

Subject- 3.7 E-COMMERCE

OMCA-3rd

UNIT - I

E-commerce, short for electronic commerce, refers to the buying and selling of goods and services over the internet. It's a digital way for businesses and consumers to interact, transact, and exchange value without needing to meet in person.

Key Features of E-commerce

- **Online transactions:** Products or services are purchased through websites, apps, or online marketplaces.
- **Digital payments:** Payments are made using credit/debit cards, mobile wallets, UPI, or net banking.
- **Global reach:** Sellers can reach customers across the world, breaking geographical barriers.
- **Convenience:** Shoppers can browse, compare, and buy anytime—24/7.

History of E-Commerce

E-commerce (**short for *electronic commerce***) means buying and selling goods and services over the internet

1. **1960s – The Beginning (Before Internet)**
 - Businesses started using computers to send business documents (like orders or invoices) electronically through a system called **EDI (Electronic Data Interchange)**.
2. **1990s – Internet Boom**
 - The internet became public.
 - In 1995, **Amazon** and **eBay** were launched — two of the first big e-commerce companies.
 - People started shopping online for the first time.
3. **2000s – Growth Period**
 - More businesses went online.
 - Online banking, digital payments (like PayPal), and online stores became common.
4. **2010s – Mobile and Social E-Commerce**
 - People began shopping using smartphones (mobile commerce or m-commerce).
 - Social media apps like Facebook and Instagram started supporting online selling.
5. **2020s – Fast Delivery & Global Growth**
 - E-commerce exploded during the COVID-19 pandemic.
 - New tech like AI, chatbots, and drone delivery started being used.

Framework of E-Commerce

A **framework** means the basic structure or building blocks. Here's what e-commerce is made of:

1. Website or App

- Where customers see products and place orders.
- Examples: Amazon app, Flipkart website, Shopify store.

2. Product/Service Catalog

- List of items or services for sale with descriptions, prices, and pictures.

3. Shopping Cart

- A virtual cart where customers add products before checkout.

4. Payment Gateway

- A system that processes online payments securely (credit cards, UPI, PayPal, etc.).

5. Order Management System

- Tracks order status from placement to delivery.

6. Logistics & Delivery

- Warehousing, packaging, shipping, and delivery of goods to the customer.

7. Customer Support

- Help through chat, email, or phone to solve issues or take feedback.

8. Security System

- Protects customer data and payment details from hackers.

Basics of E-Commerce

E-commerce means **buying and selling products or services over the internet**. It can be between businesses, customers, or both.

Main Types of E-Commerce:

1. **B2C** (Business to Consumer)
→ Businesses sell to individual customers
Example: Amazon, Myntra
2. **B2B** (Business to Business)
→ Companies sell to other companies
Example: Alibaba, IndiaMART
3. **C2C** (Consumer to Consumer)
→ People sell to other people
Example: OLX, eBay
4. **C2B** (Consumer to Business)
→ People offer products/services to companies
Example: Freelancers on Fiverr, Upwork

Common Tools Used in E-Commerce

These tools help in building, running, and growing an e-commerce business:

1. E-Commerce Platforms

Used to create and manage online stores.

Examples:

- Shopify

2. Payment Gateways

Used to accept payments online securely.

Examples:

- Paytm

3. Logistics & Delivery Tools

Used to manage shipping, tracking, and delivery.

Examples:

- Blue Dart

4. Inventory Management Tools

Keep track of stock, orders, and reorders.

Examples:

- Zoho Inventory
- TradeGecko (now QuickBooks Commerce)

5. Marketing Tools

Help attract and engage customers.

Examples:

- Google Ads (for paid marketing)

- Facebook Ads Manager

6. Customer Support Tools

Used to chat with or help customers.

Examples:

- WhatsApp Business
- Zendesk

7. Security Tools

Protect data and ensure safe transactions.

Examples:

- SSL Certificates (like GoDaddy SSL)

8. Analytics Tools

Help understand user behavior and improve sales.

Examples:

- Google Analytics

comparison between web based with traditional business

Web-Based Business vs Traditional Business

Aspect	Web-Based Business	Traditional Business
Location	Online, no physical shop needed	Physical location/store is required
Cost	Lower setup and maintenance cost	Higher cost (rent, utilities, staff, etc.)
Reach	Global – can sell to anyone with internet	Local or limited area
Working Hours	24/7 (Open all the time)	Fixed hours (e.g., 10 AM – 9 PM)
Customer Interaction	Virtual (chat, email, phone)	Face-to-face interaction
Inventory Management	Can use automated tools and dropshipping	Needs physical space for storing stock
Marketing	Digital marketing (SEO, ads, social media)	Traditional marketing (posters, word of mouth)
Payment Methods	Online payments (UPI, cards, wallets)	Mostly cash or card
Scalability	Easy to scale quickly across cities/countries	Expensive and slower to expand
Setup Time	Quick – can launch a website in days	Slower – needs licenses, space, stock, etc.
Customer Trust	Needs to build trust online (ratings, reviews)	Often trusted due to personal connection
Examples	Amazon, Flipkart, Myntra, Nykaa	Local grocery shop, clothing store, restaurant

Web-based business is faster, cheaper, and has a wider reach.

