# Unit 1 (Introduction)

World Wide Web

1. The World Wide Web (WWW), often called the Web, is a system of interconnected webpages and information that you can access using the Internet.
2. It was created to help people share and find information easily, using links that connect different pages together.
3. The Web allows us to browse websites, watch videos, shop online, and connect with others around the world through our computers and phones.
4. All public websites or web pages that people may access on their local computers and other devices through the internet are collectively known as the World Wide Web or W3.
5. Users can get further information by navigating to links interconnecting these pages and documents.
6. This data may be presented in text, picture, audio, or video formats on the internet.

Client-server architecture

1. Client-server architecture in the Internet involves two primary entities: clients and servers.

2. Clients are end-user devices like computers or smartphones that request services or resources.

3. Servers are powerful computers that provide these services, hosting applications, databases, or websites.

4. When a client requests data (e.g., a webpage), the server processes this request and sends back the appropriate response.

5. This architecture relies on standardized protocols such as HTTP/HTTPS for web services and TCP/IP for data transmission.

6. It allows for centralized management of resources, improved security, and scalability.

7. Clients remain relatively lightweight, while servers handle heavy processing and data storage, enabling efficient and organized resource distribution across the network.

8. Clients are prone to viruses, Trojans, and worms if present in the Server or uploaded into the Server.

9. Servers are prone to Denial of Service (DOS) attacks.

Request

Phne

PC-P

Lapto
PT

Server-PT
Server

Network

Response
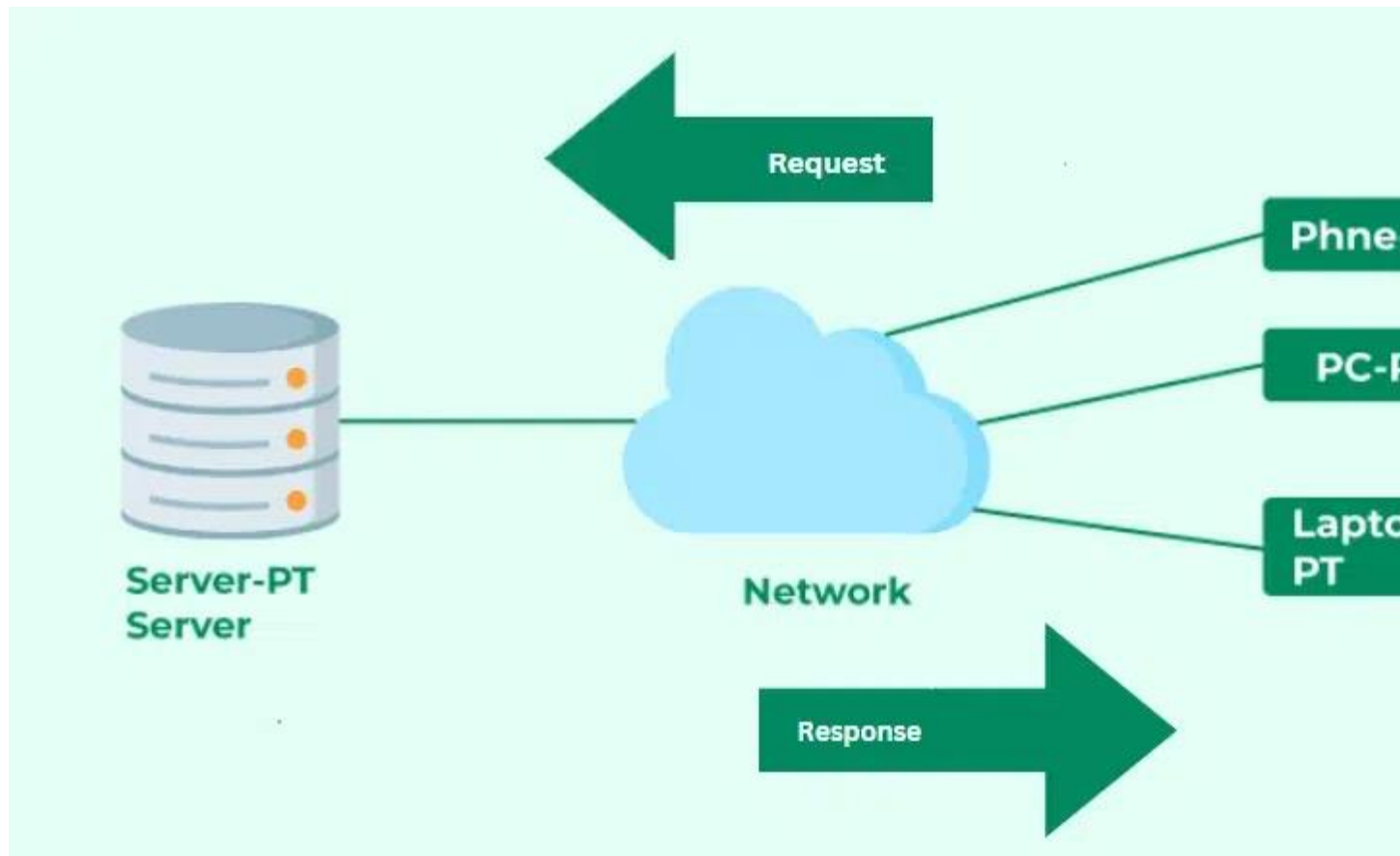
Client-Server Applications

1. Web Browsers and Web Servers: When you type a URL in a browser (like Chrome or Firefox), it acts as the client requesting web pages from a web server (like Apache or Nginx). The server then delivers the requested page to the browser.

2. Email Clients and Email Servers: Email applications (like Outlook or Gmail's app) act as clients, connecting to email servers (like Microsoft Exchange or Gmail's servers) to send, receive, and store emails.

3. Online Games: Many multiplayer games (like Fortnite, Call of Duty) use client-server architecture. The game application on players' devices acts as the client, connecting to a game server that manages the game environment, player interactions, and updates.

4. Banking Apps and Servers: Mobile banking apps on your phone connect to a bank's servers to check balances, transfer money, and perform other transactions. The app acts as the client, while the bank's system acts as the server.

5. File Storage and Sharing Services: Cloud storage services (like Google Drive, Dropbox) have client apps that let users upload, download, and manage files, while the files are stored on servers that provide secure access and storage.

Communication switching

1. Communication switching, also known as switching techniques, is a process that connects devices and allows them to exchange information and communicate in computer networks and telecommunications.

2. Switching can improve network efficiency by allowing multiple devices to share a communication channel, routing data to its destination, and providing error checking and correction.

3. There are different types of switching techniques, including:

- Circuit switching: Establishes a dedicated physical path through the network.
- Packet switching: Splits messages into multiple packets that travel independently over different circuits to their destination. The ARPANET was an example of a packet switching network.
- Message switching: Also known as "store and forward" networks, each message is stored before being transmitted to the next switch. Email is a common application for message switching.

ISP

1. An ISP (internet service provider) is a company that provides individuals and organizations access to the internet and other related services.

2. An ISP has the equipment and the telecommunication line access required to have a point of presence on the internet for the geographic area served.

3. ISPs make it possible for customers to access the internet while also providing additional services such as email, domain registration and web hosting.

4. ISPs may also provide different internet connection types, such as cable and fiber.

5. ISPs are grouped into the following three tiers:

- Tier 1 ISPs: These ISPs have the most global reach and own enough physical network lines to carry most traffic on their own.Tier 1 ISPs typically sell network access to tier 2 ISPs.
- Tier 2 ISPs. These ISPs have regional or national reach and are service providers that connect tier 1 and tier 3 ISPs. Tier 2 networks focus on consumer and commercial customers.
- Tier 3 ISPs. These ISPs connect customers to the internet using another ISP's network. They focus on providing internet access to local businesses and consumer markets.

B2C Model

1. The Business-to-Consumer (B2C) model involves businesses selling products or services directly to individual consumers.

2. This model encompasses a wide range of industries, including retail, entertainment, and hospitality.

3. In B2C transactions, companies market their offerings through various channels such as online stores, brick-and-mortar shops, and mobile applications.

4. E-commerce is a significant aspect of B2C, allowing consumers to browse, purchase, and receive products with ease.

5. B2C marketing strategies often leverage digital tools, including social media, email campaigns, and search engine optimization, to reach and engage target audiences.

6. This model emphasizes understanding consumer behavior, preferences, and trends to drive sales and foster customer loyalty.

7. Key examples of B2C companies include Amazon, Netflix, and Starbucks, which utilize both online and offline channels to deliver their products and services directly to consumers.

B2B Model

1. The Business-to-Business (B2B) model involves transactions between businesses, where companies sell products or services to other companies rather than individual consumers.

2. This model typically features larger transaction volumes and longer sales cycles compared to B2C.

3. B2B companies often provide raw materials, components, or specialized services that other businesses need to produce goods, operate, or deliver their own services.

4. B2B Involves multiple decision-makers, customized solutions, and longer negotiation periods.

5. It Emphasizes building and maintaining long-term relationships through personalized service and support.

6. B2B Deals often involve larger sums of money and longer-term contracts

7. Examples of B2B companies include IBM, which provides technology solutions to businesses, and Salesforce, which offers customer relationship management (CRM) software.

C2C Model

1. The Consumer-to-Consumer (C2C) model involves transactions between individuals, where consumers sell products or services directly to other consumers.

2. This model has grown significantly with the advent of online marketplaces and platforms that facilitate peer-to-peer exchanges.

3. Platforms like eBay and OLX provide the infrastructure for consumers to list, sell, and buy items.

4. Trust and credibility are built through user-generated reviews and ratings, helping buyers make informed decisions.

5. C2C platforms offer a wide variety of products, often including unique, handmade, or second-hand items not typically found in traditional retail stores.

6. Sellers can operate without the significant overhead costs associated with running a business, making it accessible for individuals to participate.

7. This model enables consumers to monetize their goods and services efficiently while offering buyers a broad range of choices.

C2B Model

1. The Consumer-to-Business (C2B) model involves individual consumers providing products or services to businesses.

2. This model is characterized by consumers creating value that businesses buy or utilize.

3. Individuals offer their skills and expertise to businesses through platforms like Upwork and Fiverr.

4. Companies gather ideas, feedback, or solutions from a large group of consumers, often through online platforms.

5. Individuals with a substantial social media following promote products or services to their audience, and businesses pay for this exposure.

6. The C2B model benefits businesses by providing access to a diverse talent pool, innovative ideas, and targeted marketing opportunities.

