proved that applications with a great user experience can launch the business to a whole new platform.

- 3. **Functionality:** Functional testing comprises of functionality testing, which is a feature validation of an entire function or component of the product. Software testing organizations are providing end-to-end test coverage, ranging right from the requirements-gathering stage, in order to ensure that the defect rates are reduced.
- 4. **Performance:** Performance testing is undoubtedly crucial. Right from monitoring the response time of the application, to ensuring that the load and stress testing are done, performance testing is necessary to gauge that overall, the app will respond like it has been intended to. It is important to be able to appropriately determine the finest approach and best methodology for performance testing and its subsequent validation.
- 5. **Data Integrity:** Compromising such data can have disastrous consequence, and banking organizations must take care to never be at the receiving end of such a disaster.

Check Your Progress B

- 1. Fill in the blanks with appropriate words:
 - i) payment gateways direct the customer away from the site’s checkout page.
 - ii) gateways redirect the customer to the payment gateway’s website (the bank’s website) where they enter their payment details and contact details.
 - iii) refers to the scheme in which you buy credit in advance before availing services.
 - iv) Banks takes nominal charges for
 - v) Reserve Bank of India has classified E-wallets into categories.
- 2. State whether the following are true or false.
 - i) Ecommerce payment gateways are used to handle payment transaction services through a secured gateway to make a payment for the customer orders.
 - ii) PayPal is an example of API hosted payment gateways.
 - iii) The payment gateway you choose should be independent on your business model.
 - iv) Using multiple gateways makes great business sense when you consider the flexibility it gives your team.
 - v) A typical example of stored-value cards are gift cards.
- 3. What are the benefits of API hosted payment gateways?

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4. What do you mean by cyber cash?

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5.10 MERITS OF E-PAYMENT SYSTEM

E-payment systems are made to facilitate the acceptance of electronic payments for online transactions. With the growing popularity of online shopping, e-payment systems became a must for online consumers — to make shopping and banking more convenient. It comes with many benefits, such as:

- Reaching **more clients** from all over the world, this result in more sales.
- More **effective and efficient transactions** — It's because transactions are made in seconds (with one-click), without wasting customer's time. It comes with speed and simplicity.
- **Convenience.** Customers can pay for items on an e-commerce website at anytime and anywhere. They just need an internet connected device. As simple as that!
- **Lower transaction cost** and decreased technology costs.
- **Expenses control for customers**, as they can always check their virtual account where they can find the transaction history.
- Today it's **easy to add payments to a website**, so even a non-technical person may implement it in minutes and start processing online payments.
- Payment gateways and payment providers offer highly **effective security and anti-fraud tools** to make transactions reliable.

5.11 RISKS INVOLVED IN E-PAYMENT

E-commerce **fraud** is growing at a pace of 30% per year. If a merchant follow the security rules, there shouldn't be such problems, but when a merchant chooses a payment system which is not highly secure, there is a risk of sensitive data breach which may cause identity theft.

The lack of anonymity — for most, it's not a problem at all, but you need to remember that some of your personal data is stored in the database of the payment system.

The need for internet access — as you may guess, if the internet connection fails, it's impossible to complete a transaction, get to your online account, etc.

E-commerce, as well as m-commerce, is getting bigger year after year, so having an e-payment system in your online store is a must. It's simple, fast and convenient, so why not have one?

Still, one of the most popular payment methods are credit and debit card payments, but people also choose some alternatives or local payment methods. If you run an online business, find out what your target audience needs and provide the most convenient and relevant e-payment system.

5.12 LET US SUM-UP

The term electronic payment refers to a payment made from one bank account to another using electronic methods and forgoing the direct intervention of bank employees. Barely defined electronic payment refers to e-commerce a payment for buying and selling goods or services offered through the Internet, or broadly to any nature of electronic funds transfer.

The basic characteristics of e-payment system are applicability, ease of use, security, reliability, trust, scalability, convertibility, interoperability, efficiency, anonymity, traceability, and authorization type.

Payment gateway is essentially a bridge or connection pathway between your customers and the relevant financial institution. Gateways are a link between the merchant's website and a payment provider or banking network. Essentially, they act as a "wire" that connects your site to a payment provider and allows secure payment data to flow back and forth. It plays the role of a third party that securely transfers your money from the bank account to the merchant's payment portal.

Once a credit card's testimonials has penetrated into the payment section of an e-Commerce website, the payment gateway encrypts the perceptive details of the card to check both the consumer and the merchant from fraudulent activity as the information is passed between the two during their transaction. The payment gateway then routes that information to the merchant's issuing bank for authorization, and then consequently notifies the merchant of the transaction's status (authorized or declined). Last but not least, the payment gateway settles funds with the merchant after the issuing bank settles the funds with the gateway.

There are four simple steps in the payment gateway process namely; collection, authentication, authorization and settlement.

There are various types of payment gateways such as Hosted payment gateways, Self-Hosted Payment Gateways, API hosted payment gateways and Local bank integration gateways.

There are various types of payment gateways consumers are using. It can be possible in brick-and-mortar which we usually called a physical stores and shopping online which we called click-and-mortar stores. In physical stores,

payment gateways consist of the point of sale (POS) terminals used to accept payments by card or by phone. In online stores, payment gateways are the “checkout” portals used to enter credit card information or credentials for services such as Google Pay, Amazon Pay, Facebook Pay and WhatsApp Pay.

