Unit-5- E-Payment System

Online Payment cards (Credit Cards, Charge Cards, Debit Card, Smart Cards), Processing Cards in online, credit card payment procedure, e-micropayments, e-checking and its processing in online. Automated clearing hours (ACH) network, mobile payments (Digital wallet), mobile payment participants and issues, international payments, emerging EC payment systems and issues: Crypto currency, virtual currency. A case study of emerging trend in online payment system in Nepal. **[6 LH]**

Introduction of E-Payment:

E-payment is a subset of an e-commerce transaction to include electronic payment for buying and selling goods or services offered through the Internet. Generally, we think of electronic payments as referring to online transactions on the internet, there are many forms of electronic payments.

As technology is developing, the range of devices and processes to transact electronically continues to increase while the percentage of cash and check transactions continues to decrease.

An **e-commerce payment system** facilitates the acceptance of electronic payment for online transactions. The main objectives of EPS are to increase efficiency, improve security, and enhance customer convenience and ease of use.

Types of E-Payment:

- ☞ Payment Cards
- ☞ Electronic wallets
- ☞ Electronic Funds Transfer (EFT)
- ☞ Electronic Check (E- check)
- ☞ Electronic Cash Systems
- ☞ Micro Payment Systems

1. **Electronic Funds Transfer (EFT):** EFT involves electronic transfer of money by financial institutions. It is the electronic transfer of money from one bank account to another, either within a single financial institution or across multiple institutions, through computer-based systems and without the direct intervention of bank staff. One of the most widely used EFT programs is **Direct Deposit**, in which payroll is deposited straight into an employee's bank account.
   EFT is the groundwork of the cash-less and check-less culture were paper bills, checks, envelopes, stamps are eliminated. The advantages of EFT contain the following:

a. Simplified Accounting
b. Improved Efficiency
c. Reduced Administrative Costs
d. Improved Security

2. **Payment Cards :** A payment card is a device usually an embossed plastic card that allows its owner (the cardholder) to make an electronic payment. They contain stored financial values that can be transferred from the customer's computer to the businessman's computer. E.g. Credit cards, debit cards, charge cards, smart cards are payment cards.

A. Credit Cards: They are the most popular method used in EPSS and are used by charging against the customer credit. There are two types of credit cards on the market today:

a. Credit Cards Issued By Credit Card Companies (E.G., MasterCard, Visa Card) and Major Banks: Credit cards are issued based on the customer's income level, credit history, and total wealth. The customer uses these cards to buy goods and services or get cash from the participating financial institutions. The customer is supposed to pay his or her debts during the payment period; otherwise, interest will accumulate. Two limitations of credit cards are their unsuitability for very small or very large payments.

b. **Credit Cards Issued by Department Stores and Oil Companies:** Businesses extremely benefit from these company cards, and they are cheaper to operate. They are widely issued to and used by a broad range of customers. Businesses offer incentives to attract customers to open an account and get one of these cards.

B. **Debit Cards:** The difference between credit cards and debit cards is to pay with a debit card you need to know your personal identification number (PIN) and need a hardware device that can read the information that is stored in the magnetic stripe on the back.

Debit cards task like checks in that the charges will be taken from the customer's checking account. The benefit for the customer is the easiness of use and convenience. These cards also keep the customer under his or her budget because they do not allow the customer to go beyond his or her resources.

C. **Charge Cards:** Charge cards are similar to credit cards except they have no revolving credit line, so the balance must be paid off every month. A credit card is different from a charge card: a charge card requires the balance to be paid in full each month. In contrast, credit cards allow the consumers a continuing balance of debt, subject to interest being charged.

D. **Smart cards:**

They include stored financial value and other important personal and financial information used for online payments. A smart card is about the size of a credit card, made of plastic with an embedded microprocessor chip that holds important financial and personal information.

The money on the card is saved in an encrypted form and is protected by a password to ensure the security of the smart card solution. To pay via a smart card, it is necessary to introduce the card into a hardware terminal, which requires a special key from the issuing bank to start a money transfer in either direction.

Smart cards can be disposable or rechargeable. A popular example of a disposable smart card is the one issued by telephone companies. Smart-card technology can be used to hold information on health care, transportation, identification, retail, loyalty programs and banking, to name a few. Smart cards are broadly classified into two groups:

a. Contact: This type of smart card must be inserted into a special card reader to be read and updated.

b. Contact-less: This type of smart card can be read from a short distance using radiofrequency.

