

UNIT 1
E-BUSINESS

- Introduction
- E-commerce-definition
- History of e-commerce
- Types of e-commerce
- Comparison of traditional commerce and e-commerce
- E-commerce business models
 - ✓ B2B
 - ✓ B2C
 - ✓ C2C
 - ✓ C2B
 - ✓ P2P
- Emerging trends of e-commerce
- Advantages/disadvantages of e-commerce
- Web auctions
- Virtual communities
- Portals
- E-business revenue models

INTRODUCTION

BUSINESS

- Business is an economic activity that involves the exchange, purchase, sale or production of goods and services with a motive to earn profits and satisfy the needs of customers.
- Businesses can be both profit or non-profit organizations that function to gain profits or achieve a social cause respectively.
- Every business activity includes an exchange or transfer of services and goods to earn value.
- The purpose to conduct the business is to earn profits.

E-BUSINESS

- **E-Business (electronic business)** is any process that a business organization conducts over a computer-mediated network.
- Business organizations include any for, profit, governmental, or non-profit entity.
- Their processes include production, customer, and internal or management-focused business processes.
- Electronic business (e-business) refers to the use of the Web, Internet, intranets, extranets or some combination thereof to conduct business.

E-business is the conduct of business processes on the internet.

E-COMMERCE

- E-commerce is the buying and selling of goods and services over the Internet.
- It is conducted over computers, tablets, smart phones, and other smart devices.
- E-commerce or electronic commerce is the buying and selling of goods and services, or the transmitting of funds or data over an electronic network (internet).
- These business transactions may occur either as business to business, business to consumer, consumer to consumer, consumer to business (b2b, b2c, c2c, c2b).



Ecommerce

['ē kă-(,)mərs]

Companies and individuals that buy and sell goods and services over the Internet.

ECOMMERCE

Exchange of goods and services online

Extroverted approach

Subset of eBusiness

Uses the internet for transactional purpose

Need to set up a new or additional business model

EBUSINESS

Any kind of business activity done using online platforms

Holistic approach

Superset of eCommerce

Uses internet for performing a wide array of activities

Can reinvent a traditional offline business

HISTORY OF E-COMMERCE

1960 – 1982: Invention and the Early Days

- The development of the Electronic Data Interchange (EDI) in the 1960s paved the way for electronic commerce.
- EDI replaced traditional mailing and faxing of documents by allowing a digital transfer of data from one computer to another.
- Trading partners could transfer orders, invoices, and other business transactions using a particular data format.
- Once an order is sent, it is then examined by a VAN (value added network) and directed to the recipient's order processing system.
- EDI allowed the transfer of data seamlessly without any human intervention.

1982 – 1990: Early Ecommerce Platforms

- It was apparent from the beginning that these early advancements would make B2B online shopping commercially lucrative.
- B2C would not be successful until the later widespread use of PCs and the World Wide Web.
- In 1982, France launched Minitel, an online service that used a Videotex terminal machine accessed through telephone lines.
- The Minitel was free to telephone subscribers and connected millions of users to a computing network.
- By 1997, over 7 million homes had Minitel terminals.
- The Minitel system was popular before falling out of favor after the success of the internet three years later.

Early 90's: The World Wide Web Arrives

- In 1990 Tim Berners-Lee published a proposal to build a “Hypertext project” called “World Wide Web.”
- That same year, Berners-Lee created the first web server and wrote the first web browser.
- Shortly thereafter, he went on to debut the web on August 6, 1991 as a publicly-available service on the Internet.
- When Berners-Lee decided he would take on the task of marrying hypertext to the Internet, the process led him to develop URL, HTML and HTTP.
- In 1991, the National Science Foundation lifted its restrictions on commercial use of the NET, causing online shopping to grow exponentially. In September 1995, the NSF began charging a fee for registering domain names.
- The number of domain names quickly grew to two million by 1993. By this time, the NSF’s role in the Internet came to an end and a lot of the oversight shifted to the commercial sector.

Mid '90s to Present: Marketplaces, Payments and The Growth of Ecommerce

Major Marketplaces Emerge: Amazon, eBay, and Ecommerce Platforms

- In the mid-90s, there were major advancements in the commercial use of the Internet.
- One of the first ecommerce sites was Amazon, which started in 1995 as an online bookstore but grew to become the largest online retailer in the world.
- Amazon, being an online only store without physical limitations, was able to offer exponentially more products to the shopper.
- Amazon's range has expanded over the years and now includes music, video downloads, electronics, apparel, furniture, food, and toys.
- Other ecommerce marketplace success stories include eBay, an online auction site that debuted in 1995, and Etsy, which launched in 2005.

TYPES OF E-COMMERCE

There are 6 basic types of e-commerce:

- **Business-to-Business (B2B)**
- **Business-to-Consumer (B2C)**
- **Consumer-to-Consumer (C2C)**
- **Consumer-to-Business (C2B)**
- **Peer-to-Peer (P2P)**
- **Business-to-Administration (B2A)**
- **Consumer-to-Administration (C2A)**

▪ *Business-to-Business (B2B)*

▪ Business-to-Business (B2B) e-commerce encompasses all electronic transactions of goods or services conducted between companies.

▪ Producers and traditional commerce wholesalers typically operate with this type of electronic commerce.

▪ Examples- Udaan, JioMart, Amazon Business, Indiamart, etc.

▪ *Business-to-Consumer (B2C)*

- The Business-to-Consumer type of e-commerce is distinguished by the establishment of electronic business relationships between businesses and final consumers.
- It corresponds to the retail section of e-commerce, where traditional retail trade normally operates.
- This type of commerce has developed greatly, due to the advent of the web, and there are already many virtual stores and malls on the Internet, which sell all kinds of consumer goods, such as computers, software, books, shoes, cars, food, financial products, digital publications, etc.
- Examples- Amazon, Flipkart, Myntra, etc.

■ **Consumer-to-Consumer (C2C)**

- Consumer-to-Consumer (C2C) type e-commerce encompasses all electronic transactions of goods or services conducted between consumers.
- Generally, these transactions are conducted through a third party, which provides the online platform where the transactions are actually carried out.
- Examples- OLX, Amazon Marketplace, etc.

▪ **Consumer-to-Business (C2B)**

- In C2B there is a complete reversal of the traditional sense of exchanging goods.
- This type of e-commerce is very common in crowd sourcing based projects.
- A large number of individuals make their services or products available for purchase for companies seeking precisely these types of services or products.
- Examples of such practices are the sites where designers present several proposals for a company logo and where only one of them is selected and effectively purchased.

■ *Peer-to-Peer (P2P)*

- The peer-to-peer business model's purpose is to act as an intermediary between individuals.
- It works as a matchmaker in the middle of two sides: one who has something to offer (a product or service) and others who can benefit from this offer.
- The peer-to-peer (or P2P) economy is the model where two individuals buy (demand) and sell (supply) goods directly, in terms of delivering the product or service.
- The seller is a private independent individual who produces the merchandise or offers the service themselves.
- Buyer and seller don't need a firm that owns all the means of production and labor to perform the whole production process.
- On the other hand, they benefit from companies that operate as intermediary firms, in order to connect both sides.
- Examples- Open-source Software,

▪ *Business-to-Administration (B2A)*

- This part of e-commerce encompasses all transactions conducted online between companies and public administration.

- This is an area that involves a large amount and a variety of services, particularly in areas such as fiscal, social security, employment, legal documents and registers, etc.

- These types of services have increased considerably in recent years with investments made in e-government.

- Example- OpenGov

Consumer-to-Administration (C2A)

- The Consumer-to-Administration model encompasses all electronic transactions conducted between individuals and public administration.
- Examples of applications include:
 - Education – disseminating information, distance learning, etc.
 - Social Security – through the distribution of information, making payments, etc.
 - Taxes – filing tax returns, payments, etc.
 - Health – appointments, information about illnesses, payment of health services, etc.
- Both models involving Public Administration (B2A and C2A) are strongly associated to the idea of efficiency and easy usability of the services provided to citizens by the government, with the support of information and communication technologies.
- Example- **Electronic Federal Tax Payment System (EFTPS)**

Comparison of traditional commerce and e-commerce

SL. NO	TRADITIONAL COMMERCE	E-COMMERCE
1.	Traditional commerce refers to the commercial transactions or exchange of information, buying or selling product/services from person to person without use of internet.	E-commerce refers to the commercial transactions or exchange of information, buying or selling product/services electronically with the help of internet.
2.	In traditional commerce, it is difficult to establish and maintain standard practices.	In e-commerce, it is easy to establish and maintain standard practices.
3.	Direct interaction through seller and buyer.	Indirect interaction through seller and buyer occurs using electronic medium and internet.
4.	Traditional commerce is carried out by face to face, telephone lines or mail systems.	E-commerce is carried out by internet or other network communication technology.

SL. NO	TRADITIONAL COMMERCE	E-COMMERCE
5.	In traditional commerce, processing of transaction is manual.	In e-commerce, processing of transaction is automatic.
6.	In traditional commerce, delivery of goods is instant.	In e-commerce, delivery of goods takes time.
7.	Its accessibility is for limited time in a day.	Its accessibility is $24 \times 7 \times 365$ means round the clock.
8.	Traditional commerce is done where digital network is not reachable.	E-commerce is used to save valuable time and money.