There are various methods of E-payments. Examples of payment methods include plastic card, on-line transactions, concerned bank, performed by phones or by filling form on the website, Cyber Cash, encrypted payment, Internet Cheques, cheques for deposit, Process them internally, and clear and settle between banks, cheques hand writing signatures.

5.13 KEYWORDS

Electronic Payment: It refers to a payment made from one bank account to another using electronic methods and forgoing the direct intervention of bank employees.

Payment Gateway: It is an online application (characteristically used in e-Commerce) that conducts payment authorizations for merchants, electronically based businesses (e-businesses), merchants with mutually brick and mortar locations and online locations and merchants with long-established brick and mortar stores.

Prepaid e-payment system: It refers to the scheme in which you buy credit in advance before availing services.

Postpaid e-payment system: It is defined as a scheme in which the customers are billed at the end of the month for the services availed by them.

Hosted payment gateway: It directs the customer away from the site’s checkout page. When the customer clicks the gateway link, they are redirected to the Payment Service Provider (PSP) page.

Cyber Cash: In Cyber cash system, after deciding what is to be purchased the customer makes payment to the merchant through credit card without disclosing the credit card number to him.

Smart card: It is a plastic card with a microprocessor that can be loaded with funds to make transactions; also known as a chip card.

Credit card: It is plastic card which is issued by a bank. It is issued to customers of high credit ranking the necessary information is stored in magnetic form on the card.

5.14 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress A.

- (i) Automated Clearing House (ii) Traditional payment; E-payment (iii) digital circulation (iv) point of sale (v) acquirer
- (i) True (ii) False (iii) True (iv) True (v) False

Check Your Progress B

1. (i) Hosted (ii) Local bank integration (iii) Prepaid payment system
(iv) credit cards (v) three
2. (i) True (ii) False (iii) False (iv) True (v) True

5.15 TERMINAL QUESTIONS

1. Define Electronic Payment System
2. State the difference between traditional payment and e- payment.
3. What are the key players in payment gateways?
4. Explain the steps in payment gateway process.
5. What are the merits of E-payment system?
6. What are Requirements Metrics of a Payment System?
7. State the three categories of E-Wallets.
8. Explain the different types of E-payment system.



Note

These questions are helpful to understand this unit. Do efforts for writing the answer of these questions but do not send your answer to university. It is only for your practice.

UNIT 6 E-BANKING

Structure

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Concept of E-Banking
- 6.3 Importance of E-Banking
- 6.4 Technology used in Banking
- 6.5 EFT (Electronic Fund Transfer)
 - 6.5.1 NEFT (National Electronic Fund Transfer)
 - 6.5.2 RTGS (Real Time Gross Settlement)
 - 6.5.3 IMPS (Immediate Payment Service)
 - 6.5.4 UPI (Unified Payments Interface)
 - 6.5.5 Difference between NEFT, RTGS & IMPS
- 6.6 Virtual Currency
- 6.7 Automated Clearing House
- 6.8 Automated Ledger Posting
- 6.9 Distributed Ledger Technology
- 6.10 Let Us Sum Up
- 6.11 Key Words
- 6.12 Terminal Questions

6.0 OBJECTIVES

After studying this unit, you should be able to:

- to explain the meaning of E-Banking;
- to distinguish between the commonly used tools for Electronic Fund Transfer;
- to discuss the need for technology in banking; and
- to understand and appreciate the various technology led developments in the Banking Industry.

6.1 INTRODUCTION

Electronic banking is a form of banking in which funds are transferred through an exchange of electronic signals rather than through an exchange of cash, checks, or other types of paper documents. It is also known as electronic funds transfer (EFT) and basically uses electronic means to transfer funds directly from one account to another. Internet banking is a financial institution with no physical branches; everything is completed online. There is no ability to cash a check, deposit cash and or coinage and such. Online banking is the ability to access account information,

make transfers, set up automatic payments and such via the Internet. Internet banking typically is an electronic payment system, that allows the bank account holder to execute the monetary transaction, such as bill payments, fund transfer, stop payment, balance enquiries, etc. anytime and anywhere using the bank's website. Online banking is part and parcel of the core banking system handled by the bank.

6.2 CONCEPT OF E-BANKING

Privatization and globalization of banks led to huge competition among established and the new banks. The banks increased the number of services offered to include insurance, pension funds, mutual funds, money market accounts, loans and credit plus securities. They were encouraged to explore other financial instruments while at the same time offering more convenience to customers to do any-time banking. The culmination of financial innovations in banking over the past decade triggered a major shift away from the traditional banking model to a new digital banking one.