Traditional business offers personal contact and local trust, but costs more to run.

Growth of E-Commerce: Present, Future & Potential

1. Present Growth of E-Commerce (2024–2025)

E-commerce is **growing very fast**, especially after COVID-19 changed shopping habits.

- More people are shopping online than ever before.
- Mobile apps and one-day delivery services are booming.
- Social media platforms like Instagram and Facebook now allow shopping directly.
- Popular categories: clothing, electronics, groceries, medicines, and education.
- Small businesses and even villages are joining online marketplaces (via Amazon, Meesho, etc.).

Example:

- India's e-commerce market crossed **\$100 billion in 2024**.
- Platforms like Amazon, Flipkart, Nykaa, and Blinkit are growing rapidly.

2. Future Growth of E-Commerce (2025 & Beyond)

The future of e-commerce looks even more exciting and powerful.

Expected Trends:

- **AI and Chatbots** will improve shopping experience (personalized suggestions).
- **Voice Shopping** (like saying “order shampoo” to Alexa).
- **Drone Deliveries** for faster shipping in some cities.
- **Augmented Reality (AR)** to try products virtually (like glasses or furniture).
- **Green E-Commerce** – focus on eco-friendly packaging and delivery.
- **Rural Expansion** – more internet in villages means more rural online shopping.

By 2030 (Global Estimates):

- The global e-commerce market may cross **\$8–10 trillion**.
- India could become the **3rd-largest** e-commerce market after China and the US.

3. Potential of E-Commerce

E-commerce still has **huge potential** to grow in many areas:

Untapped Areas:

- Rural and remote regions with growing internet access.
- Older generations starting to shop online.
- New sectors like online healthcare, digital education, and home services.

 *Business Opportunities:*

- Small sellers and artisans can now sell nationally or globally.
- Dropshipping and affiliate marketing allow people to earn online without big investments.
- Local shops are going hybrid (offline + online).

Socio economic impact of e commerce

The **socio-economic impact of e-commerce** is significant and multifaceted, affecting individuals, businesses, communities, and national economies. Here's a breakdown of the **key social and economic effects** of e-commerce:

Economic Impact

1. Business Growth & Market Expansion

- **Global reach:** Small businesses can now sell internationally, reducing dependence on local markets.

- **24/7 operations:** Online stores remain open around the clock, increasing sales opportunities.
 - **Lower operational costs:** E-commerce reduces the need for physical stores, cutting rent and staffing expenses.
- 2. Job Creation & Transformation**
- **New job opportunities:** Growth in sectors like logistics, digital marketing, IT, and customer support.
 - **Gig economy expansion:** Freelancers and part-timers benefit from platforms like Amazon, Etsy, Upwork, etc.
 - **Skill shifts:** Increased demand for digital literacy, e-commerce management, and data analysis.
- 3. Impact on Traditional Retail**
- **Decline in brick-and-mortar stores:** Many physical retailers face closures or reduced sales.
 - **Hybrid business models:** Retailers adopt online-offline strategies to stay competitive (e.g., click-and-collect).
- 4. Supply Chain & Logistics Innovation**
- Growth in **last-mile delivery**, **automation**, and **inventory optimization**.
 - Rise of **third-party logistics (3PL)** and **dropshipping** models.
- 5. Taxation and Regulation Challenges**
- Difficulties in taxing cross-border e-commerce transactions.
 - Governments are developing new policies to capture online sales revenue.

Social Impact

- 1. Increased Consumer Access & Convenience**
- Rural and remote areas can access goods and services not available locally.
 - Greater variety and competitive pricing benefit consumers.
- 2. Digital Divide**
- Populations without internet access or digital literacy are excluded from e-commerce benefits.
 - Can deepen socio-economic inequalities between urban and rural or rich and poor regions.
- 3. Changing Consumer Behavior**
- Instant gratification culture due to fast delivery and digital convenience.
 - Shifts toward mobile shopping, personalized recommendations, and cashless payments.
- 4. Environmental Effects**
- **Positive:** Reduction in commuting/shopping trips may lower carbon emissions.
 - **Negative:** Increase in packaging waste and delivery-related pollution.
- 5. Empowerment of Entrepreneurs**
- Individuals, especially women and marginalized groups, can start businesses with minimal capital.
 - Platforms like Shopify, Amazon, and social commerce tools enable self-employment and financial independence.

