

E-COMMERCE & WEB APPLICATIONS DEVELOPMENT

UNIT-I

Introduction to E-Commerce: Definition, scope, and evolution, Benefits and limitations. **Types of E-Commerce:** B2B, B2C, C2C, C2B, G2C models ; E-Commerce Business Models: Revenue models (advertising, subscription, etc.) **Infrastructure for E-Commerce :** Internet, intranet, Extranet Payment gateways and digital wallets Legal and Ethical Issues: Cyber laws and data privacy, Intellectual property, taxation, and security.

E-Commerce is a modern method of doing business through the internet. It helps businesses, sellers, and customers to reduce costs, improve product quality, and deliver goods faster. In e-commerce, all business information such as orders, payments, and bills is exchanged electronically without using paper.

Definition of E-Commerce:-

→ E-Commerce is the buying and selling of goods and services over the internet using electronic devices such as computers and mobile phones.

→ E-Commerce is a modern way of doing business where buying, selling, and exchange of information take place online using the Internet without paper.

Scope Of E-commerce:-

The scope of e-commerce refers to the areas, fields, and activities where e-commerce can be used. It explains how wide e-commerce is, where it is applied, and what opportunities it provides in business and daily life.

1. Online Shopping

Online shopping is the most common scope of e-commerce. Customers can buy products such as clothes, electronics, books, and groceries through websites and mobile applications like Amazon and Flipkart. It saves time and offers a wide variety of products.

2. Online Banking and Digital Payments

E-commerce supports online banking services such as money transfer, bill payments, and online account management. Digital payment systems like UPI, Google Pay, and PhonePe make transactions fast, easy, and secure.

3. Online Education (E-Learning)

E-commerce plays an important role in education by providing online classes, e-books, online exams, and certification courses. Students can learn anytime and from anywhere.

4. Online Ticket Booking and Reservations

E-commerce allows booking of bus, train, flight, movie, and hotel tickets online. This reduces waiting time and provides instant confirmation and easy cancellation.

5. Online Healthcare Services

Healthcare services such as online doctor consultations, ordering medicines, and accessing medical reports are provided through e-commerce platforms. It is very useful for people in remote areas.

6. Mobile Commerce (M-Commerce)

With the increase in smartphone usage, mobile commerce has become an important part of e-commerce. Shopping, banking, and payments can be done easily using mobile apps.

7. Business to Business (B2B) Transactions (one business is selling to another business.)

In B2B e-commerce, businesses buy and sell products and services with other businesses online. It helps in reducing cost, saving time, and improving supply chain management.

8. Digital Marketing and Advertising

E-commerce supports online advertising through social media, websites, and email marketing. Businesses can reach global customers at a low cost.

9. Government Services (E-Governance)

Government services such as online tax filing, online applications, and digital certificates

10. Employment Opportunities

E-commerce creates many job opportunities such as web developers, digital marketers, online sellers, and freelancers. It also supports self-employment and work-from-home options.

Evolution of E-Commerce:-

The evolution of e-commerce refers to the development and growth of electronic commerce over time. E-commerce has evolved from simple electronic data exchange systems to advanced online platforms with artificial intelligence and mobile technology.

1. Early Stage – Electronic Data Interchange (1970s–1980s)

EDI is the computer-to-computer exchange of business documents (such as purchase orders and invoices) in a standardized electronic format between business partners

In the beginning, businesses used Electronic Data Interchange (EDI) to exchange business documents such as invoices, purchase orders, and bills electronically. These systems were mainly used by large organizations and were expensive.

2. Introduction of the Internet (1990s)

The invention of the World Wide Web (WWW) in the early 1990s changed the concept of business. Companies started creating websites to display products and services. Online shopping websites began to appear.

Examples: Amazon (1994), eBay (1995)

3. Growth of Online Payments (Late 1990s–2000s)

With the development of secure payment technologies such as credit cards, debit cards, and online banking, e-commerce became more reliable. Payment gateways and encryption methods improved transaction security.

👉 Customers gained confidence in online shopping.

4. Expansion of E-Commerce Platforms (2000s)

During this period, many e-commerce platforms expanded their services. Features such as shopping carts, order tracking, customer reviews, and return policies were introduced.

👉 E-commerce became more user-friendly and popular.

5. Mobile Commerce (2010 onwards)

The widespread use of smartphones and mobile apps led to the growth of mobile commerce (m-commerce). Customers could shop anytime and anywhere using mobile applications.

👉 Mobile payments and app-based shopping increased rapidly.