For consumers, one of the biggest drivers of satisfaction has always been the ease to do business. One of the key reasons for customers switching banks has always been "Not happy with the services". This need led to the origin of the concept of E banking which primarily means banking anytime, anywhere. Digitization has ushered a new era for financial services. It has contributed to the banks entering a period of unprecedented disruptions, in part because financial services innovations have contributed to a completely new way in which customers can bank through the increased mass adoption of mobile technology to the digitization of cash. The concept of E banking has redefined a banking model that had been unchanged for decades resulting in established banks being forced to increase their pace of digital adoption as well as drastically reduce their overheads through cost cutting measures like cutting the number of bank branches in which they operate. In order to stay competitive in today's marketplace, banks and other financial institutions have expanded the range of services that they offer. These services can be divided into four main categories:

- Savings
- Payment services
- Borrowing
- Other financial services

6.3 IMPORTANCE OF E-BANKING

E-banking is a service provided by banks that enables a customer to conduct banking transactions, such as checking accounts, applying for loans or paying bills over the internet using a personal computer, mobile telephone or handheld computer. It includes a range of services like Electronic Funds Transfer (EFT), Automated Teller Machine (ATM), Electronic Data Interchange (EDI), Credit Cards and Electronic or Digital Cash. E-banking has certain advantages over the traditional banking system, as stated below:

- It provides 24 hours, 365 days a year services to the customers of the bank.
- It lowers the transaction cost.
- It inculcates a sense of financial discipline and promotes transparency.
- Customers can make the transactions from office, home or while travelling via cellular phones.

E-Banking through electronic systems continues to expand. While most traditional financial institutions offer online banking services, Web-only banks have also become strong competitors. For example, E*Trade Bank operates online while also providing customers with access to ATMs. These “e-banks” and “e-branches” provide nearly every needed financial service like: Obtain cash, check account balance, Transfer funds, Direct Deposits, Preauthorized payments of bills, cards, rents etc. Unquestionably, many more of these types of financial innovations will be created over the coming years to try to win customers by switching their accounts. However, the extent of how far this innovation can be developed is still not known precisely and for digital banking firms to continue their rapid growth will ultimately be bound to the reliability of new technology advancements and their performance will be directly affected either positively or negatively by this.

6.4 TECHNOLOGY USED IN BANKING

Yesterday technology is no more a technology vis-a-vis the banking industry but has become a basic prerequisite as an obligatory function to run a bank. For many years retail banks have been secure, highly profitable businesses. However, recent industry disruption has been knocking at the industry much more than before. The turning point was the global financial crisis experienced between 2007 and 2009 which not only led to large losses but also shook the trust of the financial customers worldwide. These factors combined with the fact that banking has been relatively undisturbed for centuries, meant it was time for change, and the change has been the rapid use of technology in all spheres of banking. Over the past decade financial service innovations have contributed to a completely new way in which customers can bank, threatening the status quo of traditional retail banks, and redefining a banking model which has been in place for generations. These new technological advancements have facilitated the rapid emergence of digital banking firms and FinTech companies like Paytm, PhonePe, MobiKwik, PayU, ETMoney, PolicyBazaar leading to established banks being forced to swiftly increase their pace of digital adoption to stay relevant and stop mass client attrition to these agile financial start-ups.

With cash being overtaken by card payments for the first time and enhancement in technology now at the forefront, digital banking is gaining importance among financial customers to properly manage their finances. This may seem counterintuitive but technology has in fact allowed us to have a closer relationship with our bank than ever before and has become an evolving area. Mobile banking, check imaging and smartwatches are some of the latest technology related financial innovations assisting customers with a

variety of ways in which to spend, move and manage their money. Almost all banks have introduced Core Banking Solutions for their day-to-day operations. As such, banks are using the technology for Back end operations such as Analytics, Data storage and retrieval, Customer Relationship management (CRM), advances processing, report generation and decision making process.

Banking online and through electronic systems continues to expand. While most traditional financial institutions offer online banking services, Web-only banks have also become strong competitors.

6.5 EFT (ELECTRONIC FUND TRANSFER)

Electronic funds transfer (EFT) is an electronic method for transferring funds from one account to another either within a financial institution or across multiple institutions, by using computer-based systems, without the direct intervention of bank staff. Examples of EFT include receiving cash out of an ATM and then placing a stock buy order by using the telephone. Electronic payments are becoming more popular these days as they allow users to transfer funds by various online modes and eliminate any sort of geographical barriers. The ease of transferring money online helps in making most out of online banking services. For transferring money, banks provide multiple options based on various factors and needs of the customers, few of them are National Electronic Funds Transfer (NEFT), Real Time Gross Settlement (RTGS), Immediate Payment Service (IMPS), etc. Based on the value or speed of the transfer, service availability, and other factors, each mode of transfer has different kinds of features and flexibility as well as their own advantages and disadvantages. Moreover, many banks have their own digital wallets to facilitate additional methods of fund transfers online.

Out of various modes for online fund transfer digital wallets, UPI, etc. NEFT, RTGS, and IMPS are typically the most popular. In order to initiate a fund transfer, the originator or remitter (individual transferring the money), is required to have the basic account details of the beneficiary (to whom the money is being transferred) such as the account number, name on the account, IFSC, and the branch name etc. It is the originator who is considered responsible for ensuring the correctness of the account details used for a transfer of funds. Before understanding the various types of fund transfer methods, it is essential to learn the basic factors that are involved in each of the payment systems as explained below. These important factors distinguish the online fund transfer methods on various parameters:

1. **Fund Value:** The fund value is essential in determining which of the transfer methods are available for you. Depending on the value of the fund, the originator can choose a particular method. Moreover, for a newly registered beneficiary, a limited amount of funds is allowed to be transferred.
2. **Timings (service availability):** There are certain methods of fund transfer that allows 24/7 online transfers while other have specified timings. The latter will allow a remitter to initiate a fund transfer any

time of the day but the funds will settle only during the availability of the service. There are certain types of fund transfer methods that are not available during the weekend and public holidays while others operate round the clock throughout the year.