7. Consumers gain by monetizing their skills, knowledge, and influence, often working flexibly and on their terms.

8. This model leverages the power of individual creativity and expertise to create value for businesses.

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brokerage model

1. The brokerage model involves intermediaries that facilitate transactions between buyers and sellers, earning a commission or fee for their services.

2. Brokers create a platform or marketplace where transactions can occur, adding value by bringing parties together, providing information, and sometimes offering additional services like payment processing or dispute resolution.

3. Key features of the brokerage model include:

- Matchmaking: Brokers connect buyers with suitable sellers, enhancing the efficiency and effectiveness of the transaction process.
- Fee-Based Revenue: Brokers earn money through fees or commissions charged for each transaction, listing, or service provided.
- Marketplaces and Platforms: Online platforms like eBay, Airbnb, and Uber exemplify the brokerage model by facilitating peer-to-peer sales, rentals, or services.
- Trust and Security: Brokers often provide mechanisms for building trust, such as user reviews, ratings, and secure payment systems.

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aggregator model

1. The aggregator model involves a business that collects information on products or services from various providers, then consolidates this information into a single platform.
2. Aggregators present consumers with a comprehensive, easy-to-navigate comparison of options, allowing for informed decision-making.
3. Aggregators bring together multiple providers to offer a wide range of choices in one place, simplifying the search process for consumers.
4. Aggregators typically earn money through affiliate marketing, commissions, advertising, or lead generation fees from the businesses they feature.
5. Aggregators often provide additional tools, such as filters, reviews, and ratings, to help consumers make better choices.
6. Travel Websites like Expedia and BookingMyShow aggregate movies, hotel, and car rental options.
7. E-commerce Platforms like Amazon act as aggregators for a wide range of products from various sellers.
8. Food Delivery Services like Zomato and Swiggy consolidate menu options from numerous restaurants.

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community model

1. The community model refers to a framework where individuals with shared interests, goals, or identities come together to interact, collaborate, and support each other within a specific context.

2.Communities can form around various factors such as geographic location, hobbies, professions, or shared beliefs.

3. Key characteristics of a community model include mutual support, shared resources, and collective identity.

4. In the digital age, communities often exist online, facilitated by platforms like social media, forums, or specialized websites.

5. These platforms enable members to connect globally, transcending physical boundaries.

6. Within these communities, members typically engage in discussions, share knowledge and experiences, and provide emotional or practical support.

7. An example of a community model is the Reddit platform. Reddit hosts thousands of communities called "subreddits," each focused on a specific topic or interest, such as technology, cooking, or fitness. Within these subreddits, members share news, ask questions and engage in discussions.

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subscription model

1. The subscription model is a business strategy where customers pay a recurring fee at regular intervals (such as monthly or annually) to access a product or service.

2. This model has become increasingly popular across various industries due to its benefits for both businesses and customers.

3. Businesses can forecast their revenue more accurately with subscriptions, providing a steady income stream.

4. Subscribers often develop long-term relationships with the business, leading to higher customer retention rates compared to one-time purchases.

5. Subscribers receive ongoing updates, new features, and improvements, ensuring they always have access to the latest offerings.

6. Examples of successful subscription-based businesses include streaming services like Netflix and Spotify, software companies offering SaaS products like Adobe.

Broadband technologies

Broadband technologies refer to various methods of transmitting high-speed internet and data services over telecommunications networks.

Here are some common broadband technologies:

1. **Digital Subscriber Line (DSL):** DSL uses existing telephone lines to provide high-speed internet access. It operates simultaneously with voice services and offers different speeds depending on the distance from the provider's central office.
2. **Cable Modem:** Cable internet uses the same coaxial cable that delivers cable television signals. It provides higher speeds than DSL and is widely available in urban and suburban areas.
3. **Fiber Optic:** Fiber optic broadband uses light pulses to transmit data through thin, flexible glass fibers. It offers the highest speeds and reliability but requires significant infrastructure investment.
4. **Wireless Broadband:** Wireless broadband utilizes radio signals to deliver internet access, often through cellular networks (4G, 5G) or fixed wireless technologies.
5. **Satellite:** Satellite broadband uses satellites in geostationary orbit to deliver internet access to remote or rural areas where other broadband options may be unavailable.

IT Act 2000

1. The Information Technology Act, 2000 (IT Act 2000) is an important legislation in India that addresses various aspects of electronic commerce and electronic governance.
2. The IT Act was enacted to provide legal recognition for electronic transactions, facilitate electronic filing of documents with government agencies, and promote electronic governance.
3. It establishes legal frameworks for electronic contracts, digital signatures, and electronic records, ensuring their validity and enforceability in electronic transactions.
4. The Act addresses various cyber crimes such as hacking, identity theft, and data breaches.
5. It defines offenses related to computer systems, data protection, and privacy, specifying penalties and punishments for violations.
6. Over time, amendments have been made to the IT Act, such as the IT (Amendment) Act, 2008, which introduced provisions related to data protection and privacy.

History of E-commerce

1. Emergence (1990s - Early 2000s):

- In the early 1990s, e-commerce in India was primarily restricted to B2B transactions and limited consumer adoption due to technological and infrastructural constraints.
- With the liberalization of the Indian economy and the growth of internet penetration in the late 1990s, e-commerce platforms started to emerge, focusing initially on online ticketing and travel bookings.

2. Early Growth (Mid-2000s - 2010s):

- The mid-2000s witnessed the rise of online marketplaces like eBay India, Flipkart and Snapdeal.
- Payment Gateways: The development of secure payment gateways and digital payment options helped boost consumer confidence in online transactions.

3. Rapid Expansion (2010s - Present):

- The proliferation of affordable smartphones and cheaper data plans around 2010-2012 spurred a significant increase in internet users and online shoppers, particularly from tier 2 and tier 3 cities.
- E-commerce platforms expanded their product offerings beyond electronics and books to include fashion, groceries, and more.
- Major players like Amazon entered the Indian market (2013), intensifying competition and driving innovation.

4. Current Landscape:

- E-commerce has evolved into an omni channel experience, integrating online and offline retail channels to enhance customer engagement and fulfillment options.
- Emerging Trends: AI-driven personalized recommendations, social commerce, and sustainability initiatives are shaping the future of e-commerce in India.

Advantages of E-commerce

1. Global Reach: E-commerce allows businesses to reach a global audience without the limitations of geographical location, opening up new market opportunities.

2. Convenience: Consumers can shop anytime, anywhere, and from any device, offering unparalleled convenience and accessibility.

3. Lower Costs: E-commerce often reduces overhead costs associated with physical stores, such as rent, utilities, and staffing.

4. Wide Product Selection: Online stores can offer a broader range of products and services compared to brick-and-mortar stores, catering to diverse customer preferences.

5. Personalization: E-commerce platforms can use data analytics to personalize the shopping experience, offering targeted recommendations and promotions based on customer behavior.

6. 24/7 Availability: Online stores operate round-the-clock, allowing customers to shop at their convenience, irrespective of time zones or holidays.

Disadvantages of E-commerce

1. Lack of Personal Interaction: Online shopping lacks the personal touch and immediate customer service that physical stores can provide.

2. Shipping Costs and Delays: Shipping costs can add to the overall expense, and delivery delays or issues may impact customer satisfaction.

3. Security Concerns: Cybersecurity threats such as data breaches and fraud pose risks to both businesses and consumers, requiring robust security measures.

4. Dependency on Technology: E-commerce relies heavily on technology and infrastructure like internet connectivity and reliable servers. Technical issues can disrupt operations.

5. Return and Exchange Challenges: Returning or exchanging products can be more cumbersome and costly compared to physical stores, especially for large items.

6. Market Saturation and Competition: The ease of entry into e-commerce can lead to market saturation and intense competition, making it challenging for new businesses to stand out.

Unit 2 (Marketing)

Traditional marketing

Traditional marketing refers to the conventional methods businesses use to promote their products and services. These methods have been around for decades and often rely on offline channels to reach consumers. Here are some common forms of traditional marketing:

1. **Print Advertising**: Ads in newspapers, magazines, brochures, and flyers.
2. **Broadcast Advertising**: TV and radio commercials.
3. **Direct Mail**: Sending promotional materials directly to people's homes or businesses.
4. **Telemarketing**: Using the phone to reach potential customers.
5. **Outdoor Advertising**: Billboards, posters, and transit ads (buses, taxis, subways).
6. **Events and Trade Shows**: Participating in or sponsoring events, trade shows, and conferences.
7. **Referral Marketing**: Encouraging existing customers to refer new customers through word-of-mouth.

Achieving Web Presence Goals

Achieving web presence goals involves creating and maintaining a strong and effective online presence. This can be achieved through several strategies:

1. Define Clear Goals:

- Increase visibility and recognition of your brand.
- Attract potential customers and gather their contact information.
- Drive online purchases or conversions.

2. Develop a Professional Website:

- Ensure your website is easy to navigate and visually appealing.
- Make sure your website works well on mobile devices.
- Optimize your website for search engines to improve your ranking and visibility.

3. Social Media Presence

- Choose the social media platforms that best suit your target audience.
- Regularly post updates, promotions, and engaging content.
- Interact with your followers by responding to comments and messages.

4. Analytics and Monitoring

- Use tools like Google Analytics to track your website's performance.
- Continuously analyze data and adjust your strategies based on what works and what doesn't.

5. Email Marketing

- Build and maintain an email list of your customers and prospects.
- Send regular updates, promotions, and valuable content to your subscribers.

# Metrics Defining Internet Units of Measurement

1. DIRECT METRICS

- Number of individual, authenticated user sessions.
- Authenticated user sessions by location.
- Authenticated user profiles by region.
- Top 'entry' and 'exit' pages by authenticated users.
- Most-downloaded files.
- Most-active, authenticated organizations accessing the site.
- Most-active countries, states, cities, and regions by authenticated users.
- Organizational breakdown of site access by authenticated users.
- Maximal, minimal, average number of authenticated users per period. Most-used browsers.

INDIRECT METRICS

- Number of hits per page.
- Number of successful hits per page.
- Number of hits for total site.
- Number of hits per page, per session, per individual user.
- Average user session time in seconds.
- Most-accessed segments.
- Top paths through site.
- Views of banners.
- Hits by user groups.
- Total hits.
- Cached hits.
- Successful hits.
- Failed hits.