A smart card is a plastic payment System card that contains data in an embedded microchip. The embedded chip can be a microprocessor combined with a memory chip or just a memory chip with nonprogrammable logic. Information on a microprocessor card can be added, deleted, or otherwise manipulated; a memory-chip card is usually a "read- only" card, like a magnetic stripe card. The card's programs and data must be downloaded from, and activated by, some other device (such as an ATM).

3. **Electronic Money (E-Money/E-Cash):** This is standard money converted into an electronic format to pay for online purchases. Like regular cash, e-cash enables transactions between customers without the need for banks or other third parties. When used, e-cash is transferred directly and immediately to the participating merchants and vending machines.

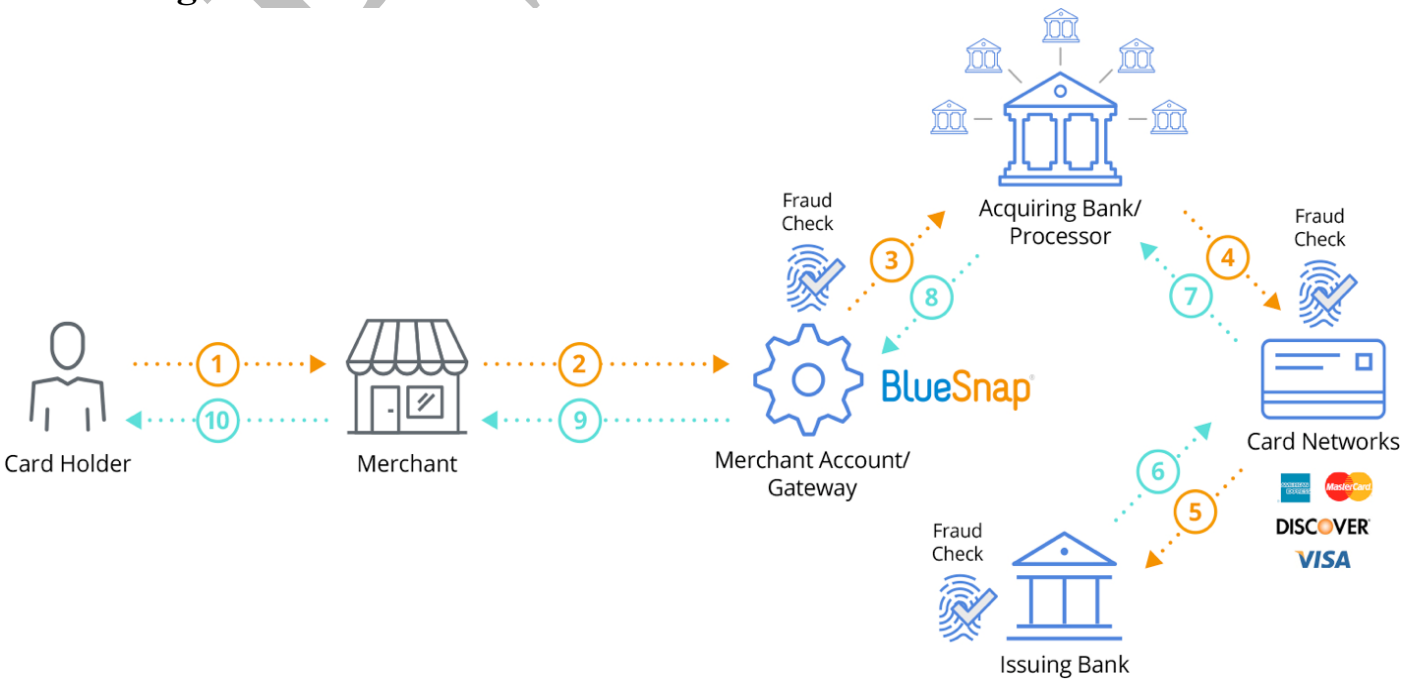
E-cash usually operates on a smart card, which includes an embedded microprocessor chip that stores cash value and the security features that make electronic transactions secure. Another form of electronic money is network money, software that allows the transfer of value on computer networks, particularly the internet.

E-cash is transferred directly from the customer's desktop to the merchant's site, so e- cash transactions usually require no remote authorization or personal identification number (PIN) codes at the point of sale. A customer or merchant signs up with one of the participating banks or financial institutions. The customer receives specific software to install on his or her computer. The software allows the customer to download "electronic coins" to his or her desktop. The software manages the electronic coins.