3. **Fund Settlement Speed:** After considering the fund value, most often an individual will look into the settlement speed factor. Each of the fund transfer methods come with different speed of fund settlement. Fund settlement speed indicates the amount of time consumed and the speed at which the funds are settled to the beneficiary's account once it's been initiated. In most cases, people largely choose one transfer method over other due to the speed factor, however, a faster settlement speed is bound to attract additional charges.
4. **Charges:** In accordance with the Reserve Bank of India (RBI), banks decide the transaction charges for each of the fund transfer methods. The charges are based on the total value of the fund, settlement speed, and other features/flexibility offered by the bank. Moreover, the government levies an applicable service charge for each fund transfer transaction. Particular bank's website can be referred to obtain the latest list of transaction fees and other charges.
5. **Transaction Limits:** All banking and financial institutions specify transaction limits on most types of banking and financial products. RBI regulates the transaction limits and all other factors of fund transfer through the Board for Regulation and Supervision of Payment and Settlement Systems (BPSS). BPSS is a subcommittee of the Central Board of the RBI and designated for being the highest authority for making policies pertaining to the payment systems in India. Moreover, BPSS is also responsible for supervising all the payment and settlement systems. All the payment and settlement systems in India are regulated under the Payment and Settlement Systems Act, 2007 (PSS Act).

6.5.1 NEFT (National Electronic Fund Transfer)

National Electronic Funds Transfer or NEFT is the most commonly used online payment option to transfer money from one bank account to another. Usually, salary transfers by companies are done using NEFT. The funds are transferred on a deferred settlement basis, which implies that the money is transferred in batches. There is no maximum limit but this depends from one bank to another. For instance, the retail banking limit set by SBI is Rs. 10 lakhs. Based on the amount being transferred the bank can charge an amount from Rs 2.50 to Rs 25. The money can be transferred only during the bank working days. The transactions cannot be completed over the weekends and on bank holidays. It will be completed on the next working day. Thus, instant transactions can't be made using NEFT. Various requirements for conducting an NEFT transfer are:

- Recipient's name
- Recipient's bank name
- Recipients' account number

- IFSC code of the beneficiary bank

6.5.2 RTGS (Real Time Gross Settlement)

Money can be transferred from one bank to another on a real-time basis using Real Time Gross Settlement or RTGS method. There is no maximum transfer limit, but the minimum is Rs. 2 lakhs. The transactions are processed throughout the RTGS business hours. Usually, the amount is remitted within 30-minutes. To be able to transfer money through RTGS, it is required for the sender and the receiver bank branch to be RTGS enabled. It costs a little more than NEFT. But still, it will not cost you more than Rs. 30 for transactions up to Rs. 5 lakhs. The fee varies from one bank to another. Various requirements for conducting a RTGS are:

- Amount to be sent
- Account number of the remitter or sender
- Name of the recipient or beneficiary
- Account number of the beneficiary
- Beneficiary's bank and branch name
- IFSC code of the receiving branch
- Sender to receiver information, if any

6.5.3 IMPS (Immediate Payment Service)

An IMPS sends instant payments. The money is transferred instantaneously through mobile phones using this interbank electronic fund transfer service. You can make the transactions 24x7x365 across banks including all weekends and bank holidays. The money can be transferred using phones, ATMs, Mobile Money Identifier (MMID) and internet banking. The idea is simple to allow users to make payments with the mobile number of the beneficiary. Various requirements for conducting IMPS are:

- MMID of the Recipient
- 7 Digit MMID Number
- MMID of the receiver
- Name of the beneficiary
- Beneficiary's mobile number
- Account Number of the recipient
- IFSC Codes of the beneficiary bank

6.5.4 UPI

Unified Payments Interface is an instant real-time payment system developed by National Payments Corporation of India facilitating inter-bank transactions. The interface is regulated by the Reserve Bank of India and works by instantly transferring funds between two bank accounts on a mobile platform.



Source: UPI

Fig 6.1: UPI

Unified Payments Interface is a real time payment system that allows sending or requesting money from one bank account to another. Any UPI client app may be used and multiple bank accounts may be linked to single app. Money can be sent or requested with the following methods:

- Virtual Payment Address (VPA) or UPI ID: Send or request money from/to bank account mapped using VPA.
- Mobile number: Send or request money from/to the bank account mapped using mobile number.
- Account number & IFSC: Send money to the bank account.
- Aadhar: Send money to the bank account mapped using Aadhar number.
- QR code: Send money by QR code which has enclosed VPA, Account number and IFSC or Mobile number.