UNIT - II

E – Business

Meaning of E-Business:

E-Business (Electronic Business) refers to the use of internet and digital technologies to conduct business processes and activities. It involves buying and selling of goods and services, servicing customers, and collaborating with business partners using digital platforms.

It goes beyond **e-commerce** (which focuses mainly on buying and selling online) by including other aspects like:

- Online customer support
- Supply chain management

- Digital marketing
- Electronic data interchange (EDI)
- Online inventory control and management

Importance of E-Business:

1. **Global Reach:**
 - Businesses can reach customers across the world, 24/7, breaking geographical boundaries.
2. **Cost Efficiency:**
 - Reduces costs related to physical infrastructure, staffing, and paperwork.
3. **Improved Customer Experience:**
 - Enables personalized services, instant support, and faster transactions.
4. **Faster Business Operations:**
 - Automates processes such as order processing, payments, and inventory tracking.
5. **Increased Competitiveness:**
 - Allows businesses to respond quickly to market changes and customer demands.
6. **Flexibility and Convenience:**
 - Customers can shop from anywhere at any time, and businesses can operate remotely.
7. **Access to Data and Analytics:**
 - Provides valuable insights into consumer behavior and market trends, helping improve decision-making.
8. **Innovation and New Opportunities:**
 - Opens the door to new business models such as dropshipping, subscription services, and digital goods.

E-Commerce Models

E-commerce transactions can be classified into different models based on **who is buying and who is selling**. Here are the **four major types**:

1. B2B – Business to Business

A business sells products or services to another business.

Examples:

- **Alibaba.com** – bulk purchases by retailers
- **IndiaMART, ThomasNet, Amazon Business**

Characteristics:

- High-volume transactions
- Long-term relationships
- Negotiated pricing
- Often involves wholesale or industrial goods

Use Cases:

- Manufacturers selling to distributors

2. B2C – Business to Consumer

A business sells products or services directly to individual customers.

Examples:

- **Amazon, Flipkart, Zara, Netflix**

Characteristics:

- Large customer base
- Standard pricing
- Fast order cycle
- Focus on user experience

Use Cases:

- Retail products

3. C2C – Consumer to Consumer

Individuals sell products or services to other individuals, usually through a third-party platform.

Examples:

- **eBay, OLX, Facebook Marketplace, Poshmark**

Characteristics:

- Peer-to-peer transactions
- Often involves second-hand goods
- Platforms provide trust, payment, and dispute resolution

Use Cases:

- Selling used electronics, clothes, furniture

4. C2B – Consumer to Business

Individuals (consumers) offer products or services to businesses.

Examples:

- Social media influencers promoting brands

Characteristics:

- Individuals set prices or submit proposals
- Businesses choose from bids or hire talent
- Popular in digital services and gig economy

Present Status of E-Commerce in India

1. Fast Growth

- E-commerce in India is growing very quickly.
- It is worth around **₹13 lakh crore** (about **\$150 billion**) in 2025.

2. More Online Shoppers

- Over **34 crore (340 million)** people shop online.
- Most people use **mobile phones** to shop.

3. Small Cities Are Leading

- More than **60% of online orders** now come from **Tier 2 and Tier 3 cities**.
- Villages and small towns are joining the online shopping trend.

4. Digital Payments Are Popular

- People use **UPI, PhonePe, Google Pay, Paytm**, etc.
- Cash-on-delivery is still used but less common than before.

5. Most Bought Products

- **Clothes, mobile phones, electronics, and groceries** are the top categories.
- Apps like **Amazon, Flipkart, Meesho, BigBasket, and JioMart** are popular.

6. Quick Delivery is Trending

- Apps like **Blinkit, Zepto, Instamart** deliver groceries in **10–20 minutes**.
- This is called **Quick Commerce (Q-Commerce)** and is growing in big cities.

7. Government Support

- Platforms like **ONDC** help small businesses sell online.
- **GeM** (Government e-Marketplace) supports government-related e-commerce.

8. Big Companies Competing

- Companies like **Amazon, Flipkart, Reliance, Tata, and Meesho** are in strong competition.
- Many are offering big discounts and faster services.

9. Challenges Remain

- Local shops are losing business due to online stores.
- Quick delivery is expensive and not always profitable.
- Government is keeping a close eye on big companies for fair practices.