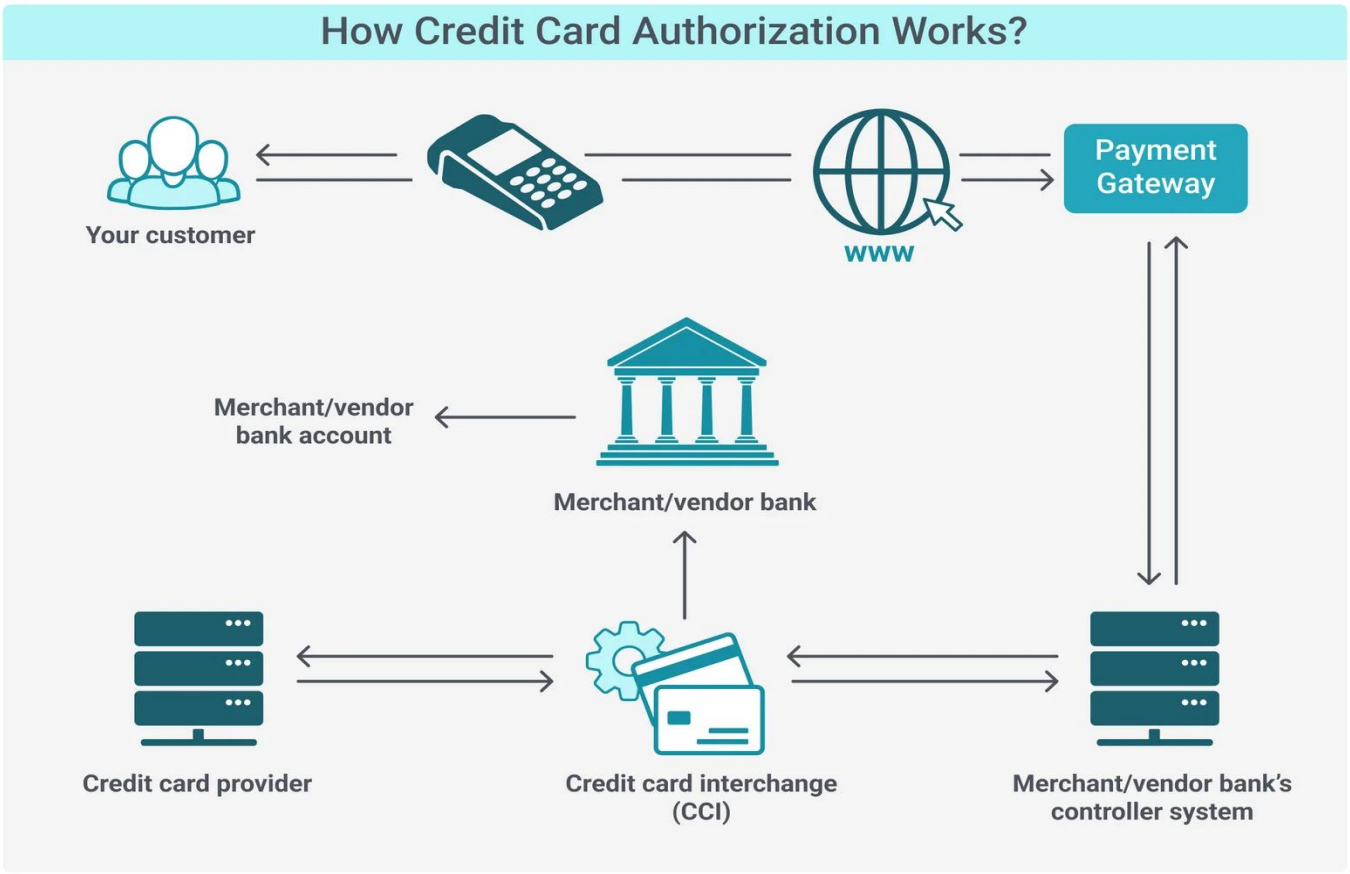
When the customer accepts the payment request after any purchase from the merchant, the software residing on the customer's desktop subtracts the payment amount from the balance and creates a payment that is sent to the bank or the financial institution of the merchant, and then is deposited to the merchant's account.