6. Social Media and Digital Marketing

Social media platforms like Facebook, Instagram, and WhatsApp became important tools for marketing and selling products. Businesses started using digital marketing to reach customers globally.

👉 Social commerce emerged as a new trend.

7. Use of Advanced Technologies (Present Stage)

Modern e-commerce uses advanced technologies such as:

Artificial Intelligence (AI)

Machine Learning

Big Data Analytics

Cloud Computing

These technologies help in product recommendations, chatbots, fraud detection, and personalized shopping experiences.

Benefits of E-Commerce:-

1. Faster Buying Process

Customers can quickly search, compare, and buy products online.

They save time because they do not need to visit physical stores.

2. Cost Reduction

E-commerce reduces many costs such as:

Shop rent

Store maintenance

Staff salaries

Paperwork

Online stores require less investment compared to physical stores and are suitable for small and individual sellers.

3. Affordable Advertising and Marketing

Online promotion is cheaper and more effective.

Sellers can use:

Online ads

Images and videos

Coupons and offers

Sponsored advertisements

Customer data and insights help sellers improve sales strategies.

4. Flexibility for Customers

E-commerce stores are available 24×7.

Customers enjoy:

Home delivery

Discounts

Subscription benefits

Easy returns

Reviews help build trust and guide new buyers.

5. Product and Price Comparison

Customers can compare:

Prices

Features

Reviews

Alternatives

This helps them make better purchasing decisions quickly.

6. Faster Response to Market Demand

Sellers can:

Restock fast

Introduce trending products

Create instant offers and discounts

Respond quickly to customer needs

Market changes can be handled easily in e-commerce.

7. Several Payment Modes

E-commerce supports multiple payment options such as:

UPI

Credit/Debit cards

Net banking

Cash on delivery

EMI and pay-later options

This flexibility increases the chances of successful sales.

Limitations of E-Commerce:-

Even though e-commerce has many advantages, it also has certain limitations. These limitations affect both customers and business organizations.

1. Security Issues

Online transactions involve sharing sensitive information such as:

-Credit/debit card details

-Bank account information

-Personal data

There is a risk of hacking, fraud, and data theft, which reduces customer trust.

2. Lack of Personal Touch

In e-commerce:

-Customers cannot physically see or touch the product

-No face-to-face interaction with the seller

-This may lead to dissatisfaction, especially for products like clothes, furniture, and electronics.

3. Dependence on Internet and Technology

E-commerce completely depends on:

-Internet connectivity

-Computers or smartphones and Electricity

If there is network failure or server issues, online shopping becomes impossible.

4. Delivery Delay

Unlike traditional shopping where customers get products immediately:

- E-commerce products require shipping time
- Delays may occur due to logistics, weather, or transport problems

This is inconvenient for urgent purchases.

5. Product Quality Issues

Sometimes the product delivered may:

- Look different from online images
- Be damaged or defective
- Not match customer expectations

This leads to returns and customer dissatisfaction.

6. Technical Problems

E-commerce websites may face:

- Server crashes
- Software bugs
- Payment gateway failures

These technical issues can interrupt business operations and cause loss.

Types of E-Commerce:-

E-Commerce (Electronic Commerce) refers to buying and selling of goods, services, and information using the internet. Based on the nature of buyers and sellers, e-commerce is divided into different types.

1. B2C-Business to Consumer
2. B2B – Business to Business
3. C2C – Consumer to Consumer
4. C2B – Consumer to Business
5. B2G – Business to Government
6. G2C – Government to Citizen

1. B2C-Business to Consumer:-

B2C (Business to Consumer) is a type of e-commerce where businesses sell goods and services directly to individual customers through online platforms. It is the most common form of e-commerce. Examples include Amazon, Flipkart, Swiggy, and Netflix. It allows customers to shop online anytime and anywhere.

Ex:-

- Amazon selling mobiles to customers
- Flipkart selling clothes
- Swiggy delivering food
- Netflix providing online streaming
- In all these cases, Business → Customer

2. B2B – Business to Business :-

B2B is a type of e-commerce where one business sells goods or services to another business.

- The final customer is not involved directly.
- The buying company usually uses the product for resale or business operations.

B2B (Business to Business) is a form of e-commerce in which transactions take place between two business organizations. In this type, products or services are sold in bulk quantities and usually involve high-value transactions. These dealings are based on long-term relationships, agreements, and negotiated prices.