10. Future Looks Bright

- The market may reach **₹30–40 lakh crore** by 2030.
- More people will shop online as internet access spreads.

Regulatory Aspects of E-Commerce in India

Regulatory aspects mean the **rules and laws** that the **government sets to control and guide** how a business or activity works.

1. **Foreign Direct Investment (FDI) Rules**
 - Foreign companies like Amazon can only act as a **marketplace**, not sell their own products directly.
 - FDI is **not allowed** in inventory-based e-commerce for B2C (business to consumer).
2. **Marketplace Model Rules**
 - Platforms like Amazon and Flipkart must only **connect buyers and sellers**.
 - They **cannot control prices** or own the products they sell.
3. **Product Information (Labelling Rules)**
 - E-commerce websites must show **MRP, brand name, size, origin**, etc. clearly on the product page.
 - This is part of **Legal Metrology (Packaged Commodities) Rules, 2011**.
4. **Consumer Protection (E-commerce) Rules, 2020**
 - Protects buyers from fake products and unfair practices.
 - Platforms must:
 - Show **seller details** clearly
 - Have a proper **return & refund policy**
5. **Data Privacy & Protection**
 - E-commerce platforms must keep customer data **safe and private**.
 - They must follow IT Act, 2000 and upcoming **Digital Personal Data Protection Act**.
6. **GST and Taxation**
 - E-commerce sellers and platforms must register under **GST**.
 - Platforms must **collect and deposit tax** (TCS - Tax Collected at Source) on sales.
7. **Ban on Unfair Practices**
 - Platforms should not give **preferential treatment** to certain sellers.
 - Deep discounts and fake flash sales are discouraged by regulators.
8. **Return & Cancellation Rules**
 - Customers must be allowed to **easily return** or cancel products if not satisfied or if the item is defective.
9. **Invoice and Billing Rules**
 - Every online purchase must come with a **valid bill/invoice**, showing all charges clearly.
10. **Monitoring by Authorities**
 - Regulators like **CCI (Competition Commission of India)**, **Department for Promotion of Industry and Internal Trade (DPIIT)**, and **Ministry of Consumer Affairs** keep a watch on e-commerce practices.

Impact of E-Commerce on Various Sectors

1. Entertainment Sector

1. People can now **watch movies, shows, and listen to music online** anytime using apps like **Netflix, Amazon Prime, Spotify, YouTube**, etc.

2. No need to buy CDs or go to theatres – everything is **digitally available** at home.
3. Artists and creators can **sell music, art, or content online** easily.
4. E-commerce helps sell **movie tickets, merchandise, and games** through platforms like **BookMyShow** or online stores.

2. Education Sector

1. Students can buy books, courses, and study materials online.
2. Platforms like Byju's, Unacademy, Udemy, Coursera offer online classes and certifications.
3. E-learning has made education accessible to remote villages.
4. Teachers and tutors can teach and earn from home using digital platforms.
5. Exams, notes, assignments – everything can now be shared digitally.

3. Health Services Sector

1. People can book doctor appointments online using apps like Practo, Tata 1mg.
2. Medicines can be ordered online and delivered at home.
3. E-commerce supports telemedicine – doctors can treat patients via video call.
4. Health reports and test results are available digitally.
5. Buying health products, vitamins, and wellness items is now very easy online.

UNIT – III

Internet Resources for commerce

Internet resources are the tools, websites, and services available online that help businesses do their work better and faster.

For example:

- Websites and online stores like Amazon, Flipkart
- Payment systems like Paytm, Google Pay
- Communication tools like email, WhatsApp, video calls
- Advertising platforms like Google Ads, Facebook Ads
- Business software available on the cloud like online accounting, inventory management

Technologies for Web Servers

Web Server

A **web server** is a **computer or software** that stores websites and **sends them to users** when they visit using a browser (like Chrome or Firefox).

Think of it as a **waiter** in a restaurant who brings the **menu (website)** to your **table (browser)** when you ask for it.

Technologies Used for Web Servers

1. **HTTP/HTTPS (Protocols)**
 - These are the rules that help web servers send web pages to browsers.
 - HTTPS is secure and protects your data.
2. **Web Server Software**

These are programs that run on the server to manage websites.