4. **Magnetic Ink Character Recognition (MICR): MICR code** is a character-recognition technology used mainly by the banking industry to ease the processing and clearance of cheques and other. In the MICR, data are printed at the bottom of cheques in magnetic ink that typically includes the document-type indicator, bank code, bank account number, cheque number, and a control indicator.
   The technology allows MICR readers to scan and read the information directly into a data- collection device. Unlike barcodes and similar technologies, MICR characters can be read easily by humans.
5. **Electronic Cheque:** E-cheque is the result of cooperation among several banks, government entities, technology companies, and e-commerce organizations. An e-cheque uses the same legal and business protocols associated with traditional paper checks, here, it replaces the handwritten signatures with digital signature. It is a new payment instrument that combines high-security, speed, convenience, and processing efficiencies for online transactions.
6. **Electronic Wallets (E-Wallets):** They are similar to smart cards as they include stored financial value for online payments. Electronic wallets (or Digital Wallets) being very useful for frequent online shoppers are commercially available for pocket, palm-sized, handheld, and desktop PCs.
   They offer a secure, convenient, and portable tool for online shopping. They can also store personal and financial information such as credit cards, passwords, PINS, e-checks, e-cash and much more.
   Consumers are not required to fill out order forms on each site when they purchase an item because the information has already been stored and is automatically updated and entered the order fields across merchant sites when using a digital wallet.
   Digital Wallets allow shoppers to link credit cards or other alternative payment methods to a virtual wallet. Their information is encrypted or protected by private software code.
   Example: eSewa, Khalti, IME-Pay, Nepal Pay etc.
7. **Micro-Payment Systems:** Merchants must pay a fee for each credit card transaction that they process; this can become costly when customers purchase inexpensive items. Micro-payments are used for small payments on the Web. The process is like e-wallet technology where the customer transfers some money into the wallet on his or her desktop and then pays for digital products by using this wallet.
   IBM offers micro-payment wallets and servers. IBM micro-payment systems allow vendors and merchants to sell content, information, and services over the Web. It provides universal acceptance and offers comprehensive security.
   It can be used for billing by banks and financial institutions, ISPs, content providers (offering games, entertainment, archives, etc.), telecommunications, service providers (offering fax, e-mail, or phone services over the Web), and by premium search engines and specialized databases.

Processing Cards Online



The processing of credit card payments has two major phases: **authorization** and **settlement**. There are several parties involved in both processes including
Authorization determines whether a buyer's card is valid (e.g. not expired) and whether the customer has sufficient credit or funds in his or her account.
Settlement involves the transfer of money from the buyer's account to the merchant's account.
Customer: The individual possessing the card.
The Merchant: The vendor that sells goods or services.
Issuing bank: The issuer (usually a bank) of the credit or debit card to customer (or businesses). Services include billing and collecting monthly payments.
Merchant acquiring Bank: Enrolls merchants into a program that accepts a specific card brand (e.g., Visa) and on the merchant's behalf, processes debit or credit card payments made using that particular card brand.
Credit card (association) network: Credit card networks determine where credit cards can be used and facilitate the payment process between credit card users, merchants, and credit card issuers.
Payment service provider: The company that provides electronic connections and transaction services among all the parties involved in electronic payments (including authorizations). A payment service provider is also called a payment gateway provider.



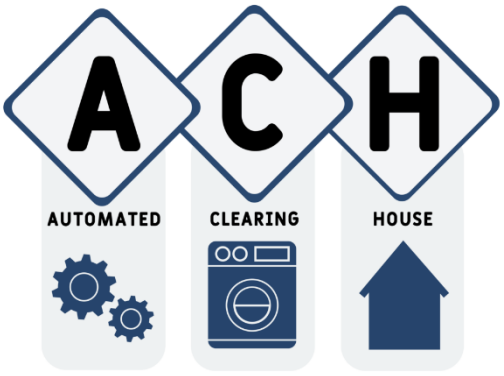
Authorization Cycle: The customer initiates a payment transaction (fills out web page, swipes a card, etc.). The merchant receives the transaction information. This information is passed to its PSP where it is routed to the merchant's acquiring bank (processor). The acquiring bank passes the information to the issuing bank through the credit card network. If the issuing bank approves the transaction, an authorization code is sent back to merchant via the same linkages. The issuing bank also holds an authorization associated with that merchant and consumer for the approved amount. Finally, the merchant notifies the customer and fulfills the order.
Settlement: At the end of the day, the merchant submits in batch all the approved authorizations they have received to the acquiring bank via its PSP. Again, the acquiring bank makes the batch settlement request to the issuing bank via the card network. The credit card issuer makes a settlement payment to the acquiring bank via the card network.