3. C2C – Consumer to Consumer:-

C2C (Consumer to Consumer) is a type of e-commerce where one individual sells goods or services to another individual through an online platform. The platform acts as an intermediary to connect buyers and sellers. It is commonly used for selling second-hand or used products such as mobiles, bikes, furniture, and electronics.

Examples include OLX, Quikr, and Facebook Marketplace.

Example: Selling a Used Mobile

Ravi wants to sell his old mobile phone.

He posts an ad on OLX.

Suresh sees the ad and buys the phone.

-Ravi (Consumer) → Suresh (Consumer) = C2C OLX only provides the platform.

4. C2B – Consumer to Business:-

C2B (Consumer to Business) is a type of e-commerce where an individual (consumer) provides products or services to a company (business) and receive payment in return.

Example 1: Freelance Web Developer

A web developer builds a website for a company.

The company pays him for the service.

- Individual → Company = C2B

Example 2: Social Media Influencer

An Instagram influencer promotes a brand's product.

The company pays the influencer.

- Influencer → Brand = C2B

Popular C2B Platforms

Fiverr

Upwork

Freelancer.com

Shutterstock

5. B2G – Business to Government:-

B2G (Business to Government) is a type of e-commerce where a business sells goods or provides services to government organizations through online systems.

these transactions usually take place through online tenders and e-procurement systems.

Ex:-

IT companies developing government portals, construction companies building infrastructure, and suppliers providing medical equipment to public hospitals.

6. G2C – Government to Citizen:-

G2C (Government to Citizen) is a type of e-commerce where the government provides services directly to citizens through online platforms. It is an important part of e-governance.

Examples included online tax filling, electricity bill payment, passport applications, and Aadhaar services.

G2C reduces paperwork, saves time, and provides 24/7 access to public services. However, it requires internet connectivity and basic digital knowledge.

Feature	B2B	B2C	C2C	C2B
Full Form	Business to Business	Business to Consumer	Consumer to Consumer	Consumer to Business
Definition	Transactions between two businesses	Business sells products to end users	Individuals sell to other individuals	Individuals sell services/products to businesses
Nature of Orders	Bulk / Wholesale	Retail / Small quantity	Usually single items	Service or content based
Pricing	Negotiated prices	Fixed prices	Negotiable	Contract or bid-based
Decision Time	Longer (formal process)	Shorter (quick decision)	Depends on buyer	Based on agreement
Payment Mode	Bank transfer, credit terms	Online payment, cards, UPI	Online payment	Online transfer/contract payment
Example	IndiaMART	Flipkart	OLX	Fiverr

Infrastructure for E-Commerce:-

E-commerce infrastructure refers to the basic framework required to run an online business. It includes hardware, software, internet connectivity, payment systems, and security mechanisms. This infrastructure enables smooth online transactions between buyers and sellers. It also ensures secure data transfer and proper product delivery. Without proper infrastructure, e-commerce activities cannot function effectively.

Role of Internet in Supporting E-Commerce:-

The Internet plays a vital role in supporting e-commerce as it provides the platform through which online buying and selling take place. Without the internet, e-commerce cannot exist. It connects customers, businesses, banks, and service providers globally.

1. Global Connectivity :-The internet connects buyers and sellers worldwide. Businesses can reach customers across different countries without physical stores.

2. Online Communication:- It enables communication through emails, chat systems, video calls, and social media. This helps in customer support, marketing, and order updates.

3. Online Transactions:- The internet allows secure online payments through payment gateways like PayPal and Razorpay. It ensures fast and real-time transaction processing.

4. Information Sharing:- Customers can view product details, prices, reviews, and comparisons instantly. Businesses can update product information easily.

Examples: platforms like Amazon, Flipkart, and eBay function entirely through internet connectivity, serving millions of users daily.

Role of Intranet in E-Commerce :-

An **Intranet** is a private network used within an organization that uses internet technologies to share information securely among employees. In e-commerce, the intranet plays an important role in managing internal business operations efficiently.

1. Internal Communication:- Intranet helps employees communicate through internal emails, messages, and notices. It improves coordination between different departments like sales, accounts, and logistics.

2. Data Sharing :- Employees can access important documents such as product details, price lists, inventory reports, and customer information through the intranet.

3. Order and Inventory Management:- The intranet helps track orders, manage stock levels, and update product availability in real time.

4. Employee Collaboration:- Different departments (marketing, finance, warehouse) can work together efficiently by sharing updates and reports through the intranet.

5. Security and Control:- Since intranet is a private network, only authorized employees can access it. This protects confidential business data.