Fig 6.2: Examples of UPI Apps

6.5.5 Difference between NEFT, RTGS & IMPS

Irrespective of which system is being used, NEFT, RTGS, or IMPS, they function as robust fund transfer methods which allow individuals and businesses to transfer money online from anytime and anywhere in the world. Online transfer methods are subject to availability based on the customer’s eligibility and level of access granted by the bank. Additionally, the limits on fund value, timings, settlement speed, and other factors are a part of the online fund transfer method. Currently, NEFT, RTGS, and IMPS are the most popular methods of fund transfer in India, few of the notable differences between these methods are listed below:

Table 6.1: Key Differences between NEFT, RTGS and IMPS

Basis	NEFT	IMPS	RTGS
Speed of settlement	Half hourly	Real-Time	Real-Time
Maximum transfer value	No Limit	INR 200,000	No Limit
Minimum transfer value	No Limit	No Limit	INR 200,000
Charges	No Charges	Charges decided as per the bank for each transaction	No Charges
Timing	24*7, 365 Days	24*7, 365 Days	7 am IST- 5 pm IST (On all working days for banks in India)

Currently, Indians have the access to choose multiple fund transfer methods. The access to latest technology and an increasing demand for online-based service has left no stone unturned. From banking and financial institutions to governing bodies, and private businesses, the immense utilization of latest technology has helped almost everyone to bridge the gap between their customers, partners, vendors, etc. Considering the ever-increasing number of online users in India and all around the world, it is certain and undeniable that people like to transact digitally and prefer to send money online. Online fund transfers are not only fast, efficient, and convenient, but also useful for accounting and documentation purposes. Unlike other methods, online transfers are superior in terms of reliability and the cost factor as well.

Check Your Progress A:

1. What are the advantages of E-banking?

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2. What is EFT?

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3. What are the various constraints of NEFT?

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4. What are the various requirements of IMPS?

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6.6 VIRTUAL CURRENCY

Virtual currency, or virtual money, is a type of unregulated digital currency, which is issued and usually controlled by its developers and used and accepted among the members of a specific virtual community. The term came into existence around 2012, when the European Central Bank (ECB) defined virtual currency to classify types of “digital money in an unregulated environment, issued and controlled by its developers and used as a payment method among members of a specific virtual community,” according to Bitcoin News. Virtual currency can be defined as “an electronic representation of monetary value that may be issued, managed, and controlled by private issuers, developers, or the founding organization”. Such virtual currencies are often represented in terms of tokens and may remain unregulated without a legal tender. The virtual currency is akin to a coupon.

Examples of virtual currencies are frequent flyer programs by various airlines, Microsoft Points, Nintendo Points, Facebook Credits and Amazon Coin etc. RBI has imposed a ban on the sale or purchase of crypto-currency by stating that financial institutions can no longer deal with entities that trade in virtual currencies such as Bitcoin. Along with use by the common public, a virtual currency can have restricted usage, and it may be in circulation only among the members of a specific online community or a virtual group of users who transact online on dedicated networks. Virtual currencies are mostly used for peer-to-peer payments and are finding increasing use for the

purchase of goods and services. The Reserve Bank of India had imposed a ban on crypto currency trading in April 2018 that barred banks and other financial institutions from facilitating “any service in relation to virtual currencies.” Various features of a virtual currency are explained as below:

- Virtual currency is a type of unregulated digital currency that is only available in electronic form.
- It is stored and transacted only through designated software, mobile or computer applications, or through dedicated digital wallets, and the transactions occur over the internet through secure, dedicated networks.
- Virtual currency is considered to be a subset of the digital currency group, which also includes cryptocurrencies, which exist within the Blockchain network.
- It is not controlled by a centralized banking authority.
- Virtual currency is different than digital currency since digital currency is simply currency issued by a bank in digital form.
- Virtual currency is unregulated without a legal tender and therefore experiences dramatic price movements since the only real force behind trading is consumer sentiment.
- Unlike regular money, virtual currency relies on a system of trust and may not be issued by a central bank or other banking regulatory authority. They derive their value based on the underlying mechanism, like mining in cases of cryptocurrencies, or the backing by the underlying asset.

Difference between Digital, Virtual, and Crypto Currencies

Digital currency is the overall superset that includes virtual currency, which in turn includes crypto currencies. Compared to virtual currency, a digital currency covers a larger group that represents monetary assets in digital form. Digital currency can be regulated or unregulated. In the former case, it can be denominated to a sovereign currency that is, a country’s central bank can issue a digital form of its fiat currency notes. On the other hand, a virtual currency often remains unregulated and hence constitutes a type of digital currency. Crypto currencies like bitcoin and ethereum are considered to be a part of the virtual currency group. A crypto currency uses cryptography technology that keeps the transactions secure and authentic, and also helps to manage and control the creation of new currency units. Such crypto currencies exist and are transacted over dedicated Blockchain-based networks that are open to the common public. Anyone can join and start transacting in crypto currencies.

6.7 AUTOMATED CLEARING HOUSE

Automated Clearing House (ACH) is a computer-based electronic network that coordinates electronic payments and automated money transfers i.e processes transactions, usually domestic low value payments, between participating financial institutions. ACH is a way to move money between banks without using paper checks, wire transfers, credit card networks, or

cash. ACH and EFT payments are similar in that they are both forms of electronic payments. However, EFT refers to all digital payments, whereas an ACH is a specific type of EFT. An ACH payment occurs when money moves from one bank to another bank. This money moves electronically, through the Automated Clearing House Network. In India National Automated Clearing House, or NACH, introduced by National Payments Corporation of India, is a centralized clearing service that aims at providing interbank high volume, low value transactions that are repetitive and periodic in nature. Most people already use ACH payments, although they might not be familiar with the technical jargon. When employers pay wages through direct deposit or consumers pay bills electronically out of checking accounts, the ACH network is often responsible for those payments. These computerized payments have benefits for both merchants and consumers as explained below:

1. **Lower costs:** ACH payments use fewer resources than traditional paper checks. There's no need for paper, ink, fuel to transport checks, time and labor to handle and deposit checks, and so on.
2. **Recordkeeping Convenience:** Electronic transactions make it easy to keep track of income and expenses. With every transaction, banks create an electronic record. Accounting and personal financial management tools can also access that transaction history.
3. **Convenience:** ACH is more convenient and easier to use as compared to the other methods of payment.
4. **Customer's preference:** ACH is preferred because of security, reduced human error and increase time savings, Faster processing time.