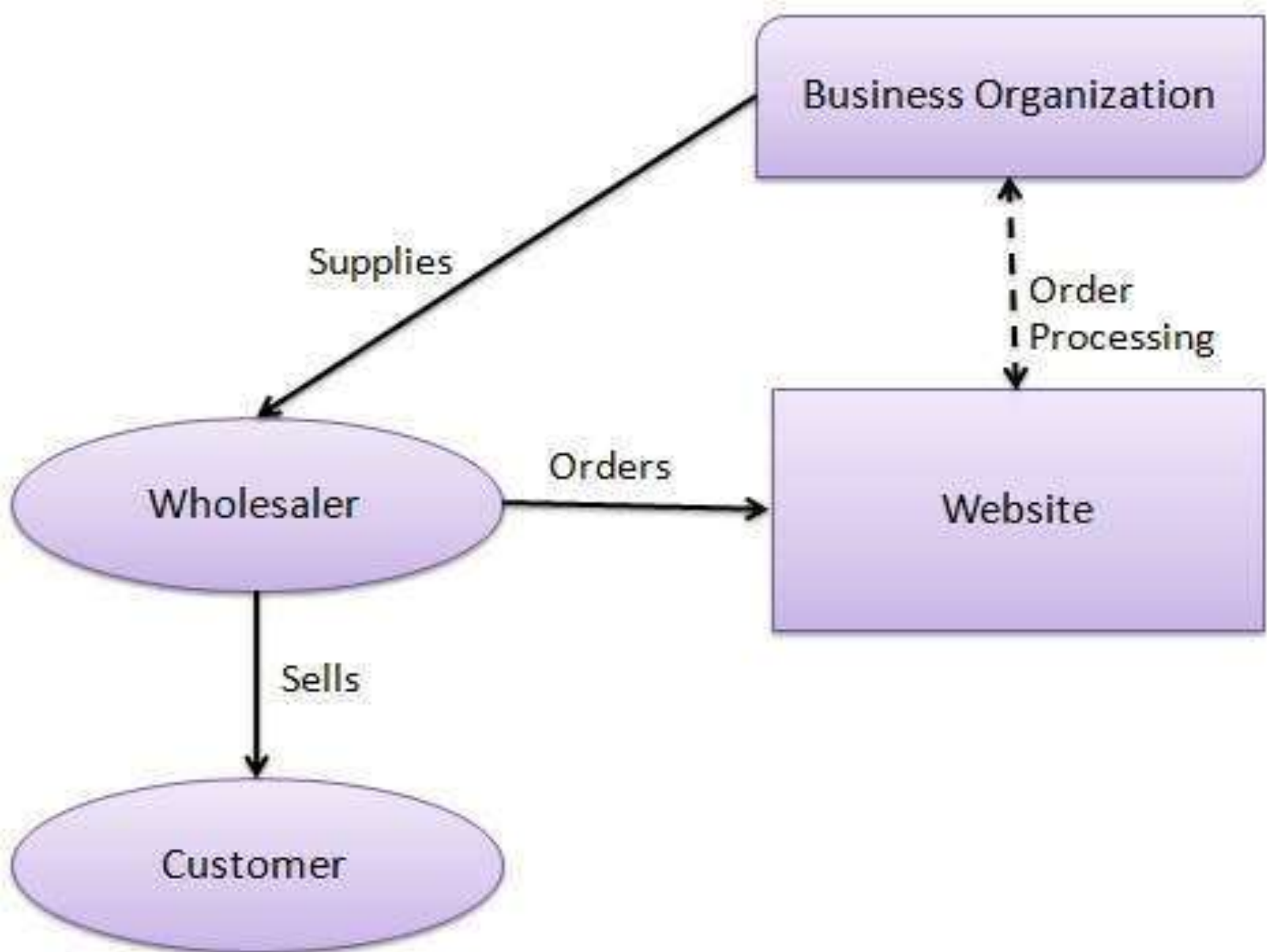
SL. NO	TRADITIONAL COMMERCE	E-COMMERCE
9.	Traditional commerce is a older method of business style which comes under traditional business.	E-commerce is a newer concept of business style which comes under e-business.
10.	In traditional commerce, customers can inspect products physically before purchase.	In e-commerce, customers can not inspect products physically before purchase.
11.	Its business scope of business is a limited physical area.	Its business scope is worldwide as it is done through digital medium.
12.	For customer support, information exchange there is no such uniform platform.	For customer support, information exchange there is exists uniform platform.

***E-commerce
business models***

- E-commerce business models can generally be categorized into the following categories.
- Business - to - Business (B2B)
- Business - to - Consumer (B2C)
- Consumer - to - Consumer (C2C)
- Consumer - to - Business (C2B)

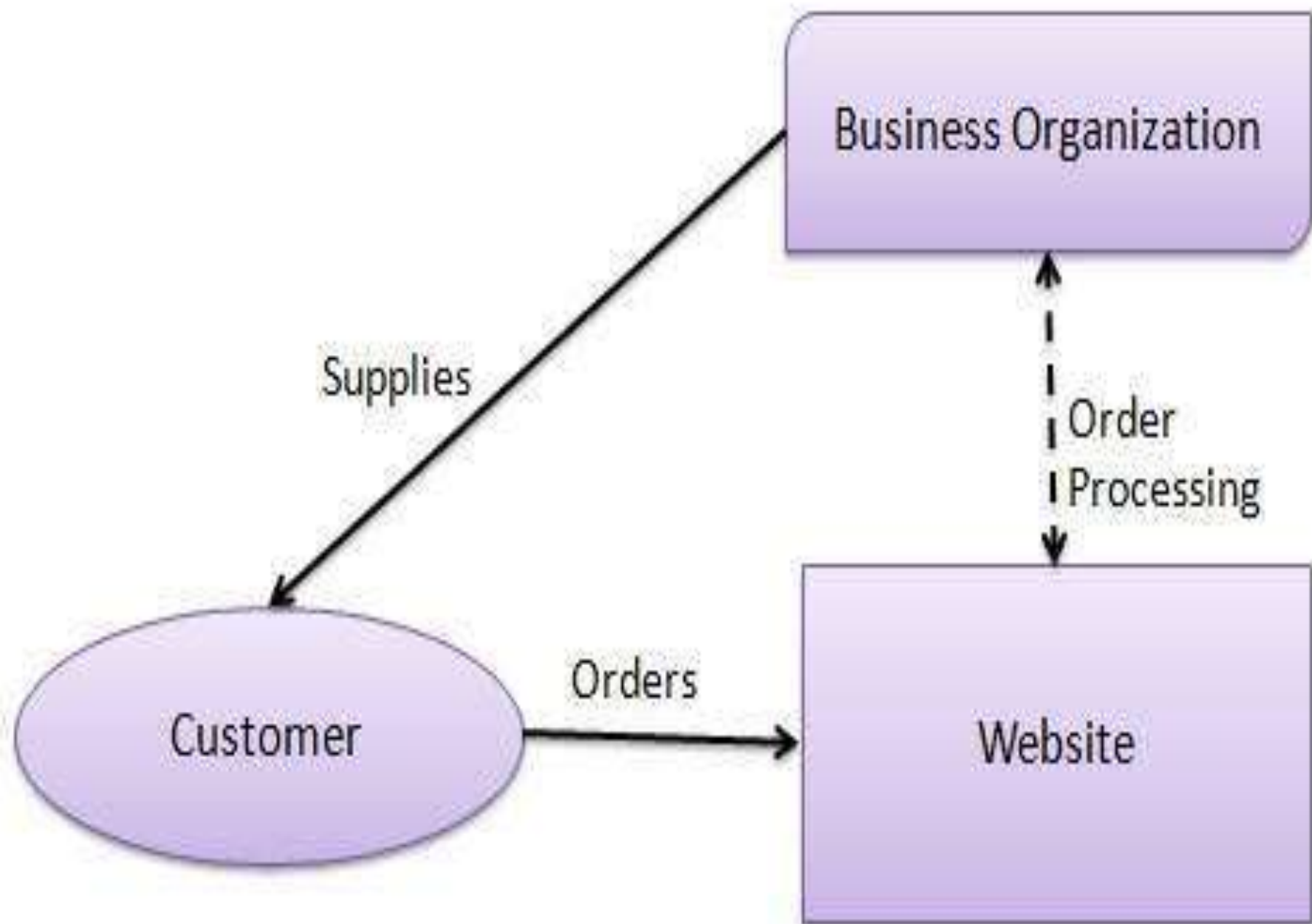
▪ *Business - to - Business*

- A website following the B2B business model sells its products to an intermediate buyer who then sells the product to the final customer.
- As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end-product to the final customer who comes to buy the product at one of its retail outlets.



▪ *Business - to - Consumer*

- A website following the B2C business model sells its products directly to a customer.
- A customer can view the products shown on the website.
- The customer can choose a product and order the same.
- The website will then send a notification to the business organization via email and the organization will dispatch the product/goods to the customer.



▪ *Consumer - to - Consumer*

- A website following the C2C business model helps consumers to sell their assets like residential property, cars, motorcycles, etc., or rent a room by publishing their information on the website.
- Website may or may not charge the consumer for its services.
- Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.

Places advertisement



Want to sell products

Want to buy products

receives products

Customer 1

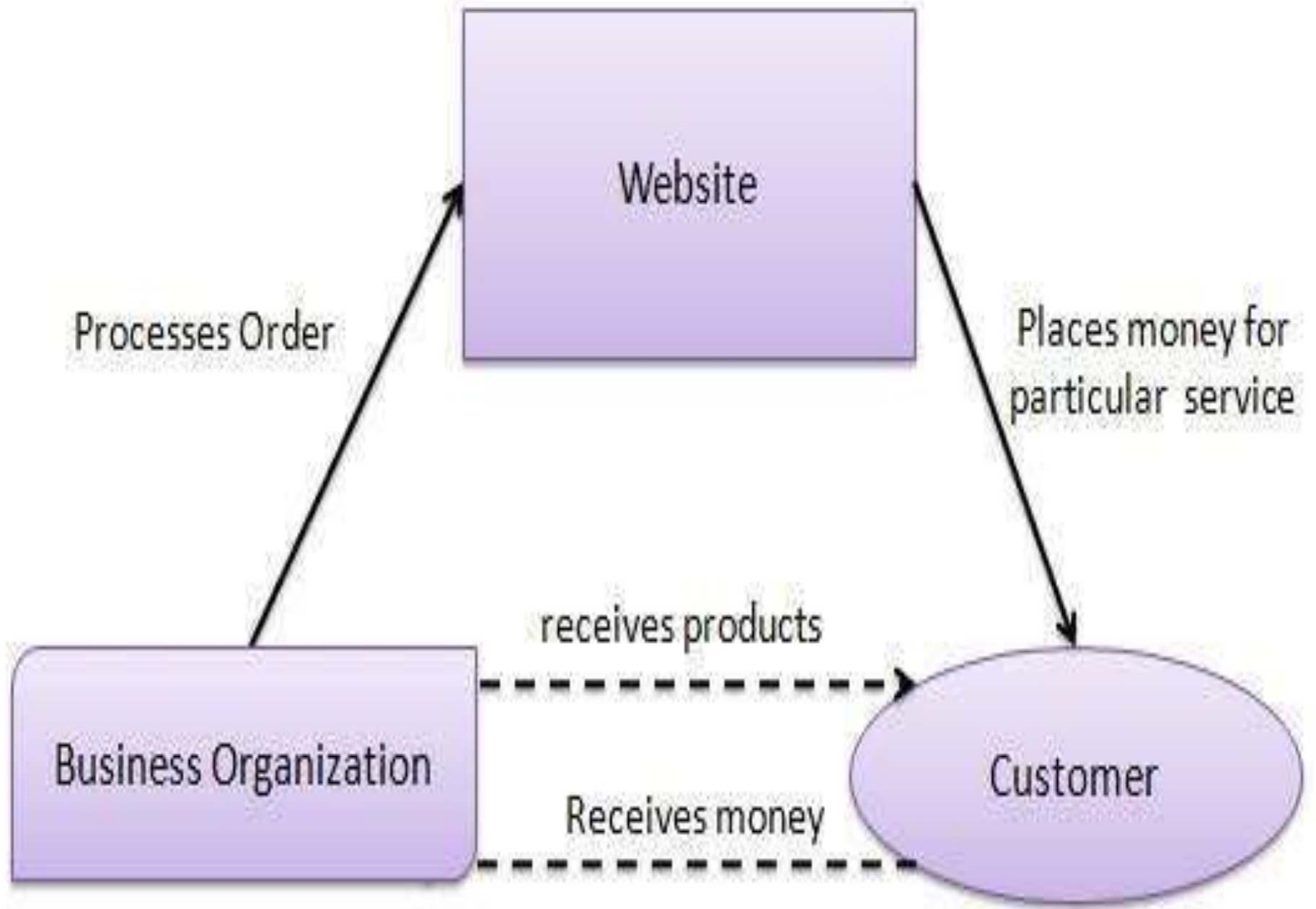
Customer 2

Receives money



▪ *Consumer - to - Business*

- In this model, a consumer approaches a website showing multiple business organizations for a particular service.
- The consumer places an estimate of amount he/she wants to spend for a particular service.
- For example, the comparison of interest rates of personal loan/car loan provided by various banks via websites.
- A business organization who fulfills the consumer's requirement within the specified budget, approaches the customer and provides its services.