Role of Extranet in E-Commerce

An **Extranet** is a private network that allows a company to securely share information with external parties such as suppliers, distributors, business partners, and customers. It uses internet technology but provides controlled access to authorized outsiders.

In e-commerce, the extranet plays an important role in improving business coordination and supply chain management.

1. Supplier and Partner Collaboration:- Extranet allows suppliers and business partners to access product information, inventory status, and order details. This improves coordination and reduces delays.

2. Order Processing:- Suppliers can directly check purchase orders and update delivery status through the extranet system.

3. Supply Chain Management:- Extranet helps in managing the flow of goods from suppliers to warehouses and finally to customers efficiently.

4. Secure Data Sharing:- Sensitive business information such as pricing, contracts, and reports can be shared securely with authorized external users.

5. Customer Support Services:- Some companies provide customers with access to track orders, check account details, and download invoices through extranet portals.

6. Cost and Time Reduction:- Extranet reduces paperwork, speeds up communication, and lowers operational costs.

Basis	Internet	Intranet	Extranet
Definition	A global public network accessible to everyone.	A private network used within an organization.	A private network that allows limited access to external users.
Access	Open to all users worldwide.	Accessible only to employees of the organization.	Accessible to employees and authorized external partners.
Purpose	Used for communication, browsing, online shopping, etc.	Used for internal communication and data sharing.	Used for sharing information with suppliers, customers, and partners.
Security Level	Less secure (public access).	Highly secure (internal access only).	Secure but allows controlled external access.
Example	Online shopping websites, search engines.	Company internal portal.	Supplier or partner login portal.

Payment Gateways and Digital Wallets:-

In the modern digital world, online shopping and electronic transactions have become very common. E-Commerce depends heavily on secure and efficient online payment systems. To make online transactions safe, fast, and convenient, technologies like payment gateways and digital wallets are used.

Payment Gateway:-

A payment gateway is a technology that allows online businesses to accept payments from customers through debit cards, credit cards, UPI, net banking, and other digital payment methods.

It acts as a bridge between the customer, the merchant (seller), and the bank to securely process online payments.

Examples of Payment Gateways:-

Razorpay

Paytm Payment Gateway

Stripe

PayPal

Working Process:

1. The customer selects a product and enters payment details.
2. The payment gateway **encrypts the information** for security.
3. It sends the data to the merchant's bank (acquiring bank).
4. The bank contacts the customer's bank (issuing bank) for approval.
5. The transaction is either approved or declined, and the result is shown to the customer.

Digital Wallets

A **Digital Wallet** (also called an e-wallet) is an electronic application that allows users to **store money and make online or offline payments** using a mobile phone or computer.

It stores payment information like:

- Debit/Credit card details
- Bank account details
- Prepaid balance

◆ How Digital Wallet Works:

1. User installs a digital wallet app.
2. Links bank account or adds money to wallet.
3. During payment, selects wallet option.
4. Enters PIN/OTP to confirm transaction.
5. Money is transferred instantly.

Examples of Digital Wallets:

Paytm, Google Pay, PhonePe, PayPal

Importance in online Transactions:-

1. Security:- both payment gateways and digital wallets use encryption, reducing the risk of fraud.

2. Speed:- Transactions are processed instantly, improving customer satisfaction and merchant efficiency.

3. Global reach:- they support multiple currencies and international transactions for a global e-commerce.

4. Trust and Credibility:- secure payment systems increase consumer confidence in online shopping.

5. Multiple Payment Options;- Digital wallets support UPI, debit/credit cards, bank transfers, and wallet balance in one app.

6. Record of Transactions

They provide automatic transaction history, which helps users track expenses.

◆ Examples

Paytm, Google Pay, PhonePe

Legal and Ethical Issues in E-Commerce:-

E-commerce has created new opportunities for businesses and consumers, but it also brings several legal and ethical challenges. Online transactions involve cyber laws, data privacy, and intellectual property rights that must be properly managed. Businesses must follow legal regulations to prevent cybercrimes and protect customer information.

Legal Issues in E-Commerce:-

E-commerce involves online transactions, digital communication, and electronic contracts. Since business is conducted over the internet, several **legal issues** arise that must be properly addressed to ensure safe and lawful operations.

1. Cybercrime and Online Fraud

One of the major legal issues in e-commerce is cybercrime. This includes:

- Hacking
- Phishing
- Identity theft
- Credit card fraud

In India, the **Information Technology Act 2000** provides legal protection against cybercrimes and recognizes electronic transactions.