Browser Behaviour Model Graph (BBMG)
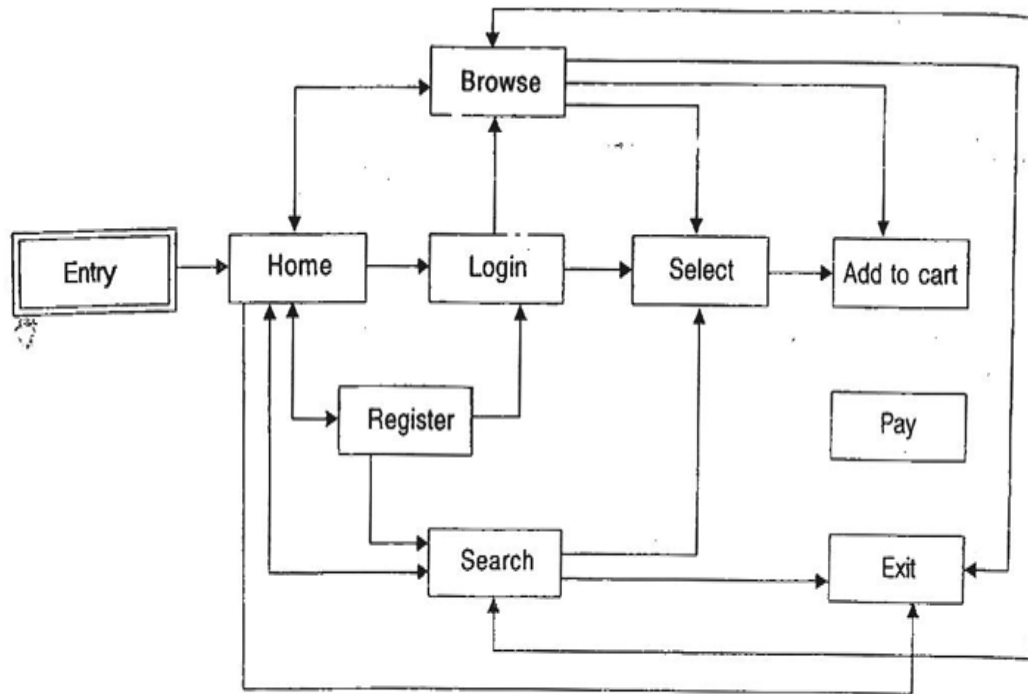
transitions of the BBMG for the virtual videostore.

1. Entry:

This is a special state that immediately precedes a customer's entry to the online store.

2. Home :

This is the state a customer is in, after selecting the URL for the site's home page.

3. Login:

A customer moves to this state after requesting a login to the site.

4. Register :

To have an account created by registering with the online video store, the

customer selects the proper link for the registration page, thus making a transition to the Register state.

5. Search :

A customer goes to this section after issuing a search request.

6. Browse:

This is the state reached after a customer selects one of the links available at the site to view any of the pages of the site. These links include the list of bestsellers and weekly promotions.

7. Select:

A search returns a list of zero or more links to videos. By selecting one of these links, à customer moves to this state.

8. Add to Cart:

A customer moves to this state upon selecting the button that adds a selected video to the shopping cart.

9. Pay (Billing):

When ready to pay for the items in the shopping cart, the customer moves to the Billing section.

10. Exit:

Customers may leave the site from any state. Thus, there is a transition from all states, except the entry state, to the exit state.

Online marketing

1. Online marketing, also known as digital marketing, is the practice of using the internet and other digital communication channels to promote a brand, product, or service to potential customers.

2. The goal is to connect with customers and create awareness of the brand.

3. Online marketing typically involves: Identifying the target audience, Developing a plan, Producing content, Distributing content, and Monitoring performance.

4. Creating and sharing relevant content to build relationships with the audience and earn their trust.

5. This can include blog posts, videos, podcasts, infographics, or webinars.

6. Making a website and its content relevant to the audience's searches, optimizing technical performance, and building digital trust.

7. Using social media platforms to interact with customers, increase sales, and drive website traffic.

Various Means of Advertising

1. Television: Reaches a wide audience with visual and audio impact.

2. Radio: Targets local audiences with audio messages.

3. Print Media**:** Includes newspapers, magazines, and brochures for detailed information.

4. Online Advertising:

- **Search Engine Ads:** Appear in search results.
- **Display Ads:** Banner ads on websites.
- **Social Media Ads:** Targeted ads on platforms like Facebook and Instagram.
- **Video Ads:** YouTube and other video platforms.

5. Outdoor Advertising:

- **Billboards:** Large, eye-catching displays in high-traffic areas.
- **Transit Ads:** On buses, trains, and taxis.

6. Direct Mail: Physical mailers sent to a targeted list.
7. Email Marketing: Direct emails to customers and prospects.
8. Influencer Marketing: Collaborations with influencers to promote products.

Data Mining and Market Research

1. Data mining involves extracting useful patterns and knowledge from large sets of data, using techniques such as clustering, classification, and association rule learning.

2. In marketing research, data mining is pivotal for understanding consumer behavior, segmenting markets, and predicting trends.

3. By analyzing data from various sources like sales transactions, social media, and customer feedback, businesses can identify purchasing patterns, customer preferences, and potential market opportunities.

4. This enables targeted marketing strategies, personalized customer experiences, and optimized product placements.

5. Ultimately, data mining enhances the ability to make data-driven decisions, improve customer satisfaction, and increase competitive advantage in the marketplace.

6. Data mining helps marketers to fine-tune their advertising campaigns.

7. By analyzing past campaign data, businesses can identify which strategies yielded the highest ROI and adjust future campaigns to maximize effectiveness and reduce costs.

Difference between E-CRM and CRM

Dimensions	Technology-enabled relationship management (E-CRM)	Traditional relationships with customers (CRM)
Advertising	Provide information in response to specific customer inquiries	"Push and sell" a uniform message to all customers
Targeting	Identifying and responding to specific customer behaviors and preferences.	Market segmentation
Promotions anddiscounts offered	Individually tailored to customer	Same for all customers
Distribution channels	Direct or through intermediaries; customer's choice	Through intermediaries chosen by the seller
Pricing of products or services	Negotiated with each customer	Set by the seller for all customers
New product	Created in response to customer	Determined by the seller

features	demands	based on research and development
Measurements used to manage the customer relationship	Customer retention: total value of the individual customer relationship	Market share: profit

advertising-supported model

1. An advertising-supported model, also known as an ad-supported model, is a business strategy where a company offers a product or service to users for free or at a reduced cost, with revenue generated primarily through advertising.
2. This model is prevalent in various industries, particularly in digital platforms and media, where content or services are made accessible to a wide audience without direct charges to users.
3. Users can access content, services, or products without paying upfront costs.
4. This lowers barriers to entry and attracts a larger user base.
5. Companies collect user data (with consent) to deliver targeted advertisements based on demographics, interests, and behavior.
6. This improves ad relevance and effectiveness.
7. Advertisers pay the platform or service provider to display ads to their user base.
8. Revenue is typically generated based on metrics like impressions (views), clicks, or conversions.

Marketing Stratergies

1. Search Engine Optimization (SEO):

- SEO involves optimizing a website to rank higher in search engine results pages (SERPs) for relevant keywords.
- This strategy focuses on improving organic (non-paid) visibility, driving traffic, and enhancing credibility.

2. Content Marketing:

- Content marketing involves creating and distributing valuable, relevant, and consistent content to attract and retain a targeted audience.
- This content can include blog posts, articles, videos, infographics, and more, aiming to educate, entertain, or solve problems for users.

3. Social Media Marketing:

- Utilizing social media platforms (e.g., Facebook, Instagram, Twitter, LinkedIn) to connect with audiences, build brand awareness, and drive engagement.

4. Pay-Per-Click (PPC) Advertising:

- PPC advertising involves paying for ad placements on search engines (Google Ads), social media platforms (Facebook Ads), and other websites.
- Advertisers pay each time a user clicks on their ad, driving immediate traffic to their websites or landing pages.

5. Influencer Marketing:

- Collaborating with influencers (individuals with a large and engaged following) to endorse products or services.
- Influencer marketing leverages the trust and authority of influencers to reach their audience and drive brand awareness and sales.

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elements of branding

1. Brand Identity: This includes the visual elements that represent the brand, such as logo, colors, typography, and design style. Consistency across these elements helps in creating brand recognition and recall.

2. Brand Personality: Brands often have distinct personalities that resonate with their target audience. This can be conveyed through the tone of voice, style of communication, and overall brand behavior.

3. Brand Values: These are the principles and beliefs that guide the brand's actions and decisions. Brand values reflect what the brand stands for and its commitment to customers, employees, and society.

4. Brand Promise: This is the commitment a brand makes to deliver a consistent experience and value to its customers. It encapsulates what customers can expect from the brand and sets expectations for interactions.

5. Brand Story: A compelling brand story connects emotionally with customers, illustrating the brand's journey, mission, and impact. It helps build authenticity and forge deeper connections with the audience.

Unit 3 (Security)

Security on Internet

Internet security involves protecting users and systems from cyber threats such as viruses, malware, and hacking. It encompasses several key areas:

1. Encryption: Encrypts data to ensure privacy and integrity during transmission.
2. Authentication: Verifies the identity of users and devices to prevent unauthorized access.
3. Firewalls and Antivirus Software: Blocks malicious traffic and detects harmful software.
4. Secure Protocols: Uses HTTPS, SSL/TLS to secure communication channels.
5. User Awareness: Educates users on safe practices, like recognizing phishing scams and using strong passwords.
6. Regular Updates: Keeps systems and software updated to protect against known vulnerabilities.
7. Access Controls: Limits user permissions based on roles to minimize the risk of internal threats.

Together, these measures help safeguard personal information, financial data, and intellectual property against cyberattacks, ensuring a safer online environment.

Security for Email

1. Use Strong Passwords: Create complex passwords and change them regularly.
2. Enable Two-Factor Authentication (2FA): Adds an extra layer of security by requiring a second form of verification.
3. Encrypt Emails: Use end-to-end encryption tools like PGP (Pretty Good Privacy) to secure email content.
4. Spam Filters: Implement advanced spam filters to block phishing attempts and malicious emails.
5. Regular Updates: Keep email clients and servers updated to patch vulnerabilities.

6. User Training: Educate users on recognizing phishing emails and safe email practices.

Security for Website

1. Use HTTPS: Secure data in transit with SSL/TLS certificates.
2. Regular Updates: Keep web applications, plugins, and servers up-to-date to avoid exploits.
3. Web Application Firewall (WAF): Protects against common web threats like SQL injection and cross-site scripting (XSS).
4. Strong Authentication: Implement strong user authentication and enforce strong password policies.
5. Regular Backups: Perform regular backups of website data to recover from potential breaches or data loss.
6. Monitor and Scan: Regularly monitor for suspicious activity and scan for vulnerabilities.