Emerging trends of e-commerce

- The global E-commerce industry is changing rapidly.
- Online businesses must keep up with the latest E-commerce trends and ever-changing consumer demand to stay relevant and competitive.

1. Augmented reality enhances the reality of online shopping.

Augmented reality (AR) has been a complete game changer for ecommerce. With this type of technology, shoppers can truly see the item they're shopping for, which helps them make a buying decision. AR really changes the shopping experience in specific industries, such as fashion and home decor because the customer can get a better feel for the item without seeing it in-person.

AR grants a person with the ability to not just see a 3D model of a product but lets a user see how it looks if they were actually wearing it. Some products and industries lend themselves better to traditional shopping methods, but AR is going to shake things up sooner than later.

2. Voice and Visual Searches

Thanks to the advancement of AI, customers can now take advantage of visual and voice searches. These AI-powered site search systems use machine learning and natural language processing to determine the intent behind a search query and offer the most relevant results.

Visual search lets online shoppers conduct searches using images. The **ASOS** app employs visual search through the Style Match feature. It lets visitors upload a photo of an item they want to purchase online, then generates a list of products most similar to the uploaded image.

Business owners can join this shopping trend by using high-quality product photos. This helps amplify your store's discoverability on platforms with a visual search feature, like Google and Pinterest.

3. AI helps shops learn about shoppers.

Artificial Intelligence (AI) and machine learning make it possible for the customer to have automated, personalized shopping experiences. AI is continuously collecting data on how a customer shops, when they buy purchases and what they're looking for in a product or a service. It's a piece of technology that really can't be replicated in-store.

4. On-site personalization uses those insights to create individualized experiences.

Buyers of all sorts — including B2C and B2B — are looking for personalized, custom shopping experiences online. The data collected from AI is what makes it possible for a buyer to get personalized product recommendations and detailed customer service.

Implementing personalized experiences on-site or in marketing efforts has been shown to have a strong effect on revenue, with one study finding it had a 25% revenue lift for retailers scaling advanced personalization capabilities.

5. Customer Relationship Management

Customer relationship management (CRM) includes tools and strategies to help e-Commerce businesses manage customer interaction. A great CRM strategy is essential, as 92% of customers would abandon after two or three negative interactions.

CRM lets business owners understand their customers' needs and behavior better. This helps strengthen relationships and build a loyal customer base.

The CRM market size is expected to hit around \$128 billion by 2028. Additionally, over 91% of companies with 10 or more employees use CRM to manage customer conversations.

6. Customer Support as a Priority

Customer support has been and will always be essential in every business. Issues with products or services can turn away existing customers and potential buyers. Ultimately, a company is responsible for offering quality assistance.

81% of customers believe a positive support experience encourages repeat purchases. Reply time is essential, and 60% of the customers agrees that 10 minutes or less is the benchmark for immediate response time.

7. Social Commerce

Social media is an effective retail sales channel for making the most of mobile shopping. A study shows that mobile devices share **80% of social media** traffic. Furthermore, **79% of smart phone users** have made a purchase using their mobile devices.

Already a multibillion-dollar industry, social media commerce sales are expected to triple by 2025, reaching \$1.2 trillion. On top of that, global social network users surged **over the four billion mark** in 2021 and are projected to reach almost **six billion** in 2027.

8. Headless Commerce

Headless commerce is a next-generation eCommerce solution that decouples a website or application's front and back ends. Using application programming interfaces headless commerce can deliver content to any front-end framework.

With this architecture, e-Commerce shopping will not be limited to desktops, laptops, and mobile devices. Consumers can browse and purchase through internet of things devices such as smart speakers and smart fitness devices.

Advantages/disadvantages of e-commerce

ADVANTAGES OF E-COMMERCE

DISADVANTAGES OF E-COMMERCE

1. Increased reach: E-commerce allows businesses to reach customers across the globe, without the limitations of physical distance.

1. Cyber security risks: Online transactions can be vulnerable to hacking and other cyber security threats, putting customer data at risk.

2. Convenience: Online shopping allows customers to shop from the comfort of their own homes, saving time and effort.

2. Lack of personal interaction: E-commerce lacks the personal touch that brick-and-mortar stores offer, which can be a disadvantage for some customers.

3. Lower costs: E-commerce eliminates many of the costs associated with running a physical store, such as rent, utilities, and staffing.

3. Shipping costs: Customers may have to pay extra for shipping, which can be a disadvantage for those who are price-sensitive.

4. Increased sales: E-commerce can lead to increased sales by reaching a larger customer base and offering personalized recommendations.

4. Returns and refunds: Handling returns and refunds can be more complicated for e-commerce businesses, especially for products that are difficult to ship or require special handling.

ADVANTAGES OF E-COMMERCE

DISADVANTAGES OF E-COMMERCE

5. Data collection: E-commerce allows businesses to collect and analyze customer data, which can be used to improve marketing strategies and customer experiences.

5. Dependence on technology: E-commerce businesses rely heavily on technology, which can be a disadvantage if there are technical issues or system failures.

6. 24/7 availability: E-commerce allows businesses to be open 24/7, providing customers with the flexibility to shop at any time.

6. Lack of sensory experience: E-commerce lacks the sensory experience of physical stores, which can be a disadvantage for products that require sensory engagement, such as fragrances or food products.

7. Scalability: E-commerce businesses can easily scale up or down based on demand, without the constraints of physical space.

7. Customer service challenges: Providing excellent customer service can be a challenge for e-commerce businesses, especially when it comes to providing personalized support.

8. Reduced inventory costs: E-commerce businesses can reduce inventory costs by utilizing drop-shipping or other inventory management techniques.

8. Competition: E-commerce businesses face intense competition from other online retailers, which can be a disadvantage for smaller businesses.

ADVANTAGES OF E-COMMERCE

9. Increased customer loyalty: E-commerce businesses can increase customer loyalty by providing personalized recommendations and a seamless shopping experience.

10. Environmental benefits: E-commerce can be more environmentally friendly than traditional brick-and-mortar stores, by reducing the need for transportation and energy use.

DISADVANTAGES OF E-COMMERCE

9. Fraud and scams: E-commerce can be a breeding ground for fraud and scams, which can damage the reputation of businesses and deter customers.

10. Lack of immediate gratification: E-commerce typically involves a wait for shipping, which can be a disadvantage for customers who want immediate gratification.

Web auctions

- An online auction is an auction which is held over the internet.
- Web Auction is also called as e-Auction.
- An e-Auction is a transaction between sellers and bidders on goods or services online in an electronic marketplace.
- Bidders compete against one another, and the highest bidder receives the items for sale.
- Businesses may use this procurement method to purchase raw materials or components for their supply chain.
- Online auctions come in many different formats, but most popularly they are ascending English auctions, descending Dutch auctions, first-price sealed-bid, Vickrey auctions, or sometimes even a combination of multiple auctions, taking elements of one and forging them with another.

- Online auctions include business to business (B2B), business to consumer (B2C), and consumer to consumer (C2C) auctions.
- The largest online auction site is eBay, which was the first to support person-to-person transactions.
- Other popular examples of online auction sites include Web Store, Online Auction and Overstock.

Virtual communities



- Virtual Community is a social network of individuals who interact through specific social media, potentially crossing geographical and political boundaries in order to pursue mutual interests or goals.
- It is a community of people sharing common interests, videos, and feelings over the internet or other collaborative networks.
- One of its first proponents was “Howard Rheingold” who created one of the major internet communities called “The Well” in his book.
- The Vital aim of virtual community is to achieve socialization i.e. a person may be share his feelings, his opinion and his knowledge without any boundaries. As we know that the most popular communities of exchange view, ideas and achieve socialization is virtual community which consist of various online communities.

- This Type of communities is used for a variety of social and professional group.
- From this communities were promoted as the business model in E-business or E-Commerce.
- This type of Communities is still perfect place to listen to customers.

▪ A Virtual Community is a network which work within a social network of individual by any specific media and which have no limit about geographical area as well as political restriction.

▪ A virtual community is a group of people who share a common interest or goal and use the internet to exchange words and ideas through digital communication networks.

Portals

- Portals are online platforms that allow businesses to conduct interactions and transactions with customers and suppliers instantly, facilitating a more intuitive and connected operation.
 - Portals typically offer such services as Web searching, news, reference tools, access to online shopping venues, and communications capabilities including e-mail and chat rooms.
 - A web portal is a point of access in which the content is only available for a set of specific users.
 - It acts as a gateway to let users access the intended knowledge from a specified domain.
-
- **Ecommerce portals are online platforms where buyer-seller trading transactions are conducted. Manufacturers and distributors launch ecommerce portals to transit their buyers to an online channel. Portals streamline the buying process by facilitating bulk ordering and enabling volume-based pricing.**

Types of Web Portal



■ *Customer Portal*

- A customer portal refers to a self-service web platform that helps your customer with a single point of personalized access to organizational data that is applicable to them.
- This includes invoices, policies, orders, deliveries, and online payments.
- You can use customer portals 24/7, 365 days a year, on your desktop or mobile device.

■ *Education Portal*

- Education or student portals are specially designed websites that allows a host with various educational services.
- Educational Web Portals provide a variety of eBooks, articles, journals, research papers, online courses, and other educational resources.
- Providing a user-specific and personalized content are some of the core functionalities of the education portal.

▪ *Healthcare Portal*

- A healthcare portal, also known as the patient portal, is an online platform for your health care.
- The online web tools help track prescriptions, health care provider visits, test results, and billing.
- You can also seek information about health-related issues from a healthcare portal.

▪ *Community Portal*

- A community portal is a centralized online platform that engages with selected community members and generates powerful insights based on their opinions and feedback on a particular issue.
- You can achieve this by using several quantitative and qualitative market research methods across different websites, such as idea board, surveys, polls, discussions, and topics.

▪ *E-Commerce Portal*

- E-Commerce portals are business applications where buyers and sellers trade.
- Manufacturers and distributors launch commerce portals to route their buyers into an online channel.
- The web portals streamline the purchasing process by facilitating bulk orders and enabling volume-centric pricing depending on the business needs.

E-business revenue models

▪ *Revenue Model*

- A revenue model is the means by which a business plans to make money.
- Depending on the revenue model, which can be pretty standard or fairly complex, a company may take into consideration manufacturing, purchasing, distribution, fulfillment marketing, and other costs, until the business arrives at a profit.
- The revenue model is considered a high-level look at the revenue structure of a business.
- Within this model, a company can have a number of different revenue streams, i.e. different sources of income.

▪ Here's a look at five common e-Commerce revenue models that have proven to be highly successful over the years.

- **Sales Revenue Model**
- **Advertising Revenue Model**
- **Subscription Revenue Model**
- **Transaction Fee Revenue Model**
- **Affiliate Revenue Model**

▪ *Sales Revenue Model*

- The most common of all e-Commerce revenue models, here profits are achieved by selling products or providing services online versus, or in addition to, brick-and-mortar stores.
- Any business selling items through the internet, regardless of their business model, is following the sales revenue model.
- While they may have other revenue streams, this tends to be their bread-and-butter.

▪ *Advertising Revenue Model*

- Is Bob's Bait & Tackle ever going to get the type of traffic as, say, Facebook or Google? Of course not.
- But they can advertise on those sites! The advertising revenue model is when popular platforms allow others to advertise with them for a fee.
- Media sites, such as magazines, newspapers, and TV channels also frequently use this model.
- While they may charge a flat fee for advertising, generally cost is based on pay-per-click (PPC), which is the number of people who click on the ad.