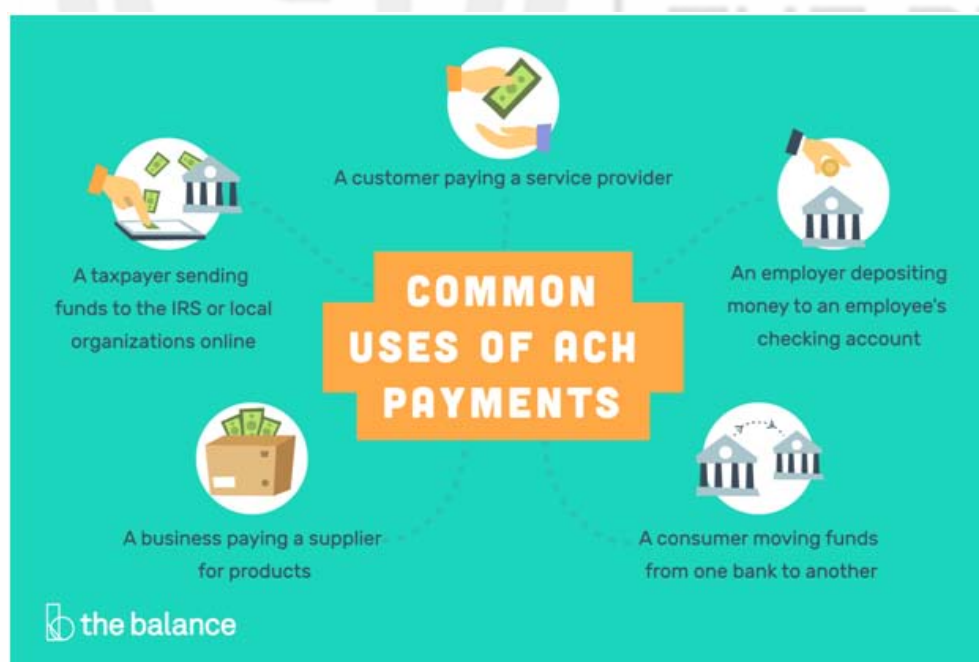


Fig 6.3: Common uses of ACH Payments

To complete payments, the organization requesting a payment (whether they want to send funds or receive funds) needs to get bank account information

from the other party involved. For example, an employer needs the following details from employees to set up direct deposit:

- The name of the bank or credit union receiving funds
- The type of account at that bank (checking or savings)
- The bank's ABA routing number
- The recipient's account number

With that information, payments can be created and routed to the correct account. Billers need those same details to make pre-authorized withdrawals from customer accounts. An originator starts a direct deposit or direct payment transaction using the ACH Network. Originators can be individuals, organizations, or government bodies, and ACH transactions can be either debit or credit. The originator's bank, also known as the originating depository financial institution (ODFI), takes the ACH transaction and batches it together with other ACH transactions to be sent out at regular times throughout the day.

An ACH operator, either the Federal Reserve or a clearing house, receives the batch of ACH transactions from the ODFI with the originator's transaction included. The ACH operator sorts the batch and makes transactions available to the bank or financial institution of the intended recipient, also known as the receiving depository financial institution (RDFI). The recipient's bank account receives the transaction, thus reconciling both accounts and ending the process. ACH payments are often electronic from start to finish. But sometimes merchants convert paper checks to electronic payments, and the funds move through the ACH system. The ACH Network essentially acts as a financial hub and helps people and organizations move money from one bank account to another. ACH transactions consist of direct deposits and direct payments, including B2B transactions, government transactions, and consumer transactions.

6.8 AUTOMATED LEDGER POSTING

Learning to identify anomalies in large-scale accounting data is one of the ancient challenges in financial statement audits or forensic investigations. Nowadays, the majority of applied techniques refer to handcrafted rules derived from known scenarios.



Fig 6.4: Automated Ledger Posting

The financial accounting term posting to the ledger refers to the process of analyzing the credits and debits appearing in journal entries, and recording those transaction amounts in the proper accounts found in the company's general ledger. The process of transferring the entries from journal to respective ledger accounts has been automated coining the term automated ledger posting. The balancing of ledgers is carried out automatically to find out differences at the end of the year. There are certain ways by which the ledger posting is automatically governed.

Artificial intelligence can help accountants to be more productive and efficient. Robotic process automation (RPA) allows machines or AI workers to complete repetitive, time-consuming tasks in business processes such as document analysis and handling that are plentiful in accounting.