Vulnerabilities of a website

1. SQL Injection:

- **Description:** Attackers inject malicious SQL queries into input fields to manipulate the database.
- **Impact:** Can lead to unauthorized data access, data corruption, and database manipulation.
- **Mitigation:** Use parameterized queries and ORM frameworks, and validate input data.

2. Cross-Site Scripting (XSS):

- **Description:** Attackers inject malicious scripts into webpages viewed by other users.
- **Impact:** Can lead to data theft, session hijacking, and defacement of websites.

- **Mitigation:** Sanitize and validate all user inputs, use Content Security Policy (CSP), and encode output data.

3. Cross-Site Request Forgery (CSRF):

- **Description:** Attackers trick users into executing unwanted actions on a website they are authenticated on.
- **Impact:** Can result in unauthorized actions being performed, such as fund transfers or account changes.
- **Mitigation:** Use anti-CSRF tokens, ensure critical actions require re-authentication, and check referer headers.

4. Broken Authentication and Session Management:

- **Description:** Weaknesses in authentication mechanisms and session handling can be exploited.
- **Impact:** Can lead to unauthorized access and session hijacking.
- **Mitigation:** Implement strong password policies, use secure session management practices, and employ multi-factor authentication.

5. Security Misconfiguration:

- **Description:** Improper configuration of security settings in applications and servers.
- **Impact:** Can expose sensitive data and services to unauthorized access.
- **Mitigation:** Regularly update and patch systems, perform security audits, and follow security best practices for configurations.

Firewall

1. Firewall match the network traffic against the rule set defined in its table.

2. Once the rule is matched, associate action is applied to the network traffic.

3. For example, Rules are defined as any employee from Human Resources department cannot access the data from code server and at the same time another rule

is defined like system administrator can access the data from both Human Resource and technical department.

4. Rules can be defined on the firewall based on the necessity and security policies of the organization.

5. From the perspective of a server, network traffic can be either outgoing or incoming.

6. Most traffic which reaches on the firewall is one of these three major Transport Layer protocols- TCP, UDP or ICMP.

Components of a firewall

1. Packet Filter: Analyzes network packets, filtering them based on source and destination IP addresses, port numbers, and protocols.

2. Access Control Lists (ACLs): Sets of rules that determine whether to permit or deny traffic based on packet attributes.

3. Proxy Server: Intermediates requests between clients and servers, providing additional security by hiding the internal network structure.

4. Application Gateway: Filters traffic at the application layer, inspecting data payloads for malicious content.

5. State Table: Tracks the state of active connections, allowing the firewall to make more informed decisions about which packets to allow or deny based on the context of the traffic.

6. NAT Table: Maps internal private IP addresses to external public IP addresses, helping to conserve IP addresses and add a layer of security by hiding internal network details.

7. Intrusion Detection System (IDS): Monitors network traffic for suspicious activity and alerts administrators.

8. Intrusion Prevention System (IPS): Actively blocks or prevents detected threats in real-time.

Advantages of firewall

1. **Protection From Unauthorized Access:** Firewalls can be set up to restrict incoming traffic from particular *IP addresses/* or networks, preventing hackers or other malicious actors from easily accessing a network or system. Protection from unwanted access.
2. **Prevention of Malware and Other Threats:** *Malware /*and other threat prevention: Firewalls can be set up to block traffic linked to known malware or other security concerns, assisting in the defense against these kinds of attacks.
3. **Control of Network Access:** By limiting access to specified individuals or groups for particular servers or applications, firewalls can be used to restrict access to particular network resources or services.
4. **Monitoring of Network Activity:** Firewalls can be set up to record and keep track of all network activity.
5. **Regulation Compliance:** Many industries are bound by rules that demand the usage of firewalls or other security measures.
6. **Network Segmentation:** By using firewalls to split up a bigger network into smaller subnets, the attack surface is reduced and the security level is raised.

Security issues in E-commerce

1. **Credit Card Fraud:** Unauthorized use of credit card information for transactions.
2. **Chargebacks:** Disputes initiated by customers claiming unauthorized transactions, leading to potential financial losses for merchants.
3. **Customer Data Theft:** Unauthorized access to customer information, including personal and financial data.
4. **Company Data Exposure:** Compromised business-sensitive information, such as trade secrets and financial records.
5. **Fake Websites:** Cybercriminals create fraudulent websites that mimic legitimate e-commerce sites to steal customer credentials and financial information.
6. **Email Phishing:** Malicious emails designed to trick recipients into providing sensitive information or clicking on malicious links.
7. **DoS/DDoS Attacks:** Overwhelm an e-commerce site with traffic, causing it to crash and become unavailable to legitimate users.

8. **Man-in-the-Middle (MitM) Attack:** Attackers intercept and potentially alter communication between the customer and the e-commerce site, stealing sensitive information.
9. **Social Engineering:** Attackers manipulate individuals into divulging confidential information or performing actions that compromise security

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Types of password security

1. Simple Passwords:

- **Description**: Users create a password that is used to authenticate their identity.
- **Advantages**: Easy to implement and use.
- **Disadvantages**: Susceptible to brute force attacks, dictionary attacks, and social engineering. Users often choose weak passwords.

2. Hashed Passwords:

- **Description**: Passwords are hashed using cryptographic hash functions before storing them on the server.
- **Advantages**: Increases security by ensuring that passwords are not stored in plaintext.
- **Disadvantages**: If the hash function used is weak or if the hashed passwords are not salted, attackers can use rainbow tables to crack them.

3. Salted Passwords:

- **Description**: A unique random value (salt) is added to the password before hashing.
- **Advantages**: Protects against rainbow table attacks and ensures that even identical passwords result in different hashes.
- **Disadvantages**: Adds complexity to the password management system.

4. Multi-Factor Authentication (MFA):

- **Description:** Requires users to provide two or more forms of identification (e.g., password and a code sent to their phone).
- **Advantages:** Significantly enhances security by combining multiple authentication factors.
- **Disadvantages:** Can be inconvenient for users and requires additional infrastructure.

5. Password Managers:

- **Description:** Software that helps users generate and store complex passwords securely.
- **Advantages:** Encourages the use of strong, unique passwords for each service.
- **Disadvantages:** If the password manager itself is compromised, all stored passwords are at risk.

Types of biometric authentication

1. Fingerprint Recognition:

- **Description:** Uses the unique patterns of a person's fingerprint for authentication.
- **Advantages:** High accuracy and convenience; difficult to replicate.
- **Disadvantages:** Can be affected by injuries or changes in the fingerprint. Requires specialized hardware.

2. Facial Recognition:

- **Description:** Uses the unique features of a person's face for authentication.
- **Advantages:** Non-intrusive and easy to use.
- **Disadvantages:** Can be affected by lighting conditions, facial changes, and may have privacy concerns.

3. Iris Recognition:

- **Description:** Uses the unique patterns in the colored ring of the eye (iris) for authentication.
- **Advantages:** Extremely high accuracy and low false acceptance rates.
- **Disadvantages:** Requires specialized and often expensive hardware

4. Voice Recognition:

- **Description:** Uses the unique features of a person's voice for authentication.
- **Advantages:** Can be used over the phone or in noisy environments.
- **Disadvantages:** Can be affected by illness, background noise, and voice mimicry.

5. Behavioral Biometrics:

- **Description:** Uses patterns in user behavior, such as typing rhythm or mouse movements, for authentication.
- **Advantages:** Continuous authentication and less intrusive.
- **Disadvantages:** Requires constant monitoring and may be less accurate for some users.

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threats posed by servers

1. Malware and Viruses:

- Malicious software designed to damage, disrupt, or gain unauthorized access to the server.
- It Can lead to data corruption, data theft, system performance degradation, and even complete server failure.
- Use anti-malware and antivirus software, keep systems updated, and educate users on safe practices.

2. Denial of Service (DoS) and Distributed Denial of Service (DDoS) Attacks:

- Overwhelming the server with a flood of requests, making it unavailable to legitimate users.

- Service disruption, loss of revenue, and damage to reputation.
- Implement rate limiting, use DDoS protection services, and set up firewalls.

3. Unauthorized Access:

- Unauthorized users gaining access to server resources.
- Data breaches, unauthorized data manipulation, and system compromise.
- Use strong authentication mechanisms, implement access controls, and monitor for unusual access patterns

4. Data Breaches:

- Unauthorized access to sensitive data stored on the server.
- Financial loss, legal consequences, and damage to reputation.
- Encrypt sensitive data, use secure communication protocols, and perform regular security audits.

5. SQL Injection:

- Inserting malicious SQL queries into input fields to manipulate the database.
- Data theft, data manipulation, and database corruption.
- Use prepared statements and parameterized queries, validate and sanitize inputs, and apply database security patches.

6. Cross-Site Scripting (XSS):

- Injecting malicious scripts into web pages viewed by other users.
- Theft of session cookies, defacement, and spreading malware.
- Sanitize user inputs, use Content Security Policy (CSP), and encode outputs properly.

7. Man-in-the-Middle (MitM) Attacks:

- Intercepting and possibly altering communication between the client and the server.
- Data theft, session hijacking, and unauthorized actions.

- Use HTTPS/TLS for secure communication, implement strong encryption, and use secure authentication mechanisms.

Digital signatures

1. Digital signatures are cryptographic mechanisms that provide a way to verify the authenticity and integrity of digital messages or documents.
2. They are a critical component of secure communication in the digital world.
3. Digital signatures are created using a combination of a user's private key and a hashing algorithm.
4. The document is hashed, and the hash is then encrypted with the user's private key to create the digital signature.
5. To verify a digital signature, the recipient uses the sender's public key to decrypt the hash and then hashes the received document.
6. If the hashes match, the document is verified as authentic and untampered.
7. Public Key Infrastructure (PKI) is Often used to manage and distribute keys securely.
8. It varies by jurisdiction, and some regions may have specific requirements for digital signatures to be legally binding.

SSL in E-commerce

1. Secure Socket Layer (SSL) is a cryptographic protocol designed to provide secure communication over a computer network.
2. When a client connects to an SSL-enabled server, the server sends its digital certificate to the client.
3. The client verifies the server's certificate against a list of trusted certificate authorities (CAs).
4. If the certificate is verified, the client generates a session key, encrypts it with the server's public key, and sends it to the server.
5. The server decrypts the session key using its private key. Both the client and server now have the same session key, which is used to encrypt and decrypt data for the duration of the session.