E-checks and its processing in online

An electronic version or representation of a paper cheque. The account holder writes an e-check (or e-cheque) using a computer or other type of electronic device and transmits checks to the payee electronically. Like paper cheques, e-checks are signed by the payer and endorsed by the payee. Rather than handwritten or machine-stamped signatures, however e-checks are affixed with digital signatures, using combination of smart cards and digital certificates.

The payee deposits the e-check, receives credit, and the payee's bank clears the e-check to the paying bank. The paying bank validates the e-check and then charges the cheque writer's account for the cheque. Additionally, it has more security features than standard paper checks including authentication, public key cryptography, digital signatures, and encryption, among others.

Automated clearinghouse (ACH)



In the United States, the ACH Network is the national automate clearing house for electronic funds transfers. It processes financial transactions for consumers, businesses, and federal, state, and local governments. ACH processes large volumes of credit and debit transactions in batches.

Nepal Clearing House Limited (NCHL), a subsidiary of the Central Bank of Nepal, has implemented an Electronic Check Clearing (ECC) system in Nepal. The introduction of ECC has drastically reduced the time required to clear the checks from a few days to minutes. Currently, 140 banks and financial institutions' 1200 branches across the country use our system. Checks are cleared at the branch level itself. Integrated Solutions partnered with Progress-Soft Corporation, Jordan, for the supply and implementation of ECC solution in Nepal.

Electronic Cheque Clearing (NCHL-ECC) is an image-based, cost-effective, MICR cheque processing and settlement solution where an original paper cheque is converted into an image for electronic processing of the financial transactions between participating member Banks/FIs. The physical movement of the cheques are truncated or stopped at the level of the presenting bank in the NCHL-ECC System. The cheque does not physically travel to the clearing house or to the paying branch as it used to do in the manual clearing process resulting in a faster and easier processing of the cheque transactions.

Mobile payments (Digital wallet)

Mobile wallets are a form of digital wallet most often used on mobile devices. One of the biggest advantages of digital wallets is that they let you pay for things without credit or debit cards, once you enter and store your card and banking information in the mobile payment platform.

usually, mobile payment refers to payment transactions initiated or confirmed using a person's mobile device, usually a smartphone although payments can be made with other mobile devices such as tablets and wearables. The term covers several different types of solutions, as well as different combinations of hardware and software technologies.

Mobile payment is a popular method for government's payments to people, especially in developing countries such as Nepal, India and Brazil, where more people have smartphones then bank accounts.

"Digital Wallet" also known as a "mobile wallet" or an "e-wallet" which is an online service or system that can store user's payment information. It can be used to make micro-electronic transactions. we can make such transactions via the internet, SMS, or a mobile app, after simple steps for registration. Example for international online payment platforms like Google Pay, Samsung Pay, Facebook Pay, etc. in context of Nepal eSewa, Khalti, IME Pay, PrabhuPay, QPay Nepal, Nepal Pay etc.

The term mobile **digital wallet** refers to the combination of an electronic account along with a smartphone and mobile app designed to make purchases digitally and to redeem rewards from loyalty programs and targeted digital promotions. There are two main types of wallets-device-based and cloud-based.

Device-Based Digital Wallets

These are proximity payment systems enabled by near-field communication (NFC) technology.

On the consumer side, the system requires that the mobile device being used is equipped with NFC antenna and an integrated chip or a smart card inside the phone that holds payment card information (credit or debit).

On the merchant's side, it requires a specialized NFC reader used to recognize the chip when the chip comes within a short distance of the reader and a network for handling the payment.

Essentially, a buyer first enters his or her credit card information into the wallet app on the phone prior to shopping. At the time of the purchase, the buyer then "waves" the specially equipped mobile phone near a reader to initiate a payment. The reader collects the info and passes it to the payment network. The card is charged, and the purchase is complete.

These proximity payments are also called contactless payments where the phone plays the surrogate roll of a contactless card with a chip.

The most popular are PayPal wallet (paypal.com), Apple Pay (apple.com/apple- pay), and Android Pay (android.com/pay).

Cloud-Based Digital Wallets

An alternative to device-based mobile wallets is cloud-based mobile wallets. The infrastructure for these wallets is not as onerous as a system based on NFC.

Basically, a customer enrolls his or her card with a secure Web service. Requests for payments are made to the service and charged to enrolled card(s).