Algorithms and Volume of Data

Two factors impact how well an AI platform is designed for accounting are:

1. Algorithms and the sophistication of its technology
2. The amount of data used for testing the technology

For an AI platform to perform exceptionally well, it has to have processed tens of millions of transactions to have a high level of certainty and prediction rate. Very few platforms reach that level since they either need to have a lot of clients or access to massive datasets.

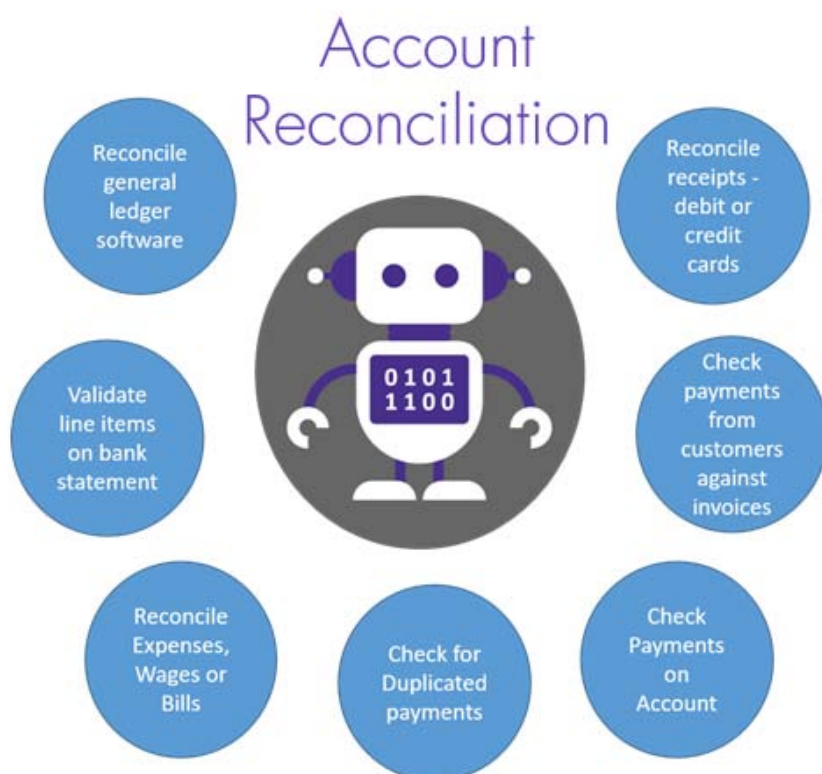


Fig 6.5: Account Reconciliation

AI can prevent these problems because well-trained AI knows everything needed to know a client (even tracing past trends, if applicable). AI can cut down on data retrieval fatigue and related human input errors by as much as 90%.

6.9 DISTRIBUTED LEDGER TECHNOLOGY

Since ancient times, ledgers have been at the heart of economic transactions, with the purpose of recording contracts, payments, buy-sell deals, or moving assets or property. The journey which began with recording on clay tablets or papyrus made a big leap with the invention of paper. Over the last couple of decades, computers have provided the process of record-keeping and ledger maintenance with great convenience and speed. Today, with innovation, the information stored on computers is moving towards much higher forms, which is cryptographically secure, fast, and decentralized. Companies can take advantage of this technology in many forms, one way being through distributed ledgers.

A distributed ledger can be described as a ledger of any transactions or contracts maintained in decentralized form across different locations and people, eliminating the need for a central authority to keep a check against manipulation. In this manner, a central authority is not needed to authorize or validate any transactions. All the information on the ledger is securely and accurately stored using cryptography and can be accessed using keys and cryptographic signatures. Once the information is stored, it becomes an immutable database, over which the rules of the network are applicable.

Thus a Distributed ledger technology (DLT) is a digital system for recording the transaction of assets in which the transactions details are recorded in multiple places at the same time. Unlike traditional databases, distributed ledgers have no central data store or administration functionality.

A distributed ledger is a database that is consensually shared and synchronized across multiple sites, institutions, or geographies, accessible by multiple people. It allows transactions to have public "witnesses". The participant at each node of the network can access the recordings shared across that network and can own an identical copy of it. Any changes or additions made to the ledger are reflected and copied to all participants in a matter of seconds or minutes. Underlying distributed ledgers is the same technology that is used by block chain, which is the technology that is used by bitcoin. Block chain is a type of distributed ledger used by bitcoin.

Advantages of Distributed Ledgers:

1. While centralized ledgers are prone to cyber-attack, distributed ledgers are inherently harder to attack because all of the distributed copies need to be attacked simultaneously for an attack to be successful. Furthermore, these records are resistant to malicious changes by a single party. By being difficult to manipulate and attack, distributed ledgers allow extensive transparency.
2. Distributed ledgers also reduce operational inefficiencies, speed up the amount of time a transaction takes to complete, are automated, and therefore function 24/7, all of which reduce overall costs for the entities that use them.

3. Distributed ledgers also provide an easy flow of information, which makes an audit trail easy to follow to accountants when they conduct reviews of financial statements. This helps remove the possibility of fraud occurring on the financial books of a company. The reduction in the use of paper is also a benefit to the environment.