6. The client and server use the session key to encrypt and decrypt data, ensuring secure communication throughout the session.

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intrusion detection techniques

1. Signature-Based Detection:

- Definition: Compares observed activities against a database of known attack signatures.
- Pros: Effective against known threats.
- Cons: Ineffective against new or unknown attacks (zero-day vulnerabilities).

2. Anomaly-Based Detection:

- Definition: Establishes a baseline of normal behavior and detects deviations from this baseline.
- Pros: Can detect unknown attacks.
- Cons: May generate false positives if normal behavior changes.

3. Heuristic-Based Detection:

- Definition: Uses rules or algorithms to identify suspicious behavior.
- Pros: Can detect novel attacks.
- Cons: Requires regular updates and tuning to maintain effectiveness.

4. Behavioral Detection:

- Definition: Monitors user and system behavior for patterns that may indicate an attack.
- Pros: Can detect insider threats and other sophisticated attacks.
- Cons: Can be complex to implement and maintain.

5. Hybrid Detection:

- Definition: Combines multiple detection techniques (e.g., signature-based and anomaly-based) to improve accuracy.
- Pros: Balances the strengths and weaknesses of different methods.
- Cons: Can be resource-intensive.

6. Host-Based Intrusion Detection Systems (HIDS):

- Definition: Monitors and analyzes the internals of a computing system.
- Pros: Can detect local attacks and unauthorized changes to system files.
- Cons: Limited to individual host systems.

Functionality of antivirus

1. Antivirus software scans your files and incoming email for viruses and other malware, and then deletes anything malicious.
2. It can also scan removable devices for viruses.
3. Antivirus software can block unsafe websites or downloads, and flag suspicious activity.
4. It can also warn you about dangerous websites, attachments, links, and advertisements before you click on them.
5. Antivirus software can prevent identity theft and block phishing and fraud.
6. It can also scan the Dark Web to find if an email address has been compromised.
7. Antivirus software can protect your system from getting slow or corrupted, and protect your data and files from deleting.
8. Antivirus software can be free or paid, with paid versions providing more extensive protection.
9. It's important to keep your antivirus software up to date because antivirus vendors find new and updated malware daily.

Detecting and fixing virus

1. Computer viruses are typically detected through a combination of antivirus software and behavioral analysis.

2. Antivirus programs scan files and programs for known virus signatures or patterns that indicate malicious code.

3. They compare these patterns against a database of known threats.

4. Behavioral analysis monitors software behavior for suspicious activities that might indicate a virus, such as rapid file creation or unauthorized network activity.

5. Once a virus is detected, fixing the issue involves several steps.

6. Most antivirus programs attempt to quarantine or delete the infected files.

7. Some advanced antivirus software can also attempt to repair infected files by removing the malicious code while preserving essential data.

8. In cases where the virus has caused significant damage, restoring from a backup is often necessary.

Risk Management issues in E-Commerce

1. Cybersecurity: Protecting customer data from breaches, ensuring secure payment gateways, and safeguarding against hacking and phishing attacks.

2. Fraudulent Activities: Managing risks associated with credit card fraud, identity theft, and chargebacks.

3. Transaction Risks: Ensuring the integrity of transactions, including issues with transaction processing errors, transaction disputes, and non-payment.

4. Legal and Regulatory Compliance: Adhering to laws and regulations related to consumer protection, data privacy and taxation across different jurisdictions.

5. Supply Chain and Logistics: Managing risks related to inventory management, shipping delays, and fulfillment issues.

6. Reputation Management: Addressing risks that could damage the company's reputation, such as negative customer reviews, social media backlash, or public relations crises.

7. Financial Risks: Dealing with financial risks like fluctuating exchange rates (for international e-commerce), cash flow management, and managing financial transactions securely.

8. Technology Risks: Ensuring the reliability and availability of e-commerce platforms, managing risks associated with software vulnerabilities, and technological disruptions

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E-payment

1. E-payment in e-commerce refers to the electronic transactions conducted over the internet for purchasing goods or services.

2. It enables customers to make payments conveniently using various methods such as credit/debit cards, digital wallets, bank transfers, and cryptocurrencies.

3. Security measures like encryption, tokenization, and authentication ensure that sensitive payment information is protected during transmission and storage.

4. Payment gateways, such as Stripe or PayPal, facilitate secure transaction processing between customers, merchants, and banks. 5. E-payment enhances customer experience by offering a seamless checkout process and supporting mobile transactions.

6. Effective fraud prevention mechanisms, including fraud detection tools and chargeback management, mitigate risks associated with fraudulent activities.

7. Overall, e-payment plays a pivotal role in modern e-commerce, providing speed, convenience, and security in online transactions.

Security mechanisms for Email

1. Transport Layer Security (TLS): Encrypts email messages in transit between mail servers, ensuring they cannot be intercepted or read by unauthorized parties.
2. End-to-End Encryption (E2EE): Encrypts email content from the sender's device to the recipient's device, ensuring that only the sender and intended recipient can decrypt and read the message.
3. Sender Policy Framework (SPF): Verifies that incoming email messages come from an authorized mail server for the sender's domain.
4. DomainKeys Identified Mail (DKIM): Adds a digital signature to outgoing emails to verify their authenticity and detect tampering.
5. Domain-based Message Authentication, Reporting, and Conformance (DMARC): Provides email authentication and policy enforcement to prevent spoofing and phishing attacks.
6. Keep email servers, client applications, and security software up to date with the latest patches and security updates to protect against known vulnerabilities.

Unit 4 (Payment Systems)

Digital Payment Requirements

1. Acceptability : Payment infrastructure needs to be widely accepted.
2. Anonymity: Identity of the customers should be protected.
3. Convertibility: Digital money should be convertible to any type of fund.
4. Efficiency: Cost per transaction should be near zero.
5. Integration: Interfaces should be created to support the existing system.
6. Scalability: Infrastructure should not breakdown if new customers and merchants join.
7. Security: Should allow financial transactions over open networks.
8. Reliability: Should avoid single points of failure.
9. Usability: Payment should he as easy as in the real world.

Smart cards

1. Smart cards are plastic cards embedded with an integrated circuit chip.
2. This chip securely stores and processes information, enabling various functionalities beyond traditional magnetic stripe cards.
3. Users can load funds onto their smart cards either at designated terminals, banks, or online through associated accounts.
4. To make a payment, users insert or tap their smart card at a compatible terminal.
5. The terminal reads the card information securely stored on the chip.
6. The transaction details are verified through authentication processes embedded in the smart card, which may involve PIN entry or biometric verification for added security.
7. Once authorized, the transaction amount is deducted from the card's balance.
8. Data stored on the smart card chip is encrypted, making it difficult to clone or tamper with.
9. Smart cards are commonly used for fare payment in buses, trains, and metros, offering commuters a seamless travel experience.

Properties of Electronic Cash (E-Cash)

1. Digital Representation: E-cash exists purely in digital form, typically stored on electronic devices or servers.

2. Anonymity and Privacy: It allows users to conduct transactions anonymously or with a high degree of privacy, depending on the system's design.

3. Security: E-cash transactions are secured using encryption and cryptographic protocols to prevent unauthorized access and fraud.

4. Divisibility: Like physical cash, e-cash can be divided into smaller units, enabling microtransactions.

5. Transferability: E-cash can be transferred electronically between parties, facilitating quick and efficient transactions.

6. Irreversibility: Once a transaction is confirmed and recorded in the e-cash system, it is typically irreversible, enhancing security and preventing double-spending.

7. Offline and Online Usability: Depending on the system, e-cash can be used offline (stored locally on a device) or online (transmitted over the internet).

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risk in E-payment system

1. Data Breaches: Unauthorized access to sensitive information such as payment card details or personal information.
2. Phishing: Fraudulent attempts to obtain sensitive information through deceptive emails or websites.
3. Malware and Hacking: Malicious software or cyberattacks aimed at compromising payment systems or stealing data.
4. Identity Theft: Theft of personal information to make unauthorized transactions or create fake identities.
5. System Outages: Technical failures or downtime that prevent transactions from being processed.
6. Processing Errors: Incorrect or failed transactions due to system glitches or human error.

7. Fraudulent Transactions: Use of stolen or fake credentials to conduct unauthorized transactions.

Managing information privacy in e-payments systems.

- Data Encryption: Encrypt sensitive data, such as payment card details and personal information, during transmission and storage using strong encryption protocols like AES (Advanced Encryption Standard).
- Transport Layer Security (TLS): Implement TLS to secure data during transmission between users and the payment system.
- Multi-Factor Authentication (MFA): Implement MFA to add an additional layer of security, requiring users to provide two or more verification factors to access their accounts.
- Role-Based Access Control (RBAC): Limit access to sensitive information based on the user's role within the organization.
- Minimize Data Collection: Collect only the necessary data required to complete a transaction. Avoid storing sensitive information unless absolutely necessary.
- Data Anonymization: Where possible, anonymize personal data to protect user identities.
- Vendor Management: Ensure that third-party vendors and partners comply with your organization's security standards and regulations

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Characteristics of online payment system

- Encryption: Ensures that all transaction data is encrypted to protect against unauthorized access.
- Authentication: Requires verification of user identity through methods such as passwords, biometrics, or multi-factor authentication (MFA).
- Ease of Use: Designed to be user-friendly, allowing users to make payments quickly and with minimal effort.
- 24/7 Availability: Provides round-the-clock service, enabling transactions at any time.
- Instant Transactions: Facilitates immediate processing of transactions, reducing the time it takes for funds to be transferred between accounts.
- Real-Time Notifications: Sends instant notifications to users about the status of their transactions.
- Multiple Platforms: Available on various devices, including desktops, laptops, tablets, and smartphones.
- Global Reach: Enables cross-border transactions, allowing users to make payments anywhere in the world.

- Transaction History: Provides detailed records of all transactions, allowing users to track their spending and for businesses to manage their finances.

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token based electronic payment system

1. A digital token-based electronic payment system leverages cryptographic tokens to facilitate secure and efficient transactions.
2. These tokens represent value, rights, or access and are used in various payment and transaction contexts.
3. Tokens are issued by a central authority (e.g., a bank, financial institution, or blockchain platform) or through decentralized mechanisms.
4. Tokens can represent fiat currency, cryptocurrencies, or other assets like loyalty points, commodities, or even digital rights.
5. Sensitive payment information (e.g., credit card numbers) is replaced with a unique identifier or token..
6. This token is meaningless if intercepted, as it cannot be used outside the specific context of the original transaction.
7. The tokenization process employs cryptographic algorithms to ensure the token cannot be reverse-engineered to reveal the original data.
8. During a transaction, the token is used instead of the actual sensitive information
9. The transaction is verified by the issuing authority or through a decentralized network, ensuring the token's validity and preventing double-spending.