▪ *Subscription Revenue Model*

- When it comes to the subscription revenue model, a lot of people think of Netflix or Spotify.
- However, there are also many popular [subscription box](#) brands like Bark Box, Hello Fresh, Ipsy, and Harry's.
- Regardless of the offering, with this model users are charged a recurring fee (monthly or annual) for using services or having existing products replenished and delivered regularly.
- Today, there are an estimated 7,000 subscription box services operating globally!

■ *Transaction Fee Revenue Model*

- This model charges a fee every time a transaction is made through their platform.
- For example, eBay charges sellers a fee whenever an item is sold; PayPal charges users a fee for transferring money; eTrade gains a transaction fee whenever a stock is sold; and so on.
- While fees tend to be minimal, if people are making thousands of transactions per day, the revenue can be substantial!

▪ *Affiliate Revenue Model*

- Last but not least is affiliate marketing.
- With this model, businesses earn revenue just by promoting and selling another person's (or company's) product on their site (as opposed to the advertising revenue model, which doesn't allow for purchase on the host's site).
- The concept of affiliate marketing is based on revenue sharing. If a business has a product and wants to earn more, you can promote complementary products or services of another company that will, in turn, pay you for your referrals.
- It's a win-win for both parties; the affiliate gains a new, passive revenue stream, and the merchant gains new customers.

THANK YOU



UNIT 2
SECURITY FOR E-BUSINESS

- Security Threats: An Area View
- Implementing E-commerce security
- Encryption
- Decryption
- Protecting client computers
- E-commerce communication channels and web servers encryption
- SSL protocol
- Firewalls
- Cryptography methods
- VPNs
- Protecting networks, policies and procedures

Security Threats



- The threat is not a security problem that exists in an implementation or organization. Instead it is something that can violate the security.

- *Security Threat means any threat or connected series of threats to commit an intentional attack against a Computer System for the purpose of demanding money, securities or other tangible or intangible property of value from an Insured.*

- E-commerce threat is occurring by using the internet for unfair means with the intention of stealing and fraud.

- There are various types of e-commerce threats.

- Some are accidental, some are purposeful, and some of them are due to human error.

- E-commerce security threats cost online retailers billions of dollars annually and can be devastating enough to shut down online stores.
- Although many stores take security threats in e-commerce seriously, more can be done to protect your business and your customers from online attacks.
- E-commerce attacks can come in many forms that can disrupt your ecommerce platform and your customers' accounts and data. Earning the trust of your customers requires a consistent awareness of the evolving types of fraud and cyber attacks to help you ensure solutions are in place across your sales funnel.

Types of Security Threats in E-Commerce



1. Financial fraud

- Financial fraud takes several forms.
- It involves hackers gaining access to your customer's personal information or payment information, then selling that information on the black market.
- It also involves fraudsters using stolen credit card information to make illegitimate purchases from your e-commerce store.

- When a cybercriminal uses stolen credit card information (and a stolen identity) to make a purchase in your e-commerce store, it is e-commerce fraud.
- Unfortunately in such cases, the e-commerce business ends up absorbing the cost of the fraud, which affects revenue.
- A unique characteristic of online card fraud (involving stolen credit card information) is that the card does *not* need to be present for the transaction to go through.
- Instead, the fraudster will simply enter the stolen credit card information (name, billing address, card number, expiry date, and CVV number), and the e-commerce store treats it as a valid transaction.

2. Phishing

- Your customers are the target in a phishing scam, where a fraudster **sends messages or emails** pretending to be you with the goal of obtaining their private information.
- These messages may contain logos, URLs, and other information that appears to be legitimate, but it won't be you sending it.
- They'll ask customers to verify their account by logging in and then use the information to steal personal data.

- Phishing is a type of social engineering attack often used to steal user data, including login credentials and credit card numbers.
- It occurs when an attacker, masquerading as a trusted entity, dupes a victim into opening an email, instant message, or text message.
- An attack can have devastating results. For individuals, this includes unauthorized purchases, the stealing of funds, or identify theft.

3. Spamming

- In an attempt to obtain personal information or to affect your website's performance spammers may leave **infected links** in their comments or messages on your website, such as on blog posts or contact forms.
- If you click on the links, they can take you to a spam website that exposes you to malware.

- Spamming (especially e-mail spam) is very common because of the economics.
- Spam advertisers have little to no operating costs and so need only a minute response rate to make a profit.
- Most spam are commercial advertising, but some contain viruses, adware, or scams.

4. Malware

- Malware refers to malicious programs such as spyware, **viruses**, Trojan horses, and Ransomware.
- Hackers install it on your computer system and spread it to your customers and administrators, where it might swipe sensitive data on their systems and from your website.

Type	What It Does
Ransomware	Disables victim's access to data until ransom is paid
Fileless Malware	Makes changes to files that are native to the OS
Spyware	Collects user activity data without their knowledge
Adware	Serves unwanted advertisements
Trojans	Disguises itself as desirable code
Worms	Spreads through a network by replicating itself
Roolkits	Gives hackers remote control of a victim's device
Keyloggers	Monitors users' keystrokes
Bots	Launches a broad flood of attacks
Mobile Malware	Infects mobile devices
Wiper Malware	Erases user data beyond recoverability.

5. Bad bots

- Bad bots are **computer programs** designed to carry out harmful actions such as stealing website content, account hacking, and DDoS attacks.
- Bot means **anonymous program**.
- People are generally aware that bots are all over the Internet, obtaining information about our habits and behaviors.
- Your **competition**, however, could use bots to gather information about your inventory and prices.
- They then use that information to change their prices.

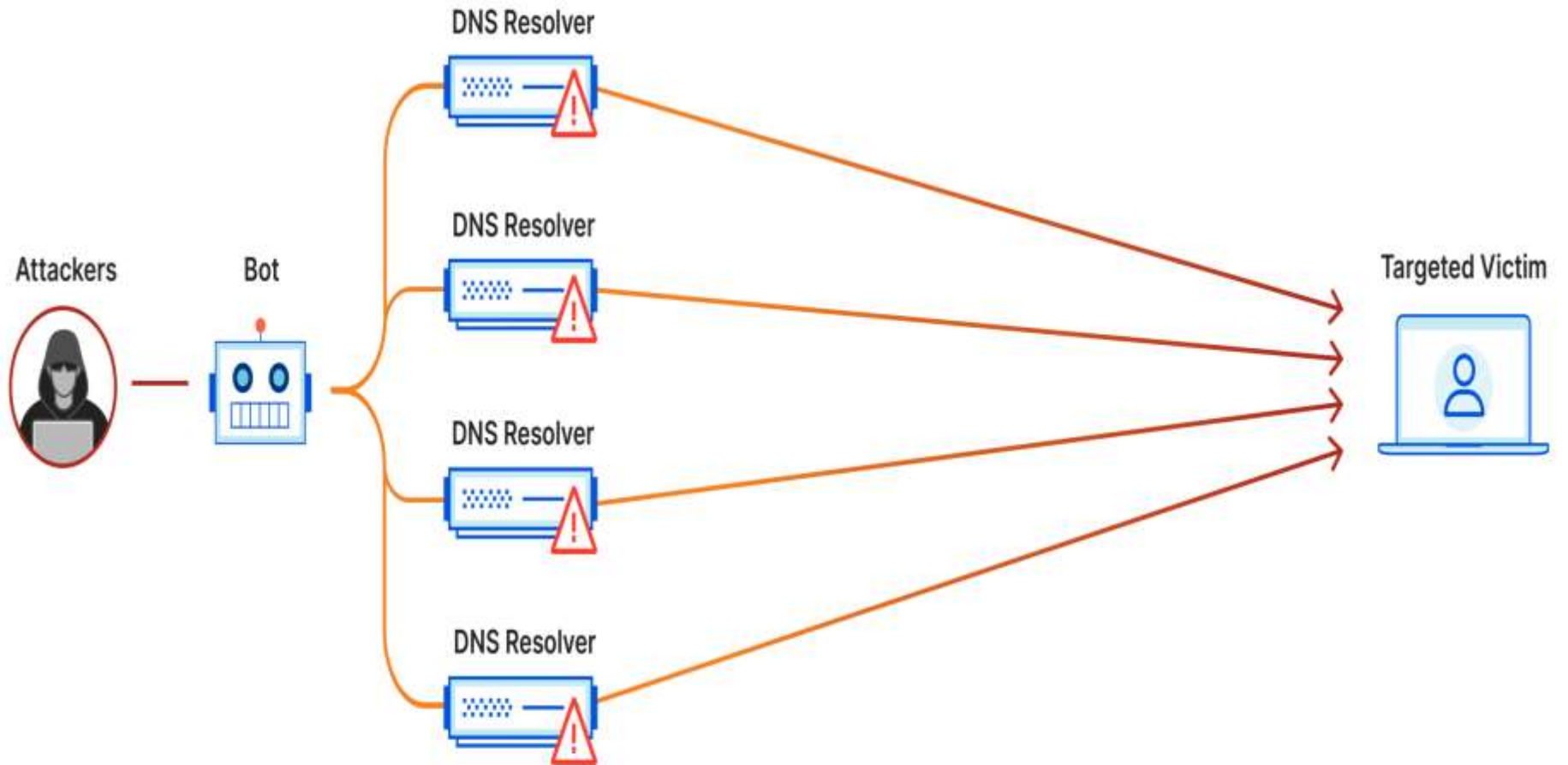
Or hackers can send malicious bots to e-commerce checkout pages to buy large amounts of a product and scalp it for up to 10 times the list price.

How do botnets work?

Malicious actors can manipulate bots remotely, corrupting a large number of internet-connected devices after infecting them with malware. What makes this especially alarming is that the owner of the compromised device may not be aware that their device has been infected.

6. Distributed denial of service (DDoS) attacks

- Distributed denial of service attacks happens when your servers receive an overwhelming amount of **requests from various IP addresses**—usually untraceable—that cause your server to crash.
- That means your e-commerce store isn't available to visitors, which disrupts your sales.