 -  Apache – Most common, free, and open-source

- 🦋 Nginx – Fast and lightweight, used for big websites
 - 📁 Microsoft IIS – Used in Windows-based systems
 - ⚙️ LiteSpeed – Known for high performance and speed
3. **Operating Systems**
 - Web servers need an operating system to work.
 - Common ones are Linux, Windows Server, and Ubuntu.
 4. **Databases**
 - Store website data (like user info, orders, posts).
 - Examples: MySQL, MongoDB, PostgreSQL
 5. **Server-Side Languages**
 - These help the server to process requests and give dynamic results.
 - Examples: PHP, Python, Node.js, Java, Ruby
 6. **Control Panels**
 - These are tools to manage web servers easily without using code.
 - Examples: cPanel, Plesk
 7. **Cloud Hosting Technologies**
 - Many websites now use cloud servers (like AWS, Google Cloud, Azure) for better speed and flexibility.

Internet Tools Relevant to Commerce

These are the tools available on the internet that help businesses in **buying, selling, communicating, marketing, and managing work** online.

1. **E-Commerce Platforms**
 - Help businesses sell products online.
 - Examples: Amazon, Flipkart, Shopify, Meesho
2. **Online Payment Tools**
 - Used to send and receive money safely online.
 - Examples: Paytm, PhonePe, Google Pay, Razorpay, PayPal
3. **Email Services**
 - Used to communicate with customers and employees.
 - Examples: Gmail, Outlook, Zoho Mail
4. **Digital Marketing Tools**
 - Help businesses to advertise their products and reach more people.
 - Examples:
 - Google Ads (ads on websites and YouTube)
 - Facebook Ads
5. **Analytics Tools**
 - Help to track website traffic and customer behavior.
 - Examples:
 - Google Analytics
 - Facebook Insights
6. **Cloud Storage Tools**
 - Used to store and share business files online safely.
 - Examples: Google Drive, Dropbox, OneDrive
7. **Business Management Tools**
 - Help in managing tasks, employees, and customer support.
 - Examples:
 - Trello, Asana (task management)
 - Slack, Microsoft Teams (team communication)
8. **Website Creation Tools**
 - Help to create and manage websites easily without coding.
 - Examples: Wix, WordPress, Shopify, Squarespace

9. Inventory & Billing Tools

- Help track product stock and generate bills/invoices.
- Examples: Tally ERP
- Help businesses talk to customers and solve problems online.
- Examples: **WhatsApp Business**,

Internet Applications for Commerce

These are the **ways in which the internet is used to support business and commercial activities** like buying, selling, marketing, payments, and customer service.

Internet Applications for Commerce:

1. Online Shopping (E-Commerce)

- Buying and selling products and services using websites or apps.
- Examples: **Amazon, Flipkart, Meesho, Myntra**

2. Online Payment Systems

- Sending or receiving money safely using the internet.
- Examples: **UPI (Google Pay, PhonePe), Paytm, Razorpay, PayPal**

3. Email Communication

- Sending and receiving messages, bills, offers, or customer support through email.
- Examples: **Gmail, Outlook, Zoho Mail**

4. Online Marketing & Advertising

- Promoting products using internet tools like social media, Google Ads, or email marketing.
- Examples: **Facebook Ads, Instagram Ads, Mailchimp, Google Ads**

5. Website for Business

- Having a company website to show products, share information, and connect with customers.
- Examples: **Business websites made with WordPress, Wix, Shopify**

6. Customer Support Tools

- Using chat, email, or bots to solve customer problems online.
- Examples: **WhatsApp Business, Live Chat, Freshdesk, Chatbots**

7. Inventory & Order Management

- Managing stock and tracking orders using online tools.
- Examples: **Zoho Inventory, Tally, Vyapar App**

8. Billing and Invoicing

- Creating and sending bills or invoices online.
- Examples: **Zoho Books, QuickBooks, Razorpay Billing**

9. Market Research & Data Analytics

- Studying customer behavior and website visits to make better business decisions.
- Examples: **Google Analytics, Hotjar, SEMrush**

10. Cloud Storage and File Sharing

- Storing and sharing business documents online.
- Examples: **Google Drive, Dropbox, OneDrive**

Advertising on the Internet – Issues and Technologies

It means showing ads on websites, apps, or social media to promote products or services using the internet.

Technologies Used in Internet Advertising

These are tools and platforms that help in showing, targeting, and tracking ads:

1. Ad Networks

- Platforms that connect advertisers with websites/apps to display ads.
- Example: **Google AdSense, Media.net**

2. Programmatic Advertising

- Uses **AI and automation** to buy and place ads in real-time.
- Saves time and targets the **right users automatically**.

3. Search Engine Advertising (SEA)

- Ads shown on search engines like **Google** when someone searches.
- Example: **Google Ads (formerly AdWords)**

4. Social Media Advertising

- Ads shown on platforms like **Facebook, Instagram, YouTube, Twitter**.
- Helps reach **target audiences** based on age, location, interests, etc.