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public key certificates

1. Public key certificates are digital documents that use cryptographic techniques to validate the ownership of a public key.
2. They are commonly used in secure communication protocols such as SSL/TLS for securing websites and in various identity verification systems.
3. The public key is used to encrypt data or verify a digital signature.
4. It is part of a key pair that includes a private key.
5. The public key is distributed openly and is included in the certificate.
6. The issuer is the certificate authority that issued the certificate.
7. It includes information about the CA's identity and digital signature.
8. Each certificate has a unique serial number assigned by the CA to differentiate it from other certificates.
9. The certificate has a start date and an expiration date, defining the time period during which the certificate is valid.

Unit 5 (Customer Relationship Management)

Customer relationship management

1. Customer relationship management (CRM) is a combination of strategies, practices, and technologies that companies use to manage and analyze customer interactions and data throughout the customer lifecycle.
2. The goal of CRM is to improve customer service relationships, assist with customer retention, and drive sales growth.
3. CRM helps companies stay connected to customers, streamline processes, and improve profitability.
4. It gives organizations a clear understanding of where they stand in terms of customer experience, how well they influence their clients, and more.
5. The five steps of the CRM process are: Generate brand awareness, Acquire leads, Convert leads into customers, Provide superior customer service, and Drive upsells.
6. There are four types of CRM systems: Operational CRM systems, Analytical CRM systems, Collaborative CRM systems, and Strategic CRM systems.

Use of technology in E-CRM

- Centralized Database: Technology enables the creation of a centralized customer database where all customer information is stored and managed. This provides a single source of truth for customer data, making it easier to access and analyze.
- Data Integration: Integrates data from various sources, such as social media, email, website interactions, and CRM systems, to provide a comprehensive view of customer behavior and preferences.
- Automated Workflows: Automates repetitive tasks and processes, such as sending follow-up emails, scheduling appointments, and managing customer inquiries. This reduces manual effort and improves efficiency.
- Customer Segmentation: Uses technology to segment customers based on various criteria, such as demographics, purchase history, and behavior. This enables businesses to tailor marketing messages and offers to specific segments.
- Dynamic Content: Delivers personalized content and recommendations to customers based on their preferences and past interactions.

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businesses touch points

- Homepage: The primary entry point for many customers, providing initial impressions and information about the business.
- Product Pages: Detailed pages showcasing products or services, including descriptions, images, pricing, and specifications.
- Profiles and Pages: Business profiles on platforms like Facebook, Instagram, LinkedIn, and Twitter where companies share updates, promotions, and engage with customers.
- Direct Messaging: Private messaging features used for customer support and personalized interactions.
- Marketing Emails: Newsletters, promotional offers, and updates sent to customers to keep them informed and engaged.
- Phone Support: Customer service provided over the phone, offering assistance with inquiries, issues, and support.
- Physical Stores: Brick-and-mortar locations where customers can browse and purchase products in person.
- Print Ads: Advertisements in newspapers, magazines, and other print media.
- Reward Programs: Systems that offer incentives, such as discounts, special offers, or exclusive access, to encourage customer loyalty.

Customer relation goal

1. Deliver products and services that meet or exceed customer expectations.
2. Address customer complaints and issues quickly and effectively to minimize dissatisfaction and prevent negative experiences.
3. Offer incentives, such as discounts, rewards, or exclusive access, to recognize and appreciate loyal customers.
4. Tailor communications and offers to individual customer preferences and needs to create a more personalized experience.
5. Maintain regular and meaningful interactions with customers through various channels, such as email, social media, and events.
6. Continuously gather and analyze customer feedback to understand their needs and preferences, and adjust offerings accordingly.
7. Establish and maintain a trustworthy and reliable brand image through consistent and positive customer interactions.
8. Provide employees with the tools, training, and support needed to effectively manage customer relationships and deliver excellent service.

Integrated CRM application

1. An integrated CRM (Customer Relationship Management) application is a comprehensive system that combines various CRM functionalities into a unified platform, facilitating seamless management of customer interactions, data, and business processes.
2. The integration ensures that all customer-related information and processes are connected, streamlined, and accessible from a single system, improving efficiency and enhancing the customer experience.
3. CRM Provides a 360-degree view of each customer, integrating data from various touchpoints and interactions.
4. CRM Delivers personalized communication and service based on comprehensive customer insights.
5. It Facilitates collaboration among sales, marketing, and customer service teams through shared access to customer data.
6. One example is of Zoho CRM which offers sales automation, marketing automation, customer support, and analytics while integrating with other Zoho applications and third-party tools.

Using search engine to reach customer

1. By optimizing a website's content with relevant keywords, meta tags, and high-quality backlinks, businesses can improve their visibility on search engine results pages (SERPs).
2. Higher ranking increases the chances of reaching potential customers who are searching for related products or services.
3. Search engines offer pay-per-click (PPC) advertising, such as Google Ads.
4. Businesses can create targeted ads that appear at the top of SERPs for specific queries.
5. Creating high-quality, relevant content can drive organic traffic to a website.
6. Blogs, articles, and how-to guides that address customer pain points can improve search engine rankings and attract users interested in the content, leading to potential conversions.
7. Ensuring that a website is user-friendly, mobile-responsive, and fast-loading can improve search engine rankings.
8. A positive user experience leads to higher engagement and better chances of converting visitors into customers.

E-branding

1. E-Branding refers to the process of creating and promoting a brand's identity online.

2. It involves using digital platforms such as websites, social media, and email marketing to build and maintain a brand's image, reputation, and customer loyalty.
3. E-Branding allows businesses to establish a strong online presence.
4. This includes developing a unique brand voice, visual identity (such as logos and color schemes), and consistent messaging across various digital channels.
5. Through e-branding, companies can engage with customers in real-time via social media, blogs, and interactive content.
6. This engagement helps build trust and fosters a deeper connection between the brand and its audience.
7. Compared to traditional branding methods, e-branding is often more cost-effective.
8. Digital platforms offer a range of affordable marketing options, allowing brands to reach a global audience without significant expenses.

Data mining in CRM

1. Data mining is the process of discovering patterns, correlations, and insights from large sets of data using statistical, mathematical, and computational techniques.
2. It involves analyzing data to extract meaningful information that can be used for decision-making.
3. In CRM, data mining helps in segmenting customers based on various attributes such as demographics, purchasing behavior, and preferences.
4. This segmentation allows businesses to tailor their marketing strategies and offers to specific customer groups, enhancing relevance and engagement.
5. By analyzing customer data, businesses can create personalized marketing campaigns that resonate with individual preferences and behaviors.
6. This personalization increases the effectiveness of marketing efforts and improves customer satisfaction.

Customer Life Cycle in E-CRM

- Acquisition: The first stage in the customer life cycle involves acquiring new customers. This includes attracting potential customers through marketing campaigns, advertisements, and promotions.

- Onboarding: Once a customer is acquired, the onboarding stage focuses on integrating them into the company's ecosystem. This involves providing necessary information, setting up accounts, and introducing them to products or services.

- Engagement: During the engagement stage, businesses interact with customers through various channels such as email, social media, and customer support. The goal is to maintain ongoing communication, provide value, and address any issues.

- Retention: The retention stage focuses on keeping customers loyal and satisfied. This includes offering personalized offers, loyalty programs, and exceptional customer service.

- Reactivation: If a customer becomes inactive the reactivation stage seeks to re-engage them. This may involve targeted campaigns, special offers, or personalized communication to bring them back into active status.

Unit 6 (Supply Chain Management)

E Supply Chain Management

1. E Supply Chain Management (E-SCM) is the use of digital technologies to optimize and manage the various activities involved in a supply chain.
2. This includes everything from sourcing raw materials to delivering finished products to customers.
3. E-SCM utilizes electronic communication and data sharing between different supply chain partners.
4. By leveraging digital technologies such as cloud computing, big data analytics, and the Internet of Things (IoT), E-SCM enables real-time visibility and collaboration across the supply chain.
5. Technological advancements have elevated the need to effectively manage the supply chain, improving efficiency, reducing costs, and increasing customer satisfaction.
6. e-SCM is an integrated business application that automates the supply chain activities of organizations.
7. It is developed by combining an e-procurement system, an e-billing system, and other e-business tools.

E-SCM advantages

1. **Improved customer satisfaction:** SCM can help businesses fulfill customer promises and deliver products on time.
2. **Better inventory management:** SCM systems can help ensure that all items are accounted for and prevent overstocking or understocking.
3. **Reduced costs:** SCM can help businesses lower production costs by optimizing procurement and sourcing, and by identifying the most efficient shipping methods.
4. **Increased efficiency:** SCM can help businesses predict demand more accurately and develop strategies to meet it.
5. **Improved collaboration:** SCM can help businesses improve communication and productivity by facilitating better collaboration between suppliers, manufacturers, and retailers.
6. **Real-time data:** SCM can provide visibility into data across supply chain channels in real-time.
7. **Better risk mitigation:** SCM can help businesses make informed decisions and identify potential risks early on.

E-Supply Chain goals

1. E-Supply Chain goals focus on optimizing supply chain management through digital technologies.
2. Key objectives include enhancing efficiency, reducing costs, and improving accuracy by automating processes and integrating real-time data.
3. They aim to increase visibility across the supply chain, enabling better decision-making and responsiveness to market changes.
4. E-Supply Chains strive for seamless communication and collaboration among stakeholders, ensuring timely delivery and minimizing delays.
5. They also prioritize sustainability by reducing waste and promoting eco-friendly practices.
6. Ultimately, these goals lead to higher customer satisfaction, competitive advantage, and greater agility in adapting to evolving business environments.
7. Additionally, E-Supply Chains aim to enhance security by implementing advanced cybersecurity measures to protect sensitive data and prevent disruptions caused by cyber threats.