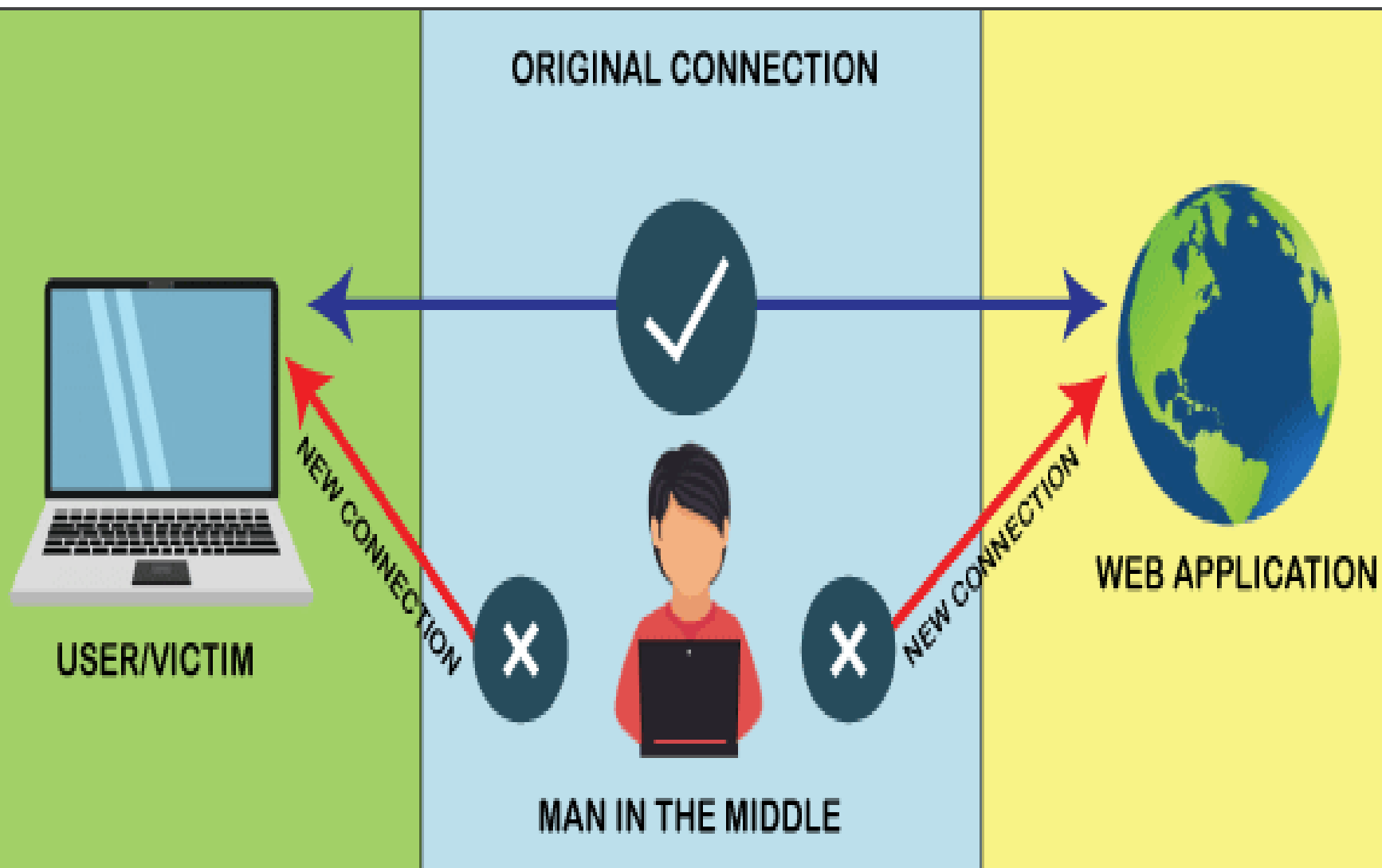
7. Fake return and refund fraud

- Fraudsters can obtain money from you by committing **fake returns and refund fraud** in many ways.
- Some use a stolen credit card to purchase merchandise, then claim that the card is closed and request a refund to another card. Others use counterfeit receipts to request refunds for items they haven't purchased.

8. Man-in-the-middle attacks

- With technology evolving, so are hackers' schemes.
- Man-in-the-middle attacks allow the hacker to listen in on the communications of e-commerce website users.
- These users are tricked into using a public wireless network, enabling hackers to access their devices and see their browsing history.
- They can also access credit card information, passwords, and usernames.

HOW MAN IN THE MIDDLE ATTACKS WORK



Implementing E-commerce security

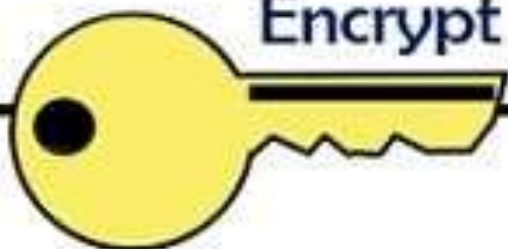
Encryption and Decryption

- **Encryption** is the process by which a readable message is converted to an unreadable form to prevent unauthorized parties from reading it.
- **Decryption** is the process of converting an encrypted message back to its original (readable) format.
 - The original message is called the **plaintext message**.
 - The encrypted message is called the **ciphertext message**.

Encryption is the process of converting normal message (plaintext) into meaningless message (Ciphertext).
Whereas Decryption is the process of converting meaningless message (Ciphertext) into its original form (Plaintext).

Plain text:
**Your password is
unitedkingdom**

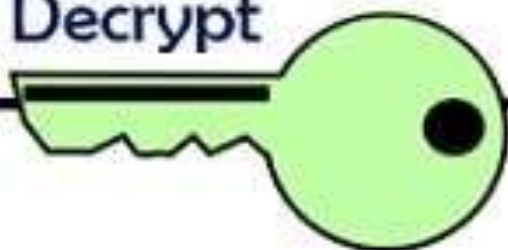
Encrypt



Cipher text:
**12dz\$6c70f2zx
*83\$nxfsImw8kg4
2m**

Plain text:
**Your password is
unitedkingdom**

Decrypt



Process of Encryption and Decryption

SL. NO	ENCRYPTION	DECRYPTION
1.	Encryption is the process of converting normal message into meaningless message.	While decryption is the process of converting meaningless message into its original form.
2.	Encryption is the process which take place at sender's end.	While decryption is the process which take place at receiver's end.
3.	Its major task is to convert the plain text into cipher text.	While its main task is to convert the cipher text into plain text.
4.	Any message can be encrypted with either secret key or public key.	Whereas the encrypted message can be decrypted with either secret key or private key.

SL. NO	ENCRYPTION	DECRYPTION
5.	In encryption process, sender sends the data to receiver after encrypted it.	Whereas in decryption process, receiver receives the information(Cipher text) and convert into plain text.
6.	The same algorithm with the same key is used for the encryption-decryption process.	The only single algorithm is used for encryption-decryption with a pair of keys where each use for encryption and decryption.
7.	Encryption is used to protect the confidentiality of data by converting it into an unreadable form that can only be read by authorized parties.	Decryption is used to reverse the encryption process and convert the ciphertext back into plaintext.
8.	The output of encryption is a ciphertext that is unintelligible to anyone who does not have the decryption key.	The output of decryption is the original plaintext message.

Protecting client computers

- E-Commerce security is the guideline that ensures safe transactions through the internet. It consists of protocols that safeguard people who engage in online selling and buying goods and services.
- The various E-commerce website security measures to cover you 24/7 are as follows,

1. Use Multi-Layer Security

It is helpful to employ various security layers to fortify your security. A Content Delivery Network (CDN) that is widespread can block DDoS threats and infectious incoming traffic. They use machine learning to keep malicious traffic at bay.

You can go ahead and squeeze in an extra security layer, such as Multi-Factor Authentication.

A two-factor authentication is a good example. After the user enters the login information, they instantly receive an SMS or email for further actions. By implementing this step, it blocks fraudsters as they will require more than just usernames and passwords to access the legit users' accounts.

[Username
& password]

[Multi-factor
Authentication]

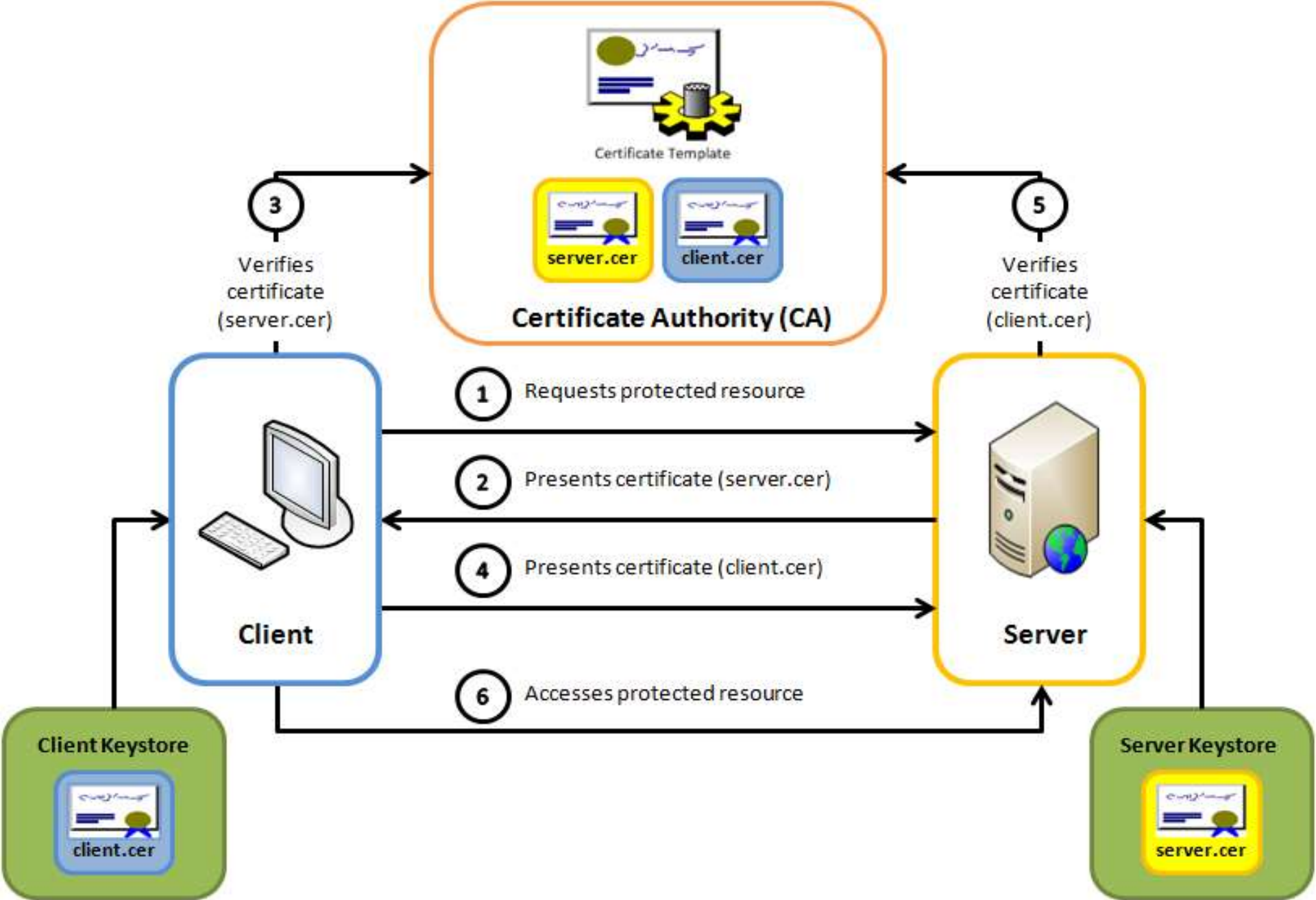


[Logged in]

2. Get Secure Server Layer (SSL) Certificates

One of the primary benefits of SSL is to encrypt sensitive data shared across the internet. It ensures that the information reaches only the intended person. It is a very crucial step because all data sent will pass through multiple computers before the destination server receives it.