2. Data Protection and Privacy Laws

E-commerce companies collect personal and financial information from customers.

Legal issues include:

- Data breaches
- Unauthorized sharing of customer data
- Lack of consent

Companies must follow data protection regulations and maintain privacy policies.

3. Intellectual Property Rights (IPR)

Intellectual Property means legal ownership of creative ideas and works. It protects creators and businesses from copying and misuse.

Online businesses may face legal issues related to:

- Copyright infringement
- Trademark misuse
- Selling counterfeit products
- Software piracy

Businesses must respect intellectual property laws to avoid lawsuits. If someone copies your website content or sells products using your brand name without permission, it is a violation of intellectual property rights.

4. Consumer Protection Laws

Customers have legal rights in online shopping, such as:

- Right to accurate product information
- Right to refund and return
- Protection against misleading advertisements

Failure to follow consumer protection laws can result in penalties.

Ethical Issues in E-Commerce:-

Ethical issues in e-commerce refer to the moral principles and standards that businesses must follow while conducting online transactions. Even if something is

legally allowed, it may still be unethical. Ethical practices help build customer trust and maintain a good reputation.

1. Privacy of Customer Information

E-commerce websites collect personal data such as:

- Name and address
- Phone number
- Bank and card details

Ethically, businesses must:

- Protect customer data
- Not sell or misuse personal information
- Take proper consent before collecting data

2. Security of Online Transactions

Companies must ensure secure payment systems.

Failing to provide proper security may lead to fraud and financial loss for customers.

Ethical responsibility includes:

- Using encryption
- Secure payment gateways
- Protecting customer accounts

3. Honest Advertising

Businesses should:

- Provide accurate product descriptions
- Avoid false claims
- Show real product images

Misleading advertisements and fake discounts are unethical practices.

4 Fair Return and Refund Policies

Companies should provide:

- Clear return policies
- Quick refunds

- Proper customer support

Unfair return rules damage customer trust.

5. Fake Reviews and Ratings

Some businesses post fake positive reviews or remove negative feedback.

This is unethical because it misleads customers.

Conclusion:-

Legal and ethical issues are very important in e-commerce because business transactions take place online and involve sensitive customer information. Legal regulations such as cyber laws, data protection laws, and intellectual property rights help prevent fraud, misuse of data, and online crimes. At the same time, ethical practices like honesty, transparency, fairness, and respect for customer privacy build trust and long-term relationships.

Therefore, for successful and sustainable e-commerce operations, businesses must strictly follow both legal requirements and ethical standards in the digital marketplace.

E-Commerce Business Models – Revenue Models:-

E-commerce business models explain how online businesses operate and generate income. A **revenue model** describes the method by which a company earns money through its website or digital platform. Different e-commerce companies use different revenue models depending on their services and target customers.

1. Advertising Revenue Model

In this model, a company earns money by displaying advertisements on its website or app. Businesses pay to show their ads to users.

How it Works:

- Website attracts large number of visitors.
- Advertisers pay to display ads.
- Revenue is generated through clicks (PPC) or views (CPM).

Example:

Google earns revenue through online advertisements.

Advantages:

- Free access for users
- High earning potential with large traffic

2. Subscription Revenue Model

In this model, users pay a fixed amount regularly (monthly/yearly) to access services or content.

How it Works:

- Customers subscribe to premium content or services.
- Payment is collected periodically.

Example:

Netflix charges monthly subscription fees.

Advantages:

- Regular and predictable income
- Customer loyalty

3. Transaction Fee Revenue Model

The company charges a fee for each transaction made through its platform.

How it Works:

- Platform connects buyers and sellers.
- Charges commission on every sale.

Example:

PayPal charges transaction fees for payment processing.

Advantages:

- Income increases with more transactions
- No need to own products

4. Sales Revenue Model

The company earns money by directly selling products or services online.

How it Works:

- Customers purchase products.

- Company earns profit from product sales.

Example:

Amazon sells products directly to customers.

Advantages:

- Direct profit from sales
- Full control over pricing

5. Affiliate Revenue Model

In this model, a company earns commission by promoting other companies' products.

How it Works:

- Website shares affiliate links.
- Earns commission when users purchase through the link.

Example:

Flipkart runs affiliate programs.

Advantages:

- No need to maintain inventory
- Low investment

Conclusion

E-commerce revenue models such as advertising, subscription, transaction fee, sales, and affiliate models help businesses generate income online. Choosing the right model depends on the type of business, target audience, and services offered. Many successful companies combine multiple revenue models to increase profitability and sustainability.

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