In this way no card information is transmitted during a purchase. Instead, transactions are initiated by scanning a barcode or Quick Response (QR) code created specifically for the customer and stored and displayed on the smartphone by wallet app. A QR code is a 2D barcode consisting of a collection of black square dots placed on a square grid with a white background.

What is required on the merchant's end is a barcode or QR code image reader that is networked into the service via the Web. The whole system operates much like the way PayPal operates without using a Web page with a PayPal button to start the process. Instead, it starts when the code is scanned. As a point of fact PayPal employs a cloud-based mobile wallet instead of device-based.

International payment system

International payments consist of outgoing and incoming payments in a country's currency out of and into that country, as well as offshore payments in that currency, between two parties outside that country. A global payment and settlement system exists for each national currency. For payments between distant parties over such a system to function like the face-to-face delivery of cash, a robust banking system, tight risk controls, and sophisticated technological and liquidity-saving features must be put in place.

1. **Visa:** Visa Inc. is an American multinational financial services corporation headquartered in Foster City, California, United States. It facilitates electronic funds transfers throughout the world, most commonly through Visa-branded credit cards, debit cards and prepaid cards. Visa partners with companies across the world to facilitate transaction processing for both banks and merchants. Financial institutions and fintech companies can establish service agreements with Visa for branded cards that use the Visa network. Service agreements include bank transaction fees and Visa network charges. Visa also partners with merchants through varying types of service agreements.

   Visa is one of the major global payment systems, facilitating electronic funds transfers and transactions between consumers, merchants, and financial institutions. Here's a brief overview of how it works:

   a. **Card Issuance:** Visa cards are issued by banks and financial institutions. These cards can be credit, debit, or prepaid cards.
   b. **Transaction Initiation:** When you use a Visa card to make a purchase, you enter your card details at the point of sale, whether it's a physical store or an online retailer.
   c. **Authorization Request:** The transaction information is sent from the merchant's point-of-sale system to the acquiring bank (the merchant's bank), which forwards it to Visa's network.
   d. **Verification:** Visa's network routes the transaction request to the cardholder's issuing bank (the bank that issued the Visa card). The issuing bank checks the card details, ensures there are sufficient funds or credit, and assesses fraud risk.
   e. **Authorization Response:** The issuing bank sends an authorization response back to Visa's network, which forwards it to the acquiring bank, and then to the merchant's point-of-sale system. If the transaction is approved, it's completed; if not, it's declined.
   f. **Settlement:** After the transaction is authorized, the actual transfer of funds happens. The acquiring bank collects the payment from the issuing bank through Visa's network and deposits it into the merchant's account. The cardholder's account is debited or charged accordingly.
   g. **Billing:** The cardholder receives a statement or bill from their issuing bank detailing the transaction. They are responsible for repaying the amount spent if it's a credit card, or ensuring sufficient funds are available if it's a debit card.
   h. **Security Measures:** Visa incorporates various security measures, such as encryption, fraud detection systems, and tokenization, to protect cardholders and merchants from fraudulent activities.

   Visa also offers various services beyond just processing payments, including fraud protection, digital payment solutions, and global transaction support.

2. **MasterCard:** Mastercard Inc. is an American multinational payment card services corporation headquartered in Purchase, New York. It offers a range of payment transaction processing and other related-payment services. MasterCard is a global payments technology company that facilitates electronic transactions between consumers, merchants, and financial institutions. It provides various types of payment cards—credit, debit, and prepaid—issued by banks and other financial entities. MasterCard's network processes these transactions securely, ensuring that funds are transferred between

the cardholder's and the merchant's accounts. The company is known for its advanced security features, fraud prevention measures, and a broad range of financial services and benefits for cardholders.

MasterCard, like Visa, is a leading global payment technology company that facilitates electronic transactions between consumers, merchants, and financial institutions. Here's how MasterCard's payment system typically works:

a. **Card Issuance**: MasterCard cards are issued by banks and other financial institutions. These can be credit, debit, or prepaid cards, depending on the issuing bank's offerings.
b. **Transaction Initiation**: When a cardholder makes a purchase using a MasterCard, they provide their card information at a merchant's point-of-sale terminal or online.
c. **Authorization Request**: The transaction details are sent from the merchant's point-of-sale system to the acquiring bank (the bank that partners with the merchant). The acquiring bank forwards this information to MasterCard's network.
d. **Verification**: MasterCard routes the transaction request to the cardholder's issuing bank (the bank that issued the MasterCard). The issuing bank checks if the card is valid, if there are sufficient funds or credit, and assesses any potential fraud risk.
e. **Authorization Response**: The issuing bank sends an authorization response back through MasterCard's network to the acquiring bank, and then to the merchant's point-of-sale system. If approved, the transaction proceeds; if declined, the transaction is halted.
f. **Settlement**: Once the transaction is authorized, the funds are transferred from the cardholder's account to the merchant's account. This involves the acquiring bank receiving the funds from the issuing bank through MasterCard's network.
g. **Billing**: The cardholder receives a statement or bill from their issuing bank detailing the transaction. For credit cards, the cardholder must repay the amount by the due date. For debit cards, the funds are deducted directly from the cardholder's account.
h. **Security Features**: MasterCard employs various security measures to protect transactions, such as encryption, fraud detection technologies, and tokenization. These help to prevent unauthorized access and ensure transaction security.
i. **Additional Services**: MasterCard also provides a range of services beyond transaction processing, including fraud protection programs, digital payment solutions, and global transaction support. They offer additional features like rewards programs, travel benefits, and purchase protection, depending on the card type and issuer.

3. **American Express Card:** The American Express card, commonly known as an Amex, is a range of credit and charge cards issued by American Express, a major financial services company. American Express cards are issued by American Express a publicly traded financial services company are credit cards or charge cards.

   An American Express card, also called an AmEx, can offer a variety of perks, including rewards points, cashback, and travel perks. Some cards are co-branded, such as those with Delta and Hilton. American Express is one of the few companies that issue cards and has a network to process card payments. Both Visa and MasterCard have processing networks, but they don't issue cards.
4. **Discover Card:** Discover Card is a popular credit card brand issued by Discover Financial Services, known for its rewards programs, no annual fees, and strong customer service. Here's a breakdown of the key features and types of Discover Cards:

   1. Credit Cards:

   Cashback Rewards: Discover is well-known for its cashback rewards program, offering a percentage of cashback on purchases. Many cards feature rotating categories where cardholders can earn higher cashback rates on specific types of purchases each quarter.

   No Annual Fee: Most Discover cards do not charge an annual fee, making them an attractive option for consumers who want to avoid extra costs.

   2. Travel and Miles Cards

   3. Business Cards

General Features of Discover Cards:

- **Wide Acceptance in the U.S.**: Discover cards are widely accepted across the United States, although international acceptance may be more limited compared to Visa or Mastercard. Discover is part of the Discover Global Network, which includes Diners Club International, helping to improve acceptance abroad.
- **No Foreign Transaction Fees:** Discover cards typically do not charge foreign transaction fees, making them a good choice for international travelers.
- **Introductory Offers**: Many Discover cards offer 0% APR on purchases and balance transfers for an introductory period, which can be appealing for those looking to finance a large purchase or consolidate debt.
- **Security Features:** Discover cards come with strong fraud protection, including free Social Security number alerts, and zero liability for unauthorized transactions.

PayPal: PayPal is a highly sophisticated and widely utilized online payment platform that facilitates both personal and business transactions in a secure, efficient, and scalable manner. Established in 1998, PayPal has evolved into a global financial technology powerhouse, enabling users to make payments, transfer money, and conduct business across the globe with a few simple clicks. PayPal functions as a digital wallet, allowing users to store their payment information securely, including credit and debit card details, bank accounts, and PayPal balance, all in one place. This digital wallet can then be used to make payments online, send money to friends and family, or receive payments for goods and services.

Key Features:

- **User-Friendly Interface:** PayPal's platform is designed with an intuitive user interface, making it accessible for individuals with varying levels of technical expertise. Transactions can be completed in just a few clicks.
- **Multi-Platform Accessibility**: Available on desktops, tablets, and smartphones, PayPal allows users to manage their accounts and conduct transactions from virtually anywhere.
- Advanced Encryption: PayPal employs cutting-edge encryption technologies to protect users' financial information. Sensitive data is never shared with merchants during transactions, which significantly mitigates the risk of data breaches.
- **Fraud Protection:** PayPal offers robust fraud protection, including monitoring for suspicious activity, and provides a comprehensive Purchase Protection program for eligible transactions, offering peace of mind to both buyers and sellers.
- **Multicurrency Support:** PayPal supports transactions in over 200 countries and regions, and allows users to hold balances in multiple currencies. This makes it an essential tool for international e-commerce and cross-border transactions.
- Integration with E-commerce Platforms: PayPal is widely accepted by online merchants and integrates seamlessly with major e-commerce platforms like eBay, Shopify, and Magento, enhancing its utility for businesses of all sizes.
- **Various Payment Methods:** Users can link multiple payment methods, including bank accounts, credit cards, and debit cards, and choose which to use for each transaction. PayPal also offers credit and financing options, such as PayPal Credit, which allows users to make purchases and pay over time.
- **Peer-to-Peer Transfers:** PayPal enables users to send money to others using just an email address or mobile number, making it convenient for personal transfers and splitting bills.
- Business Tools: PayPal provides a suite of services for businesses, including invoicing, payment processing, and integration with point-of-sale systems. It also offers seller protection and tools for managing refunds and disputes.