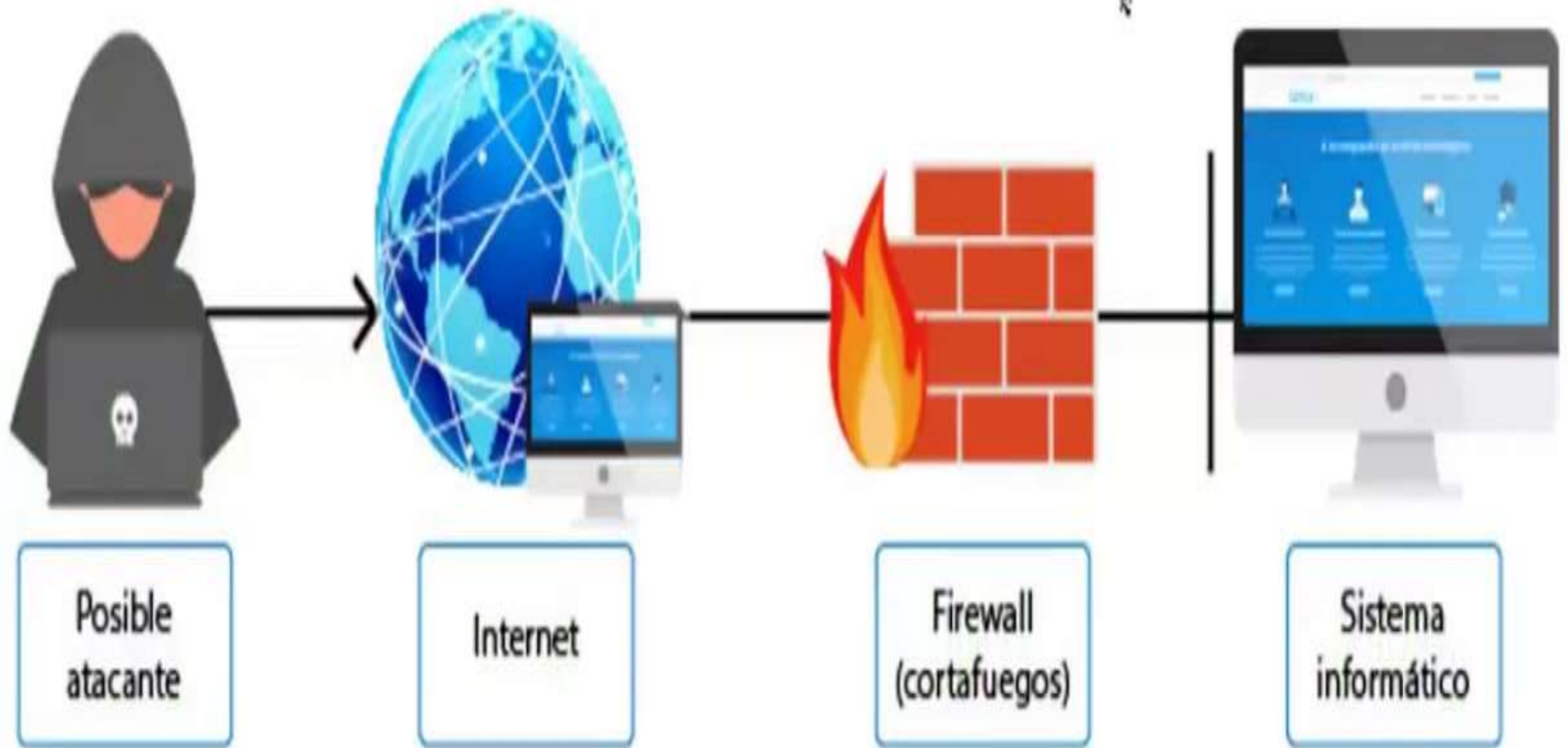
If SSL certificate encryption is absent, any electronic device between the sender and the server can access sensitive details. Hackers can thus take advantage of your exposed passwords, usernames, credit card numbers, and other information. Therefore, the SSL certificate will come to your aid by making the data unreadable to unintended users.



Mutual SSL authentication / Certificate based mutual authentication

3. Use solid-rock Firewalls

Use effective e-commerce software and plugins to bar un-trusted networks and regulate the inflow and outflow of website traffic. They should provide selective permeability, only permitting trusted traffic to go through.



Posible atacante

Internet

Firewall
(cortafuegos)

Sistema informático

4. Anti-Malware Software

Your electronic devices, computer systems, and web system need a program or software that detects and block malicious software, otherwise known as malware. Such protective software is called Anti-malware software. An effective anti-malware should render all the hidden malware on your website.

One such scanner is the Astra Malware Scanner. It scans your web system for all malicious software round the clock and is at your disposal It also lets you automate your scans with its "Schedule a Scan" feature. You can schedule the scans daily, weekly, monthly or fortnightly.

 General Settings Malware Exclusions Web Exclusions Detection and Protection Update Settings History Settings Access Policies Advanced Settings Automated Scheduling About

Detection and Protection

Customize detection and protection behavior for Malwarebytes Anti-Malware. These settings are recommended for advanced users.



Recommended Settings

Detection Options

- Use Advanced Heuristics Engine (Shuriken)
- Scan for rootkits
- Scan within archives

Non-Malware Protection

PUP (Potentially Unwanted Program) detections:

Treat detections as malware

PUM (Potentially Unwanted Modification) detections:

Treat detections as malware

Malware Protection

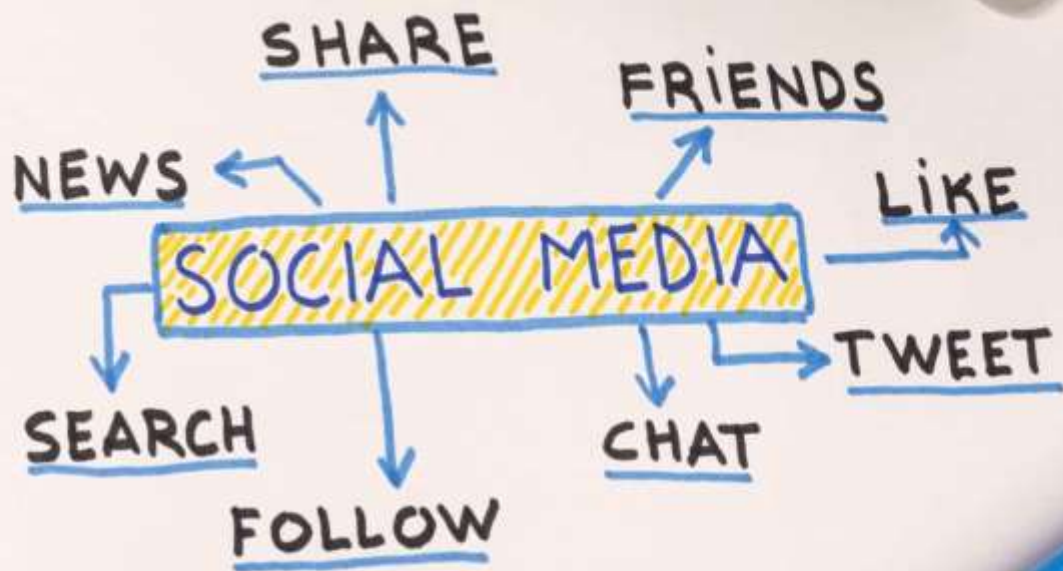
Enabled Disabled

Malicious Website Protection

Enabled Disabled

*E-commerce
communication channels*

- If you have an online business, it is important to connect with your target audience. To be successful you must have a good communication strategy.
- Certainly, there are many different channels you can use to reach your customers, and each has its own advantages.
- Using more than one customer communication channel is key to the success of your business.
- **Communication channels** are the means by which companies can build a solid customer base and build brand loyalty.
- For this reason, the most important factor to consider when choosing communication channels is their ability to meet the needs of your **target audience**.



Social media

Social networks are a powerful communication tool that can help you reach a large audience with minimal effort.

In addition, we know that many people start their online sales ventures through Instagram and Facebook.



Email

So, did you know that email remains one of the most effective customer communication channels? Yes, especially when it comes to building relationships with customers. After all, you can use email to:

Send newsletters.

Share content to generate traffic to your website.

Special offers.

Important updates about your product or service.

Moreover, a common mistake of new entrepreneurs is to think that using email is an old-fashioned way, but the truth is that according to a Hub-Spot survey in 2021, email marketing campaigns increase revenue by 760%.



LiveChat

Live Chat

Live chat is a form of customer support that allows you to quickly and easily resolve customer issues as they arise. It is a great way to offer customer support and answer questions people may have about your products.

It is considered as the best customer communication channel for e-commerce if you need to improve the overall customer experience, as it allows you to solve their problems quickly and efficiently.

In addition, live chat can be used to up-sell or cross-sell products and services, which can increase sales. And finally, live chat can reduce the costs associated with customer service.



Hello



Hello. Can I help you?



I looking for some thing.

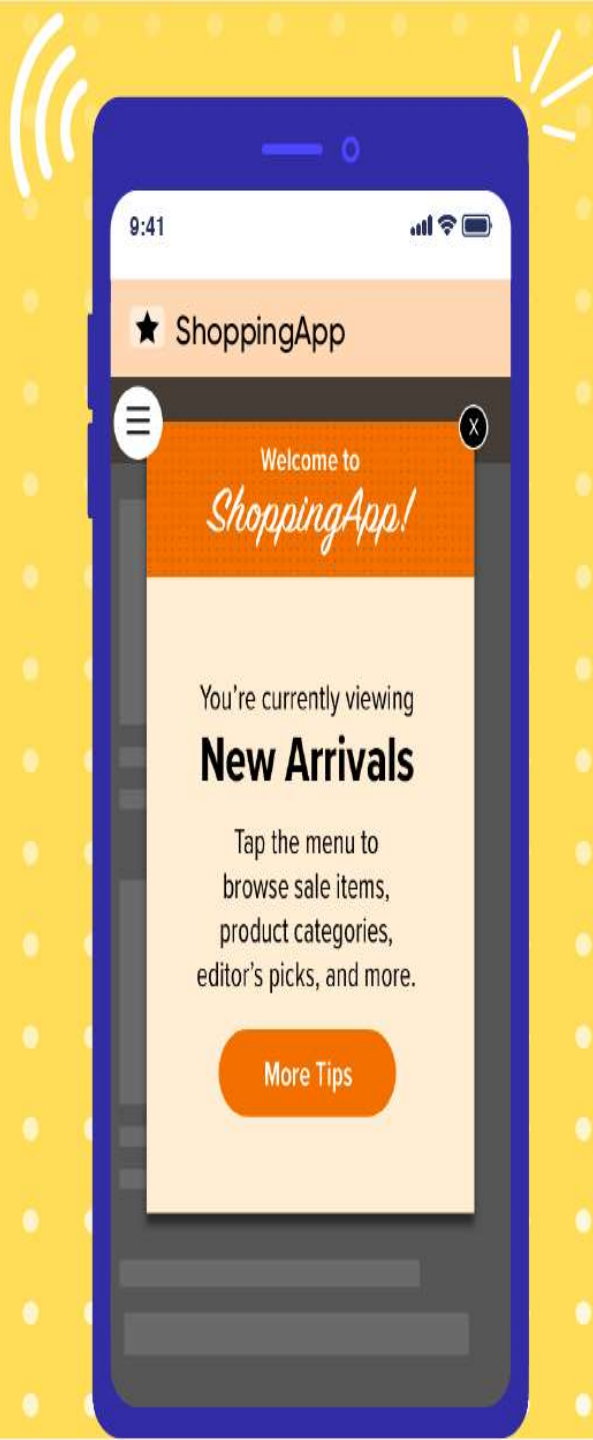


What product are you searching for?

Chatbots

Chatbots are a great way to provide customer service and answer any questions your customers may have. They can also be used to promote new products and special offers.