5. Display Ads & Banner Ads

- **Images or videos** that appear on websites and apps.
- Can be placed using ad networks or directly by advertisers.

6. Video Ads

- Shown before or during videos on **YouTube, OTT apps** (like Hotstar, Netflix).
- Very engaging and often used by big brands.

7. Email Marketing Tools

- Sending ads or offers directly to people's inboxes.
- Tools: **Mailchimp, Constant Contact**

Issues in Internet Advertising

1. Privacy Concerns

- User data is often tracked to show ads.
- People worry their **personal information** is not safe.

2. Ad Fraud

- Fake clicks or views done by bots, not real people.
- Wastes advertiser money.

3. Ad Blockers

- Many users install ad blockers, so ads are **not shown** at all.

4. Too Many Ads (Ad Overload)

- Seeing too many ads can **annoy users** and make them avoid websites.

5. Fake or Misleading Ads

- Some online ads show **false information** or **scam offers**.

6. Targeting Accuracy

- Sometimes ads are shown to **wrong people**, which is a waste of money.

Advertising on the Web

Web advertising (also called online or internet advertising) means promoting products or services using websites, apps, or search engines.

It helps businesses reach customers **anywhere, anytime** through the internet.

Types of Web Advertising

1. **Banner Ads**
 - Image ads shown on top, side, or middle of websites.
 - Example: Ads you see on news or blog sites.
2. **Search Engine Ads**
 - Ads that appear when you **search something on Google or Bing**.
 - Example: The top results marked as “Sponsored”.
3. **Social Media Ads**
 - Ads shown on **Facebook, Instagram, Twitter, LinkedIn**, etc.
 - Targeted based on **age, location, interest**, etc.
4. **Video Ads**
 - Ads played before or during videos on **YouTube, Hotstar**, etc.
5. **Pop-up Ads**
 - Small windows that **"pop up"** when you open a site.
6. **Email Ads (Email Marketing)**
 - Promotional emails sent directly to your inbox.
7. **Influencer or Affiliate Ads**
 - Ads promoted by **influencers or bloggers** through their websites or social media.

Marketing by Creating a Website

Creating a website for marketing means making a website to:

- Show your **products or services**
- Attract **new customers**
- **Promote your brand**
- Help people **know about your business**

Website is Useful for Marketing

1. You can **reach people all over the world**
2. Your website works **24 hours a day**
3. People can **find you on Google**
4. You can **advertise your products or offers**
5. Customers can **contact you easily**

Introduction to Electronic Payment System (E-Payment)

- An **electronic payment system** is a way to **pay money using the internet or digital methods**, instead of using cash or cheques.
- It helps people and businesses make **quick, safe, and paperless payments**.
- Commonly used in **online shopping, bill payments, mobile recharge, ticket booking**, etc.

Benefits of E-Payment Systems:

- **Fast** – Transactions happen in seconds
- **Secure** – Encrypted and safe
- **Paperless** – No need for physical receipts
- **Anywhere, Anytime** – Pay from mobile or computer
- **Trackable** – Every payment is recorded

Types of Electronic Payment Systems

1. Credit Card / Debit Card Payments

- Physical cards used **for** online or POS payments.

2. Mobile Wallets (E-Wallets)

- Apps where you store money digitally and pay directly.

3. UPI (Unified Payments Interface)

- Instant payment between bank accounts using a mobile number or UPI ID.

4. Net Banking (Online Banking)

- Paying directly from your bank account using the bank's website or app.

5. Payment Gateways

- A service that helps businesses collect online payments **from** customers.

6. Electronic Funds Transfer (EFT / NEFT / RTGS / IMPS)

- Bank-to-bank money transfer methods.

7. EMI Payment Systems

- Used to buy now and pay later in parts (monthly).

E-Cash and Currency Servers

E-Cash (Electronic Cash)

- E-Cash is digital money used for making payments over the internet.
- It works like physical cash, but you store and use it on your mobile or computer.
- You can use e-cash to buy things online, pay for services, or transfer money.

Main Features of E-Cash:

- No need for physical cash
- Secure and private
- Fast payments
- Can be used on websites or apps

Examples of E-Cash in Daily Life:

- Wallet balance in Paytm, Amazon Pay, PhonePe

Currency Servers

- Currency servers are special computers or systems that manage, verify, and track e-cash transactions.
- They make sure that:
 - The digital money is valid
 - It is not used more than once (no double-spending)
 - The transaction is safe and complete

Functions of a Currency Server:

1. Generates E-Cash
 - Creates and issues e-cash tokens (like digital coins)
2. Authenticates Transactions
 - Checks if the payment is real and from the right person
3. Prevents Double Spending
 - Makes sure e-cash is not reused illegally
4. Records Transactions
 - Keeps track of how much e-cash is used, sent, or received

E-Cheque (Electronic Cheque)

- An **electronic version of a paper cheque**.
- It is used to **transfer money from one bank account to another** over the internet.