Agile manufacturing

Agile manufacturing in supply chain management refers to the ability to rapidly adapt to changes in demand, technology, and market conditions. It emphasizes flexibility, speed, and responsiveness in production processes and supply chain operations. Key features include:

1. **Rapid Response:** Quickly adjusting to customer needs and market trends.
2. **Flexibility:** Customizing products without sacrificing efficiency or cost.
3. **Collaboration:** Enhanced coordination with suppliers and partners to streamline operations.
4. **Technology Integration:** Utilizing advanced technologies like IoT, AI, and data analytics for real-time decision-making.
5. **Lean Practices:** Minimizing waste and maximizing value through continuous improvement.
6. **Resilience:** Building robust systems that can withstand disruptions and recover swiftly.


Push-based and pull-based supply chain management

1. Push-based and pull-based supply chain management are two different approaches to managing the flow of goods in a supply chain.

2. In a push-based supply chain, production is based on forecasts of future demand and market trends.
3. Companies use Material Requirements Planning (MRP) to produce goods and services ahead of time, and then push them through the supply chain to retailers.
4. This strategy is well-suited for products with stable demand, long lead times, high customization, or low inventory costs.
5. In a pull-based supply chain, production is based on current customer demand.
6. Companies use a Just-in-Time strategy to produce goods only when an order is received, rather than forecasting demand.
7. This strategy can help avoid overstocks and waste, reduce the risk of missed sales, and be more flexible.
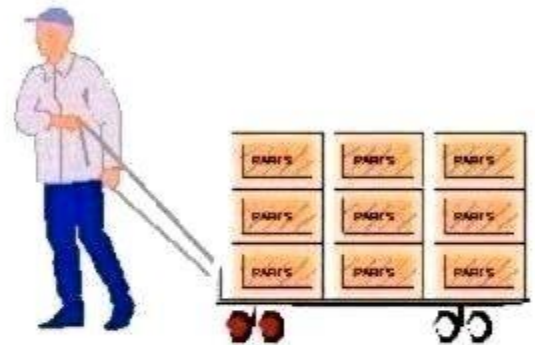

Push vs. Pull

Make all we can just in case.
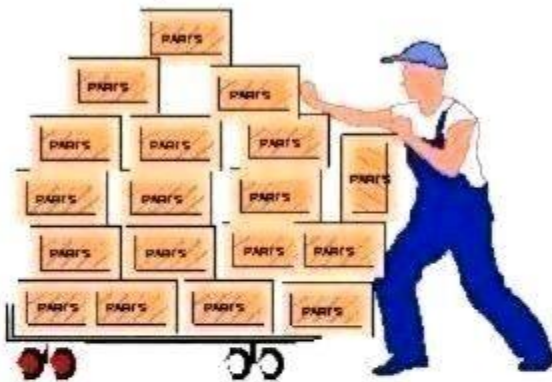
- Production Approximation
- Anticipated Usage's
- Large Lots
- High Inventories
- Waste
- Management by Firefighting
- Poor Communication

Make what's needed when we need it

- Production Precision
- Actual Consumption
- Small Lots
- Low Inventories
- Waste Reduction
- Management by Sight
- Better Communication

characteristics of supply chain management

1.Integration: Seamless coordination among various supply chain partners, including suppliers, manufacturers, and distributors, to optimize processes and information flow.

2. Agility: The ability to quickly respond to market changes and customer demands, ensuring timely delivery and maintaining service levels.

3. Visibility: Real-time tracking and monitoring of inventory, shipments, and orders throughout the supply chain, enabled by advanced technologies like IoT and data analytics.

4. Collaboration: Strong partnerships and communication among stakeholders to align objectives, share information, and solve problems collectively.

5. Efficiency: Streamlined operations to reduce costs, eliminate waste, and improve productivity through lean practices and continuous improvement.

6. Customer Focus: Prioritizing customer needs and expectations, ensuring high levels of satisfaction through reliable and responsive service.

7. Sustainability: Incorporating eco-friendly practices, reducing carbon footprint, and promoting resource conservation to create a more sustainable supply chain.

E-logistics

E-logistics, or electronic logistics, refers to the use of digital technologies and internet-based solutions to manage and optimize logistics operations. It encompasses the planning, implementation, and control of the movement and storage of goods, services, and information from origin to consumption. Key aspects include:

1. **Automation:** Streamlining logistics processes through automation, reducing manual intervention and increasing efficiency.
2. **Real-Time Tracking:** Utilizing GPS, IoT, and RFID technologies to provide real-time visibility and tracking of shipments, enhancing transparency and customer satisfaction.
3. **Data Analytics:** Leveraging big data and analytics to forecast demand, optimize routes, manage inventory, and make informed decisions.
4. **Integration:** Connecting various logistics functions and stakeholders through integrated platforms, facilitating seamless information flow and coordination.
5. **Inventory Management:** Employing advanced inventory management systems to monitor stock levels, automate replenishment, and minimize holding costs.

Components of E-SCM

1. Suppliers:

- Provide raw materials or components.
- Integrated through electronic data interchange (EDI) for real-time communication.

2. Manufacturers:

- Convert raw materials into finished products.
- Utilize automation, IoT, and advanced planning systems for efficient production.

3. Warehouses:

- Store raw materials, work-in-progress items, and finished goods.
- Employ warehouse management systems (WMS) for inventory tracking and optimization.

4. Distributors:

- Handle the distribution of products to various locations.
- Use transportation management systems (TMS) to optimize routes and manage logistics.

5. Retailers:

- Sell products to end customers.

- Utilize point-of-sale (POS) systems and e-commerce platforms for sales and inventory management.

6. Customers:

- The end-users who purchase and consume the products.
- Provide feedback and demand data for supply chain adjustments.

7. Technology Platforms:

- Include ERP systems, cloud computing, IoT, AI, and blockchain for data integration, analysis, and security.

Unit 7 (Stratergy)

Virtual value chain

1. A virtual value chain (VVC) is a business model that describes how value-generating services are distributed within an extended enterprise. In a VVC, value-adding steps are virtual because they are performed through and with information.
2. The VVC starts with the provider's information, which is then distributed and supported through the information infrastructure, before the customer or end user interacts with it.
3. The five activities involved in creating value at any stage of a VVC are: Gathering information, Organizing information, Selecting information, Synthesizing information, and Distributing information.
4. A VVC can be a tool for identifying ways to create customer value in a market space where services are delivered digitally through information-based channels.
5. For example, a hair stylist might send an automated text message to remind a customer of an upcoming appointment, and the customer can click a link to reschedule if needed.

Seven Dimensions of E-stratergy

1. Leadership:

- The role of leadership is setting the direction and vision for e-commerce initiatives.
- Effective decision-making processes and how leadership drives e-commerce strategy.

2. Technology:

- Choosing the right e-commerce technology and platforms.
- Leveraging new technologies and staying updated with tech trends.

3. Infrastructure:

- The underlying infrastructure that supports e-commerce operations.
- Ensuring the infrastructure can handle growth and provide reliable service.

4. Brand:

- Building and maintaining a strong online brand presence.
- How the brand stands out in the e-commerce market.

5. Service:

- Providing support and assistance to customers.
- Ensuring high standards in service delivery.

6. Markets:

- Understanding target markets and customer segments.
- creating Strategies for entering and expanding in different markets.

7. Organizational Learning:

- Collecting and using insights from e-commerce activities.
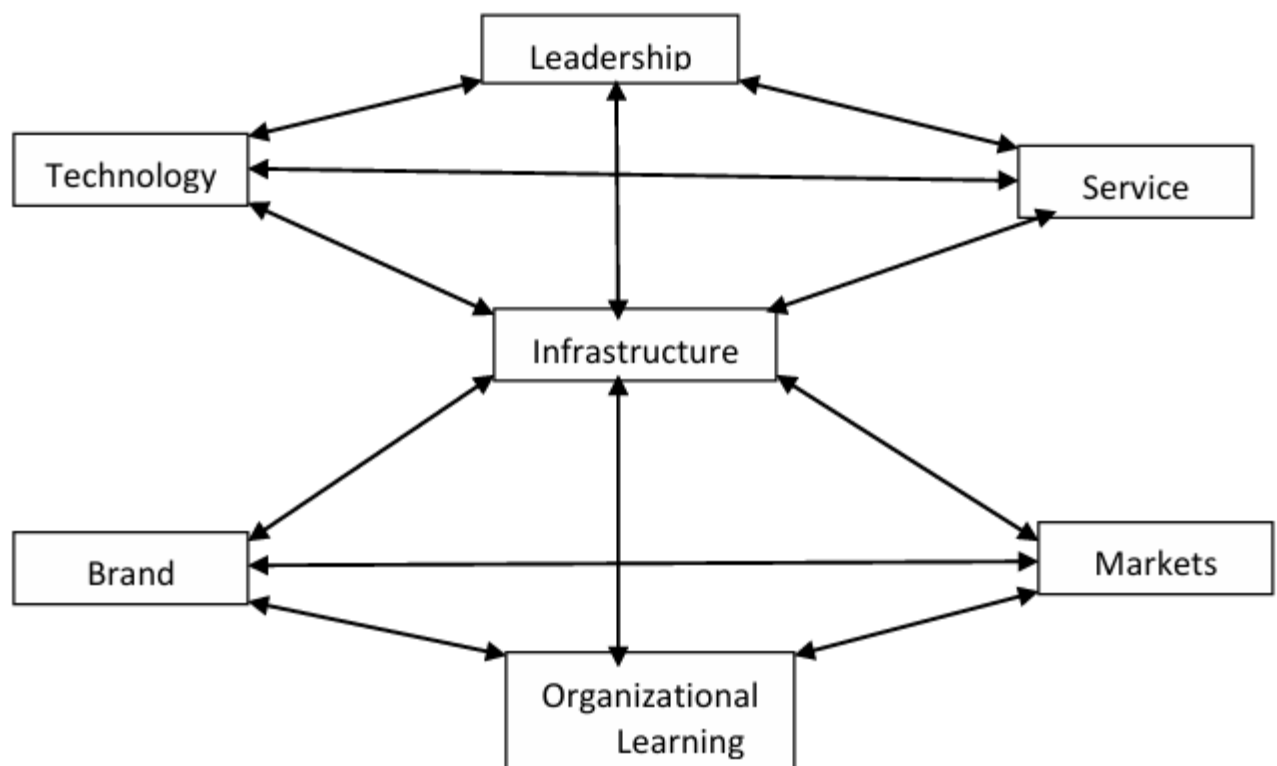- Adapting and improving strategies based on learning and feedback.

Fig 7.7The seven dimensions of e-strategy.

Note: If you have trouble in remembering these 7 words then remeber the following sentence:
"Tigers Love Sex In Organized BombayMarkets."