The chatbot can be configured to answer your users' most frequently asked questions. As a result, not only will you keep your clients satisfied, but you will be able to reduce repetitive tasks and invest time in more relevant ones.



9:41



★ ShoppingApp



Welcome to
ShoppingApp!

You're currently viewing
New Arrivals

Tap the menu to
browse sale items,
product categories,
editor's picks, and more.

More Tips

In-app messaging

In-app messages are a great way to reach your customers while they are using your app. They can be used to promote new products, special offers, or just to keep them updated about what is going on with your company.

They are a very direct way to reach your clients as soon as they open your App and can help you get leads faster.

6:47

LTE 



Macy's >

Macy's: Today only! Flash Sale:
40-60% off work looks that
mean business. Shop now:
<https://mcys.co/37wSxBM> Txt
STOP=End.

SMS Marketing

SMS marketing is a great way to reach customers who may not be checking their email regularly. It's also a way to send time-sensitive information such as special offers or sales alerts.

To get started with SMS marketing, businesses should identify their **target audience** and create a list of phone numbers. It is an effective way to reach your clientele and can be used in conjunction with other customer communication channels, such as social media or email marketing, for greater effectiveness.

Web Servers Encryption

- A web browser is basically the software that we use for browsing on the internet and displaying pages.
- Conversely, a web server refers to the software that provides its users with the documents they request via their web browsers.

- When a browser receives an instruction to access a web page, it parcels this instruction using the TCP (Transmission Control Protocol).
- The job of TCP is to ensure the correct sequence of transmission of a message and its correct unpacking at the destination/ receiver.

- Web Browsers are application programs.
- They display a www document, and they usually access the document using other internet services.
- On the other hand, web servers are computers or programs that can easily provide various services to clients (other programs).
- The browser requests for services and documents, and the server displays the web content.
- Here, the browser acts as a bridge or an interface between the server and the client.

```
graph TD; Browser[Web Browser] -- "Web browser Request the Web server" --> Server[Web Server]; Server -- "Web server Serves the Web page" --> Browser;
```

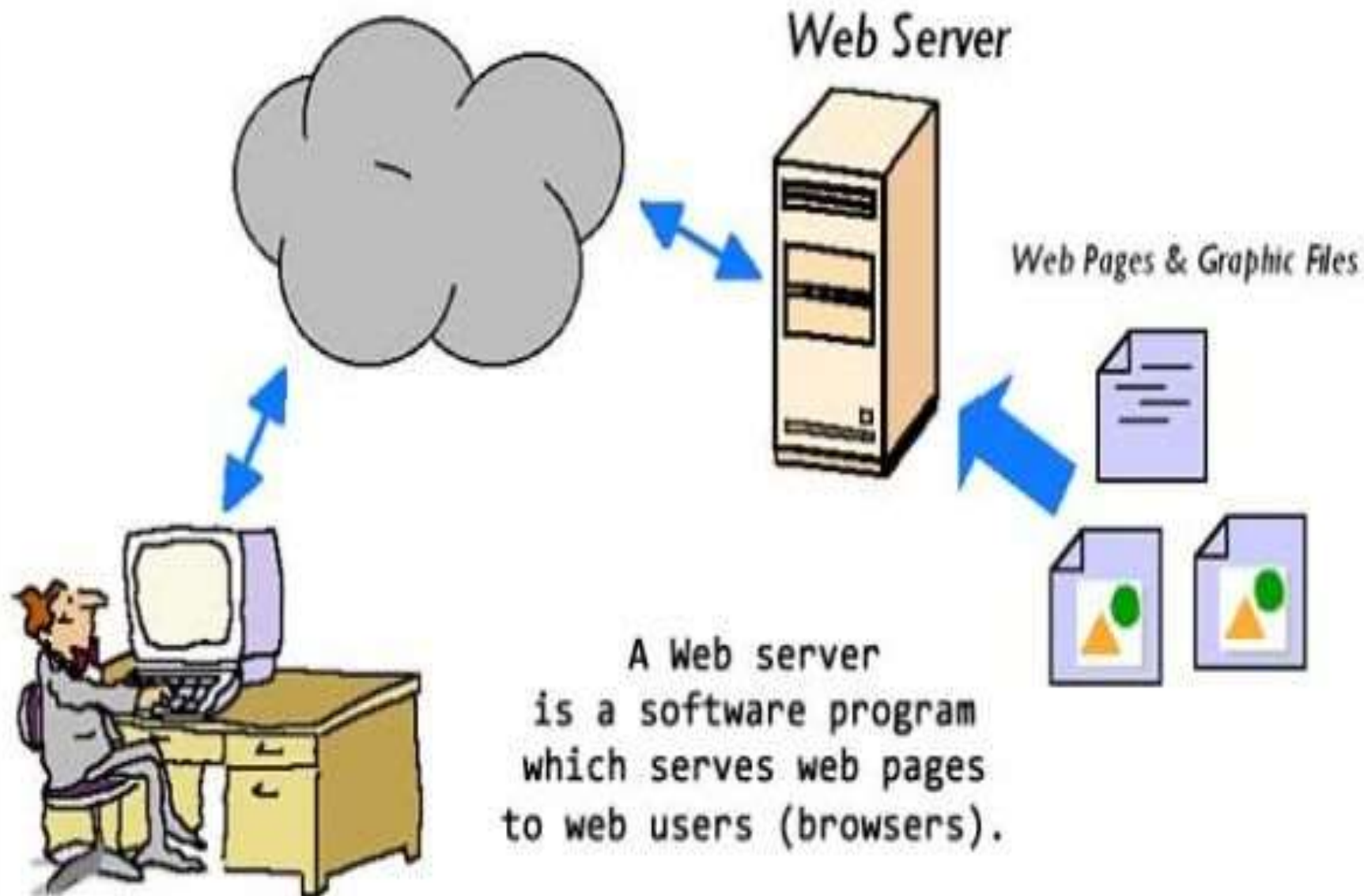
Web Server

Web browser
Request the
Web server

Web server
Serves the
Web page

Web Browser

A **web browser** is an application software which is used to browse and display web pages available over the Internet, whereas a **web server** is a software hosted on a dedicated computer which provides these documents when requested by web browsers.



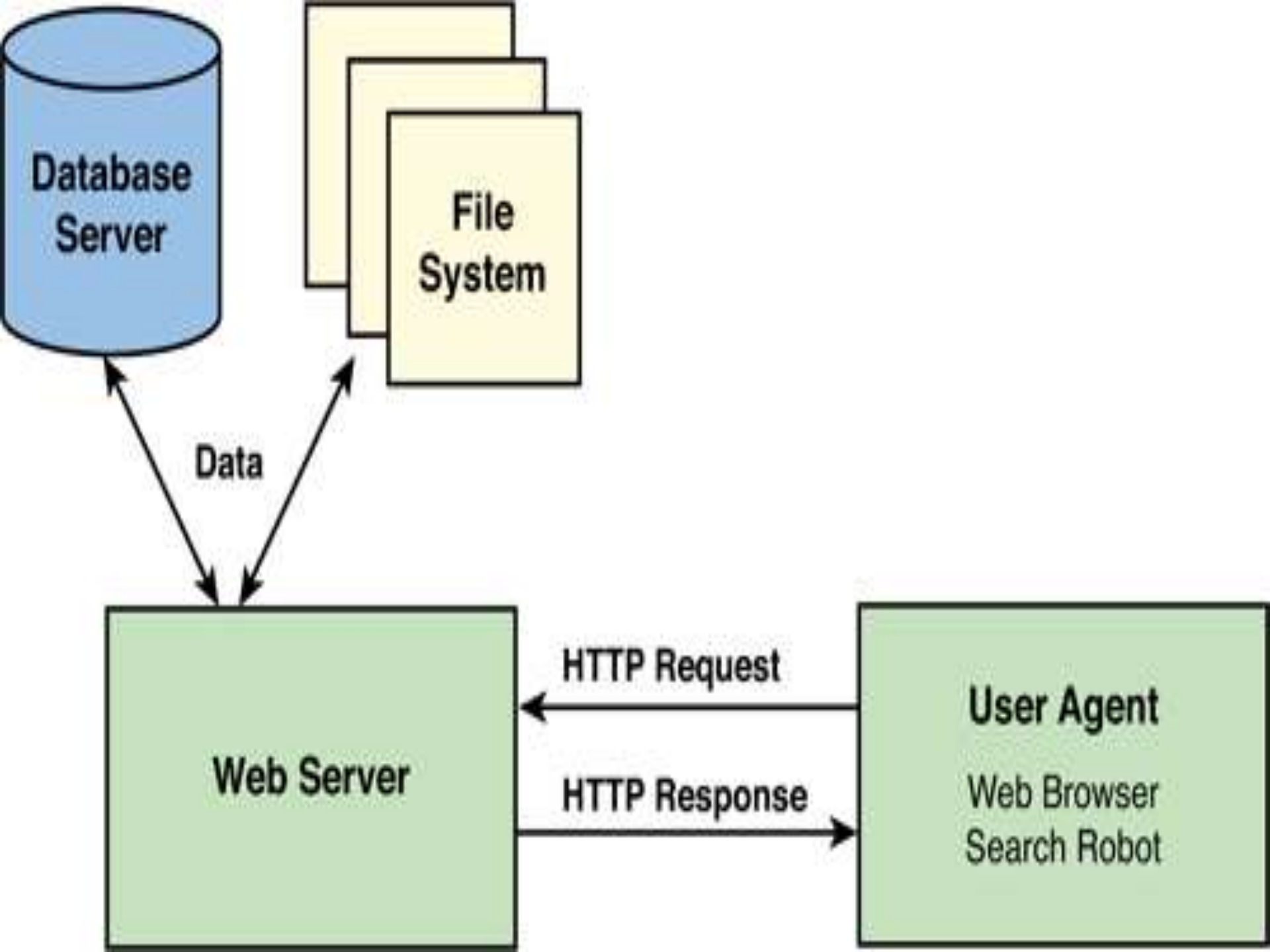
Web Servers Encryption

- People encounter encryption every day, whether they know it or not.
- Encryption is used for securing devices such as smart phones and personal computers, for protecting financial transactions such as making a bank deposit and buying an item from an online retailer, and for making sure messages such as email and texts are private.
- If you've ever noticed that a website's address starts with "https://" (the "s" means "secure") it means that the website is using transport encryption.

- Hypertext transfer protocol secure (HTTPS) is the primary protocol used to send data between a web browser and a website.
- HTTPS is a secure way to send data between a web server and a web browser.
- HTTPS is encrypted in order to increase security of data transfer.
- This is particularly important when users transmit sensitive data, such as by logging into a bank account, email service, or health insurance provider.
- Any website, especially those that require login credentials, should use HTTPS.
- In modern web browsers such as Chrome, websites that do not use HTTPS are marked differently than those that are.
- Look for a padlock in the URL bar to signify the webpage is secure.

- In websites without HTTPS, it is possible for Internet service providers (ISPs) or other intermediaries to inject content into web pages without the approval of the website owner.
- This commonly takes the form of advertising, where an ISP looking to increase revenue injects paid advertising into the web pages of their customers.
- Unsurprisingly, when this occurs, the profits for the advertisements and the quality control of those advertisements are in no way shared with the website owner.
- HTTPS eliminates the ability of unmoderated third parties to inject advertising into web content

- At its most basic level, encryption is the process of protecting information or data by using mathematical models to scramble it in such a way that only the parties who have the key to unscramble it can access it.
- Encryption is used to protect data from being stolen, changed, or compromised and works by scrambling data into a secret code that can only be unlocked with a unique digital key.