Features:

- Works just like a normal cheque
- Can be signed using **digital signatures**
- Safe and **paperless**
- Used for **online payments** or **bank transfers**

Example: *Paying a utility bill online using your bank's e-cheque system.*

2. Credit Card

A plastic card given by banks or companies to borrow money for shopping or payments.

Advantages of Credit Card

- **Buy now, pay later**—flexible payment options
- Can build your **credit history and credit score**
- Useful in emergencies when you don't have cash
- Offers **rewards, cashback, discounts, and offers**
- Comes with **fraud protection** and dispute resolution
- Can pay bills and shop online securely
- Option for **EMI (installments)** on big purchases

Disadvantages of Credit Card

- If not paid on time, you'll pay **high interest charges**
- Can lead to **debt and overspending**
- May have **annual fees and hidden charges**
- Poor usage can **harm your credit score**
- Sometimes credit limits may be **low** or get reduced
- You pay the money back **later**, usually every month.

Smart Card

A **card with a microchip** that **stores your data** (money, ID information. it Can be used to **make secure payments** or **identify a user**.

Advantages of Smart Card

1. **High Security**
 - Stores data securely using a microchip, making it hard to copy or hack.
2. **Multi-Purpose Use**
 - Can be used for payments, identification, access control, health records, and more.
3. **Fast Transactions**
 - Payments and data reading happen quickly when you tap or insert the card.
4. **Portable and Durable**
 - Small and easy to carry, more durable than magnetic stripe cards.
5. **Can Store More Data**
 - Stores more information than traditional cards, enabling advanced features.
6. **Reduces Fraud**
 - Difficult to clone or counterfeit compared to regular cards.

Disadvantages of Smart Card

1. **Costly to Produce**
 - More expensive to manufacture than regular magnetic stripe cards.
2. **Requires Special Readers**
 - Needs smart card readers or compatible machines, which may not be available everywhere.
3. **Technical Issues**
 - Chip can get damaged or malfunction, making the card unusable.
4. **Compatibility Problems**
 - Not all merchants or systems accept smart cards yet, especially in rural or less-developed areas.
5. **Data Privacy Concerns**
 - If not managed properly, stored personal data might be at risk.

Electronic Wallet (E-Wallet)

- An **electronic wallet** is a **digital app or software** that stores your money **electronically**.
- It lets you **pay online or in stores** without using cash or cards.
- Think of it like a **digital purse or wallet** on your phone or computer.

E-Wallet Work

1. You **add money** to your e-wallet from your bank account, debit/credit card, or cash at a shop.
2. When you buy something online or offline, you **pay using your e-wallet**.
3. The money is **deducted instantly** from your e-wallet balance.
4. You can also **send or receive money** from friends or family using the wallet.

Popular Examples of E-Wallets

- **Paytm**
- **Google Pay**
- **PhonePe**
- **Amazon Pay**

- **Apple Pay**

Advantages of E-Wallets

- **Fast and easy payments**
- Can link to your bank account or cards
- Pay using mobile phone anytime, anywhere
- No need to carry cash or cards
- Often offer **cashbacks and discounts**
- Usually have security features like passwords or OTPs

Disadvantages of E-Wallets

- Need internet connection to use
- If phone is lost or hacked, risk of money theft
- Limited to the amount of money in the wallet
- Refunds can sometimes be slow
- Some merchants may **not accept e-wallet payments**

Debit Card: Advantages and Disadvantages

A **debit card** is a **plastic or digital card** given by a **bank** that allows you to **spend money directly from your bank account**.

Advantages of Debit Card

- **Spend your own money** directly from your bank account
- **Easy to use** for shopping online and offline
- **No interest charges** since you are using your own money
- **Instant payment**—money is deducted immediately
- **Widely accepted** at stores, ATMs, and websites
- Usually comes with **fraud protection**

Disadvantages of Debit Card

- **No credit facility**—you can only spend what you have
- If money is low in the account, payment will **fail**
- Sometimes takes time to **refund** if fraudulent transactions happen
- May get declined if there's a **technical or network issue**
- Limited benefits or rewards compared to credit cards

Internet Monetary Payment and Security System

- **Internet Monetary Payment System** means **paying money online** using digital methods like **debit cards, credit cards, UPI, net banking, e-wallets**, etc.
- **Security System** means the **methods used to keep these online payments safe** from fraud, theft, or misuse.