- **Tigers** = **Technology**

- **Love** = **Leadership**

- **Sex** = **Service**

- **In** = **Infrastructure**

- **Organized** = **Organizational Learning**

- **Bombay** = **Brand**

- **Markets** = **Market**

Data warehousing

1. Data warehousing is a method of organizing and storing data from multiple sources into a single database.

2. The data is usually combined using a process called extract, transform, and load (ETL), which uses business rules to clean and organize the raw data.

3. The data warehouse then provides a centralized repository that can be used to support decision-making, reporting, querying, and analysis.

4. Data warehouses can help workers find relevant data consistently and research details in a stable environment.

5. Some examples of data warehouses include:

6. Amazon Redshift : A cloud-based data warehouse that's part of Amazon Web Services (AWS). It's popular with businesses that already use other AWS services and is easy to use.

7. Azure Synapse Analytics: An enterprise analytics service that combines SQL technologies, Apache Spark technologies, and Azure Data Explorer.

Unit 8 (Mobile Commerce)

Mobile commerce

Mobile commerce, or m-commerce, refers to the buying and selling of goods and services through mobile devices such as smartphones and tablets. It encompasses a wide range of activities, including:

- **Mobile Shopping**: Purchasing products directly through mobile apps or websites optimized for mobile devices.
- **Mobile Banking**: Managing bank accounts and performing financial transactions using mobile banking apps.
- **Mobile Payments**: Using mobile wallets or payment apps (like Apple Pay, Google Pay) to make transactions.
- **Mobile Advertising**: Marketing products and services through ads displayed on mobile devices.
- **Mobile Ticketing**: Buying and storing tickets for events, travel, or other activities on mobile devices.

WAP origin

1. Wireless Application Protocol (WAP) is a set of protocols used to enable access to the internet and web services via mobile devices.

2. It was developed to address the limitations of early mobile devices and networks in terms of bandwidth, screen size, and processing power.

3. WAP was introduced in the late 1990s by the WAP Forum, a consortium of companies including Nokia, Ericsson, Motorola, and others.

4. The aim was to standardize how mobile devices could access and interact with web content.

5. Th 3rde WAP Forum was established in 1997, and the first version of the WAP st¹andard (WAP 1.0) was released in 1999.

6. WAP 2.0, introduced in 2002, brought significant improvements, including support for XHTML and improved support for interactive applications.

7. With the advancement of mobile networks (3G, 4G) and smartphones, the need for WAP diminished. Modern mobile web browsing relies on technologies like HTML5 and responsive web design.

Applications of Mobile Commerce

1. Mobile Banking and Payments:

Using mobile apps for managing bank accounts, transferring money, paying bills, and making payments through solutions like Apple Pay, Google Pay, and Samsung Pay.

2. Mobile Shopping:

Retailers and e-commerce platforms provide mobile-optimized websites and apps for browsing products, comparing prices, and making purchases.

3. Location-Based Services:

Apps use GPS and location data to offer services such as finding nearby restaurants or stores, receiving location-based offers and discounts, and using ride-sharing or navigation services.

4. Mobile Reservations and Tickets:

Users can book hotel rooms, flights, and event tickets through mobile apps, with features for checking availability, comparing options, and managing bookings.

5. Mobile Advertising:

Businesses use mobile platforms for targeted advertising through apps, social media, and mobile websites, utilizing user data and behavior for personalized ad delivery.

Wireless Application Protocol (WAP)

1. The Wireless Application Protocol (WAP) is a set of communication protocols and an application programming model based on the World Wide Web (WWW).

2. Its hierarchical structure is quite similar to the TCP/IP protocol stack design.

3 The user opens the mini-browser in a mobile device.

4.He selects a website that he wants to view.

5. The mobile device sends the URL encoded request via network to a WAP gateway using WAP protocol.

6. The WAP gateway translates this WAP request into a conventional HTTP URL request and sends it over the internet.

7. The request reaches to a specified web server and it processes the request just as it would have processed any other request and sends the response back to the mobile device through WAP gateway in WML file which can be seen in the micro-browser.
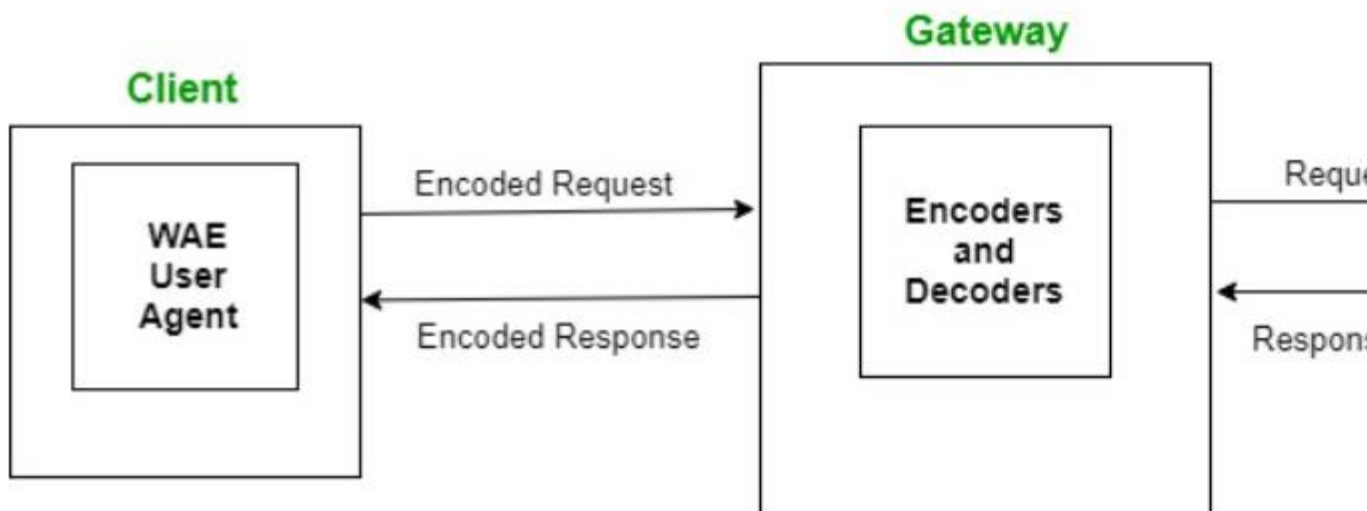
GPRS

1. General packet radio service (GPRS) is defined as a mobile communications standard that operates on 2G and 3G cellular networks to enable moderately high-speed data transfers using packet-based technologies.

2. General packet radio service (GPRS) is essentially a packet-switching technology that allows information to be transmitted via mobile networks.

3. This is utilized for internet connectivity, multimedia messaging service, and other types of data transmission.

4. GPRS is supported by GPRS cellphones, as well as laptops and handheld devices equipped with GPRS modems.

5. The global system for mobile communications (GSM) is the primary standard for the second generation (2G) cellular network, while GPRS is an improved version.

6. GPRS also allows network operators to deploy an IP-based core architecture for integrated audio and data applications, which can be used and improved for 3G networks.

WDP

1. Wireless Datagram Protocol (WDP) is a service that allows the Wireless Application Protocol (WAP) to be independent of data services that transmit information signals between networks.
2. It's part of the WAP suite and covers the Transport Layer Protocols in the Internet model.
3. WDP adapts the transport layer of a data service and presents a consistent data format to the top layer of the WAP protocol stack.
4. WDP operates above the data capable bearer services supported by various network types, including SMS, USSD, CSD, CDPD, and GPRS.
5. It sends and receives messages via any available bearer network, and its main purpose is to offer a consistent interface for upper layers.

Short Message Service

1. Short Message Service (SMS) is a communication protocol used for sending short text messages between mobile devices.
2. SMS messages are typically limited to 160 characters per message.
3. If the message exceeds this limit, it is split into multiple messages, which are reassembled by the recipient's device.
4. SMS operates over the signaling channels of mobile networks, which are separate from the voice channels used for phone calls.
5. This allows SMS messages to be sent and received independently of voice communication.
6. SMS is used for various purposes, including personal communication, notifications, alerts, and authentication (e.g., one-time passwords).
7. It is also widely used in marketing and customer service.
8. SMS is known for its reliability, with messages typically being delivered within seconds.
9. It does not require an internet connection, making it accessible even in areas with poor data connectivity.

USSD

1. Unstructured Supplementary Service Data (USSD) is a protocol used by mobile phones to communicate with a service provider's computer.
2. USSD operates in real-time and provides a way to interact with various services through simple text-based menus.
3. USSD operates in a session-based manner, meaning that it maintains an open connection for the duration of the interaction.
4. This allows for real-time communication and immediate responses.
5. Users interact with USSD services through menu-driven options. When a user dials a USSD code (e.g., *123#), they receive a menu of options that they can select by entering corresponding numbers.
6. USSD does not require an internet connection to function. It uses the signaling channels of the mobile network, making it accessible even in areas with limited or no internet connectivity.
7. SSD is commonly used for various services such as:

- Checking account balances and transaction history for banking services.

- Activating or deactivating mobile services and features (e.g., data plans or call forwarding).
- Accessing customer support and information services.
- Conducting mobile payments and recharging mobile credit.

CSD

1. Circuit Switched Data (CSD) is a method of data transmission used in traditional telecommunication networks, where a dedicated communication path is established between two points for the duration of a call or data session.
2. In CSD, a dedicated circuit is set up between the sender and receiver for the entire duration of the communication session.
3. This means that the bandwidth is reserved exclusively for that session, ensuring a constant connection.
4. CSD was commonly used for early mobile data services and is associated with older cellular network technologies such as GSM (Global System for Mobile Communications).
5. It allowed users to transmit data over mobile networks by establishing a dial-up connection similar to traditional landline modems.
6. With the advent of more advanced mobile data technologies such as GPRS, 3G, 4G, and 5G, which use packet-switching methods, CSD has largely been replaced.

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micro-browser

1. A micro-browser is a type of web browser designed specifically for mobile devices with limited resources.
2. It enables users to access and view web content on devices with smaller screens and less processing power compared to desktop computers.
3. They often feature simplified interfaces and reduced functionality to provide a better user experience on mobile devices.
4. Compared to full-featured desktop browsers, micro-browsers typically support only essential web functions.
5. They may have limited support for complex web technologies, such as JavaScript, CSS, and multimedia content.
6. Micro-browsers often include features to adapt web content for mobile viewing.

7. This can involve reformatting web pages to fit smaller screens, adjusting text sizes, and optimizing images to reduce loading times and data usage.
8. As mobile technology has advanced, the need for specialized micro-browsers has decreased.