Use of Distributed Ledgers:

1. Distributed ledger technology has great potential to revolutionize the way governments, institutions, and corporations work. It can help governments in tax collection, issuance of passports, recording land registries, licenses, and the outlay of Social Security benefits, as well as voting procedures.
2. While the distributed ledger technology has multiple advantages, it's in a nascent stage and is still being explored in how to adopt it in the best possible way. Though one thing is clear, that the future format of centuries-old ledgers is to be decentralized.

Check Your Progress B:

1. State the features of virtual currency.

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2. What are the benefits of ACH Payments?

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3. What is Automated Ledger Posting?

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4. State the advantages of Distributed Ledgers.

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6.10 LET US SUM UP

Electronic banking is a form of banking in which funds are transferred through an exchange of electronic signals rather than through an exchange of cash, checks, or other types of paper documents. It is also known as electronic funds transfer (EFT) and basically uses electronic means to transfer funds directly from one account to another. E-banking has certain advantages over the traditional banking system, as it provides 24 hours, 365 days a year services to the customers of the bank; lowers the transaction cost; inculcates a sense of financial discipline and promotes transparency; customers can make the transactions from office, home or while travelling via cellular phones.

For many years' retail banks have been secure, highly profitable businesses. However, recent industry disruption has been knocking at the industry much more than before. The turning point was the global financial crisis experienced between 2007 and 2009 which not only led to large losses but also shook the trust of the financial customers worldwide. These factors combined with the fact that banking has been relatively undisturbed for centuries, meant it was time for change, and the change has been the rapid use of technology in all spheres of banking.

Electronic funds transfer (EFT) is an electronic method for transferring funds from one account to another either within a financial institution or across multiple institutions. National Electronic Funds Transfer or NEFT is the most commonly used online payment option to transfer money from one bank account to another. Usually, salary transfers by companies are done using NEFT. The funds are transferred on a deferred settlement basis, which implies that the money is transferred in batches. Money can be transferred from one bank to another on a real-time basis using Real Time Gross Settlement or RTGS method. There is no maximum transfer limit, but the minimum is Rs. 2 lakhs. The transactions are processed throughout the RTGS business hours. IMPS send instant payments. The money is transferred instantaneously through mobile phones using this interbank electronic fund transfer service. You can make the transactions 24x7x365 across banks including all weekends and bank holidays.

Virtual currency, or virtual money, is a type of unregulated digital currency, which is issued and usually controlled by its developers and used and accepted among the members of a specific virtual community. The virtual currency is akin to a coupon. A virtual currency can have restricted usage, and it may be in circulation only among the members of a specific online community or a virtual group of users who transact online on dedicated networks. Automated Clearing House (ACH) is a computer-based electronic network that coordinates electronic payments and automated money transfers i.e. processes transactions, usually domestic low value payments, between participating financial institutions. ACH is a way to move money between banks without using paper checks, wire transfers, credit card networks, or cash. ACH and EFT payments are similar in that they are both forms of electronic payments.

The financial accounting term posting to the ledger refers to the process of analyzing the credits and debits appearing in journal entries, and recording those transaction amounts in the proper accounts found in the company's general ledger. Distributed ledger technology (DLT) is a digital system for recording the transaction of assets in which the transactions details are recorded in multiple places at the same time. Unlike traditional databases, distributed ledgers have no central data store or administration functionality.

6.11 KEY WORDS

Electronic Banking: E-banking is a form of banking in which funds are transferred through an exchange of electronic signals rather than through an exchange of cash, checks, or other types of paper documents.

IFSC (Indian Financial System Code): IFSC is a unique eleven-digit number which is a combination of alphabets and numerals given to a bank for a specific branch.

NEFT (National Electronic Funds Transfer): NEFT enables an individual electronically transfer funds from any bank branch to any individual having an account with any other bank branch in the country participating in the Scheme.

RTGS (Real Time Gross Settlement): RTGS is an electronic form of funds transfers where the transmission takes place on a real time basis. In India, transfer of funds with RTGS is done for high value transactions, the minimum amount being Rs. 2 lakh. The beneficiary account receives the funds transferred, on a real time basis.

IMPS (Immediate Payment Service): IMPS is an instant payment inter-bank electronic funds transfer system in India. IMPS offer an inter-bank electronic fund transfer service through mobile phones.

Virtual Currency: Virtual currency is termed as an electronic representation of monetary value that may be issued, managed, and controlled by private issuers, developers, or the founding organization.

Automated Clearing House: An automated clearing house is a computer-based electronic network to move money between banks without using paper checks, wire transfers, credit card networks, or cash.

Distributed Ledger Technology: Distributed ledger technology is a ledger of any transactions or contracts maintained in decentralized form across different locations and people, eliminating the need for a central authority to keep a check against manipulation.

6.12 TERMINAL QUESTION

- 1) What all reasons were responsible for the technological innovation in the banking industry?

E-Payment System

- 2) What will be the things that need to be consider before initiating an online fund transfer? What all tools will you use?
- 3) What is the difference between NEFT,RTGS and IMPS?
- 4) What is a virtual currency? Why do you think crypto currency was banned by RBI?
- 5) What are the features of a virtual currency?
- 6) What is the difference between ACH and EFT?
- 7) What are the benefits of ACH payments?
- 8) Do you think Distributed Ledger Technology is revolutionizing the world? If so how?



Note

These questions are helpful to understand this unit. Do efforts for writing the answer of these questions but do not send your answer to university. It is only for your practice.