Types of Internet Payment Systems:

1. **Credit / Debit Card Payments**
 - Use card number, expiry date, and OTP to make secure payments.
2. **UPI (Unified Payments Interface)**
 - Instant payment using UPI ID or mobile number.
 - Example: Google Pay, PhonePe

3. Net Banking

- Paying directly from your bank account using the bank's website.

4. E-Wallets

- Store money digitally and pay easily.
- Example: Paytm, Amazon Pay, PhonePe

5. Payment Gateways

- A service that processes online payments for websites.
- Example: Razorpay, CCAvenue

Security Requirements for Internet Payments

To protect online money transactions, certain **security requirements** must be followed:

1. Authentication

- To **confirm the identity** of the user.
- Example: Username + Password, OTP (One Time Password), Fingerprint.

2. Authorization

- To **ensure the user is allowed** to make the payment.
- Example: The system checks if your card or bank account has enough balance and permission.

3. Encryption

- Converts sensitive information (like card numbers) into **secret code**.
- Keeps your data **safe from hackers** during transmission.

4. Data Integrity

- Makes sure the information is **not changed or tampered** with during transfer.
- Helps in **secure and accurate transactions**.

5. Confidentiality

- Ensures that your payment details (card number, CVV, passwords) are **kept private**.
- Only authorized systems can **read or process your information**.

6. Non-repudiation

- Prevents anyone from **denying** that they made a payment.
- Ensures proof of transaction is recorded.

Other Security Features Used:

- **SSL Certificate** – Secures the website connection.
- **Digital Signature** – Confirms that data is from a trusted sender.
- **Two-Factor Authentication (2FA)** – Extra layer of security using OTP or fingerprint.
- **PCI-DSS Compliance** – Global security standard for card payments.

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Electronic Data Interchange

Digital Signatures

A digital signature is like an electronic version of your handwritten signature, but more secure.

Benefits of Digital Signatures

- **High Security** – Very hard to fake or change
- **Proof of Identity** – Confirms who signed the message
- **Easy to use** – Used in emails, PDFs, and online forms
- **Legal Validity** – Recognized by law in many countries (like India)

Limitations of Digital Signatures

- Needs **special software or tools** to create and verify
- If the **private key is lost or stolen**, it can cause problems
- Requires **internet and system compatibility**

Digital Signatures Used

1. E-filing income tax returns
2. Signing legal or government documents online
3. In businesses for contracts and invoices
4. In banks for secure transactions

Cryptography

Cryptography is the science of **protecting information** by changing it into a **secret code** so that **only the right person can read it**.

It helps keep **messages, data, and passwords safe** from hackers or others who should not see it.

Example:

If you write:

"Hello" → Cryptography turns it into something like → "Xy\$#@9"

Only the person who has the **key** can turn it back into "Hello".

Cryptography Important

- **Keeps data safe**
- **Protects messages and emails**
- **Secures online payments**
- **Verifies identity in digital signatures**
- **Used in banking, e-commerce, and government websites**

Types of Cryptography

1. Symmetric Key

- The **same key** is used to **encrypt** and **decrypt** the message.
- Fast but both sender and receiver must have the **same secret key**.

2. Asymmetric Key Cryptography

- Uses a **pair of keys**:
 - A **public key** (to encrypt)
 - A **private key** (to decrypt)
- More secure, used in **digital signatures** and **secure emails**.

Common Uses of Cryptography

- **Passwords** – Stored safely in encrypted form
- **Banking & UPI apps** – Your transactions are encrypted
- **Emails** – Secure messaging
- **Data Storage** – Keeps files private
- **Digital Signatures** – Verify identity and prevent tampering

Interoperability and Inter-compatibility

1. Interoperability

- Interoperability means that **different systems, apps, or devices can work together and share information easily**, even if they were made by different companies.

Example:

- You send money from **Google Pay** (UPI) to someone using **PhonePe** – both apps can talk to each other and process the payment.

Where it's used:

- UPI apps
- Healthcare systems sharing patient data
- Computer networks and software

Benefits:

-  Smooth communication between systems

-  Works across different platforms
-  Better user experience

Inter-compatibility

Meaning:

- Inter-compatibility means that **one system or device works correctly with another** without needing changes or extra tools.

EXAMPLE

- Hardware (like chargers, printers)
- Software formats (like PDF files opening in different apps)
- Websites opening in different browsers

Benefits:

- Easy to connect and use
- No format or device issues
- Saves time and cost