Over the years, PayPal has continually innovated and expanded its offerings. This includes the acquisition of other financial technology companies, such as Venmo, a popular peer-to-peer payment app, and Braintree, a

payment gateway for online merchants. PayPal has also ventured into cryptocurrency, allowing users in certain regions to buy, sell, and hold cryptocurrencies like Bitcoin.

Operating as a globally recognized financial institution, PayPal adheres to strict regulatory requirements across various jurisdictions. It is subject to extensive oversight by financial regulators, ensuring that it maintains compliance with international standards for financial operations, anti-money laundering (AML), and know your customer (KYC) regulations.

While PayPal offers a range of benefits, it is important to consider potential drawbacks, such as transaction fees for certain types of payments, limitations on certain types of accounts, and occasional disputes over payment holds or account restrictions. Additionally, while PayPal is widely accepted, some merchants may not support it due to the fees or prefer alternative payment methods.

In summary, PayPal is a pivotal player in the fintech ecosystem, providing a secure and versatile platform for online payments, money transfers, and business transactions. Its widespread adoption, coupled with continuous innovation and robust security measures, has solidified PayPal's position as a leader in the digital payment industry. Whether you're an individual looking to make online purchases with ease or a business seeking to expand globally, PayPal offers the tools and services necessary to facilitate efficient financial transactions in the digital age.

Virtual currency:

Virtual currency is a type of digital currency that is typically unregulated and exists only in electronic form. Unlike traditional currencies issued by governments, virtual currencies are decentralized and often operate on blockchain technology, which provides security and transparency.

Examples of virtual currencies:

Bitcoin (BTC): The first and most well-known cryptocurrency, used as a digital store of value and a medium of exchange.

Ethereum (ETH): A cryptocurrency that supports smart contracts and decentralized applications (dApps).

Ripple (XRP): A digital payment protocol and cryptocurrency designed for fast, low-cost international money transfers.

Litecoin (LTC): A peer-to-peer cryptocurrency like Bitcoin but with faster transaction times and a different hashing algorithm.

Advantages of Virtual Currency:

Decentralization: Most virtual currencies, like Bitcoin, are decentralized, meaning they are not controlled by any government or central authority, reducing the risk of manipulation or interference.

Lower Transaction Costs: Transactions involving virtual currencies often have lower fees compared to traditional banking or credit card transactions, especially for international transfers.

Fast Transactions: Virtual currencies enable near-instantaneous transactions, which can be particularly beneficial for international payments.

Financial Existence: Virtual currencies can provide access to financial services for people in regions without traditional banking infrastructure.

Security and Transparency: Blockchain technology, which underpins many virtual currencies, offers high security and transparency due to its immutable and public ledger.

Privacy: Some virtual currencies offer higher levels of privacy than traditional payment methods, allowing users to conduct transactions without revealing personal information.

Disadvantages of Virtual Currency:

Instability: The value of virtual currencies can be highly volatile, leading to significant price fluctuations, which can result in financial losses.

Lack of Regulation: The unregulated nature of virtual currencies can lead to risks such as fraud, money laundering, and market manipulation.

Limited Acceptance: While growing, virtual currencies are not yet widely accepted as a form of payment by businesses and institutions, limiting their usability.

Security Risks: Although blockchain is secure, virtual currency wallets and exchanges can be vulnerable to hacking, leading to potential loss of funds.

Irreversible Transactions: Once a virtual currency transaction is made, it cannot be reversed, which can be problematic in cases of fraud or accidental transactions.
Irreversible Transactions: Energy Consumption: Mining and maintaining certain virtual currencies, like Bitcoin, can consume significant amounts of energy, raising environmental concerns.