Encryption performs four important functions:

Confidentiality: keeps the contents of the data secret

Integrity: verifies the origin of the message or data

Authentication: validates that the content of the message or data has not been altered since it was sent

Non-repudiation: prevents the sender of the data or message from denying they were the origin

SSL protocol

- The Secure Sockets Layer (SSL) protocol was developed by Netscape Communications Corporation.
- SSL ensures the data that is transferred between a client and a server remains private.
- This protocol enables the client to authenticate the identity of the server.
- An SSL certificate is a digital certificate that authenticates a website's identity and enables an encrypted connection.
- SSL stands for Secure Sockets Layer, a security protocol that creates an encrypted link between a web server and a web browser.
- Companies and organizations need to add SSL certificates to their websites to secure online transactions and keep customer information private and secure.
- SSL keeps internet connections secure and prevents criminals from reading or modifying information transferred between two systems.



Firewalls

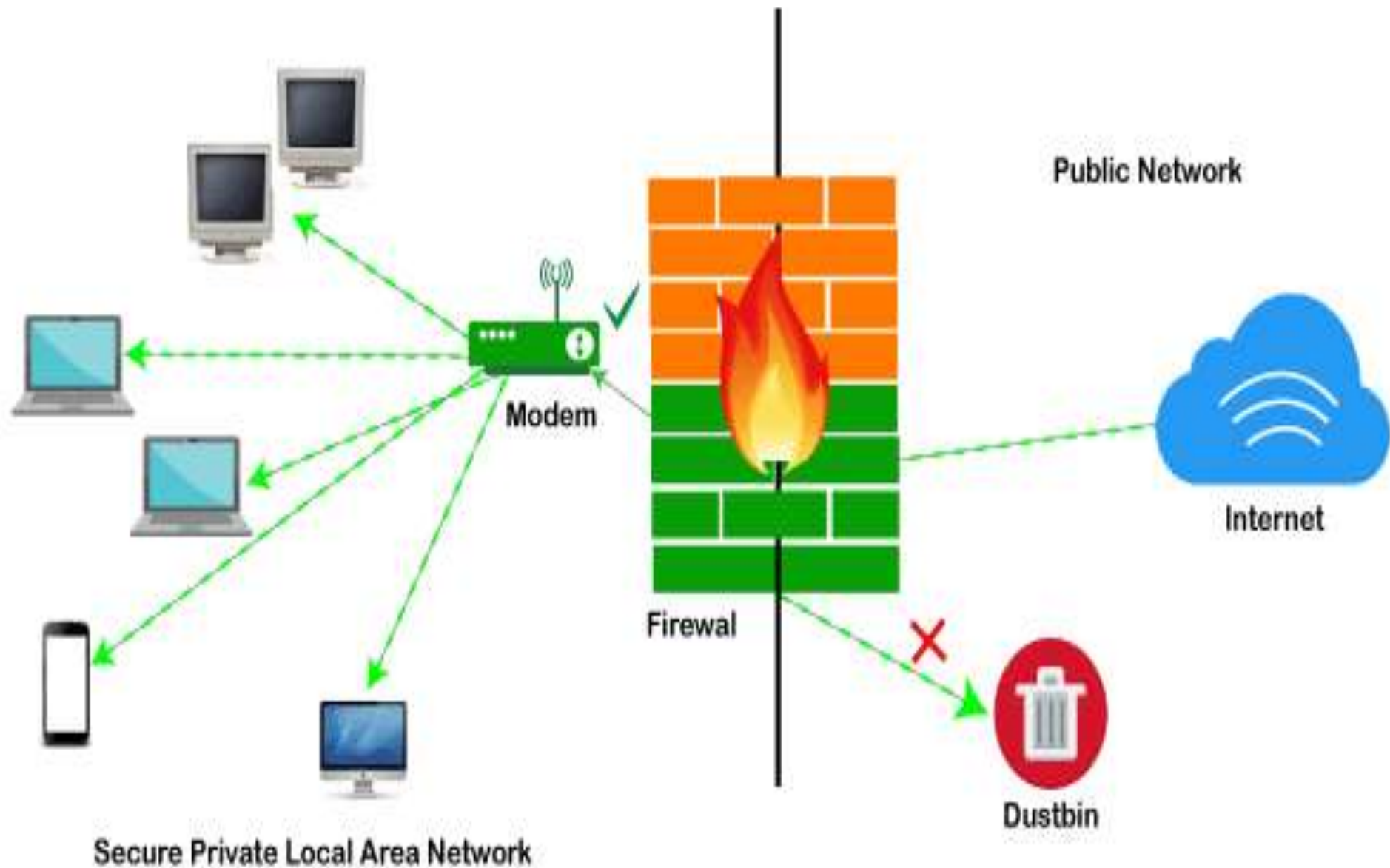
▪ A firewall is a network security device, either hardware or software-based, which monitors all incoming and outgoing traffic and based on a defined set of security rules it accepts, rejects or drops that specific traffic.

▪ **Accept** : allow the traffic

▪ **Reject** : block the traffic but reply with an "unreachable error"

▪ **Drop** : block the traffic with no reply

▪ A firewall establishes a barrier between secured internal networks and outside untrusted network, such as the Internet.



✓ =Specified Traffic Allowed
✗ =Restricted Unknown Traffic

Cryptography



Cryptography



- Cryptography is associated with the process of converting ordinary plain text into unintelligible text and vice-versa.
- It is a method of storing and transmitting data in a particular form so that only those for whom it is intended can read and process it.
- Cryptography not only protects data from theft or alteration, but can also be used for user authentication.

➤ Modern cryptography concerns with:

- Confidentiality - Information cannot be understood by anyone.
- Integrity - Information cannot be altered.
- Non-repudiation - Sender cannot deny his/her intentions in the transmission of the information at a later stage
- Authentication - Sender and receiver can confirm each.

Symmetric Cryptography

- In symmetric key cryptography, an **individual key** is used for both encryption and decryption.
- The sender needs the key to encrypt the plaintext and sends the cipher document to the receiver.
- The receiver use the similar key (or rule set) to decrypt the message and recover the plaintext.
- Because an individual key is used for both functions, symmetric key cryptography is also known as **symmetric encryption**.

- It is also called as "Private-key Cryptography".
- Symmetric key cryptography schemes are usually categorized such as stream ciphers or block ciphers.
- Stream ciphers works on a single bit (byte or computer word) at a time and execute some form of feedback structure so that the key is constantly changing.

Asymmetric cryptography

- Asymmetric cryptography uses **two keys** for encryption and decryption. It depends on the technique of **public and private keys**.
- A public key, which is interchanged between higher than one user.
- Data is **decrypted** by a **private key**, which is not transformed.
- It is slower but more secure.
- The **public key** used in this **encryption** technique is applicable to everyone, but the private key used in it is not revealed.

- This is also called as "Public Key Cryptography".
- In asymmetric encryption, a message that is encrypted utilizing a public key can be decrypted by a private key, while if the message is encrypted by a private key can be decrypted by utilizing the public key.
- Asymmetric encryption is broadly used in day-to-day communication channels, particularly on the internet.

Symmetric Key Cryptography

There is only one key (symmetric key) is used, and the similar key can be used to encrypt and decrypt the message.

It is effective as this technique is recommended for high amounts of text.

Symmetric encryption is generally used to transmit bulk information.

Asymmetric Key Cryptography

There are two different cryptographic keys (asymmetric keys), known as the public and the private keys, are used for encryption and decryption.

It is inefficient as this approach is used only for short messages.

It is generally used in smaller transactions. It is used for making a secure connection channel before transferring the actual information.

Symmetric Key Cryptography

Asymmetric Key Cryptography

Symmetric key cryptography is also known as secret-key cryptography or private key cryptography.

Asymmetric key cryptography is also known as public-key cryptography or a conventional cryptographic system.

Symmetric key cryptography uses fewer resources as compared to asymmetric key cryptography.

Asymmetric key cryptography uses more resources as compared to symmetric key cryptography.

The length of the keys used is frequently 128 or 256 bits, based on the security need.

The length of the keys is much higher, such as the recommended key size is 2048 bits or higher.

Virtual Private Networks (VPNs)

- A virtual private network, or VPN, is an encrypted connection over the Internet from a device to a network.
- The encrypted connection helps ensure that sensitive data is safely transmitted.
- VPN technology is widely used in corporate environments.
- A VPN extends a corporate network through encrypted connections made over the Internet. Because the traffic is encrypted between the device and the network, traffic remains private as it travels.
- An employee can work outside the office and still securely connect to the corporate network. Even smart phones and tablets can connect through a VPN.

Advantages of VPN

- Reduced costs
- Improved security
- Better performance
- Improved scalability
- Flexibility and reliability
- Greater access to mobile users
- Cost efficiency

Disadvantages of VPN

- Slower speed
- Cost
- Logging policies
- Technical difficulties
- Trust issues

Thank you

UNIT 3

E-PAYMENTS

- E-payment systems – An overview
 - B to C payments
 - B to B payments
- Types of E- payment system
 - Credit card payment
 - Debit cards
 - Accumulating balance
 - Online stored value payment systems
 - Digital cash
 - Digital (electronic) wallets
 - Agile wallet
 - Smart cards and digital cheques
- Secure Electronic Transaction (SET) protocol

Introduction

- Electronic Payments entail the transfer of funds through electronic or digital mediums.
- E-payments are quick and efficient, and the fund transfer typically takes place instantly.
- It is a secure mode of making payments.
- E-payments eliminate the need for cash payments, and funds are transferred directly into mobile wallets or bank accounts linked to the mobile number.
- With the banking and tech industry achieving one milestone of convenience after another, the way we make payments has been revolutionized.
- It has been established that cash is no longer the kind and that people prefer to have various, internet-enabled alternative payment methods.
- One such method of making payments is known as electronic or e-payments.

- E-payments are an electronic or digital way of transferring funds. Essentially, you can utilize electronic payment methods to transfer funds as an alternative to cash payments.
- The various types of e-payment include credit card, debit cards, mobile wallets, UPI, internet and mobile banking, and many more.
- You simply require a bank account and an internet-enabled device to leverage e-payment solutions and pay for various products and services.

■ The various advantages are,

1. Instant Payment
2. Higher payment security
3. Better customer convenience
4. Low risk of theft
5. Contactless
6. Time-Saving
7. Cashless Economy
8. Certainty

B2B payments

- B2B is the fastest growing sector of E-commerce payment.
- It is generally used in commercial payments.
- It is also called as retain payment.
- The seller company is paid directly by buyer's company for goods and services.
- These payments are much larger than B2C.
- It involves complex business accounting system.
- It requires numerous documents to accomplish the transactions.
- It involves legally binding contracts among partners.
- It reduces the credit risk.
- It provides reports of goods delivery, invoices, collection, etc.,.

B2C payments

- It is used in commercial activities.
- The buyer pays directly to merchant for goods and services.
- It is also called as retail payment.
- It is generally used in small to medium sized enterprises.
- It may be a purchase of single book online.
- It also involves the payment of wages, salaries from employers to employees or even pensions from government.
- It involves the online payment by any potential customer to company.
- It does not involve pre-existing relationship.

Types of E- payment system

Credit card payment

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- **The card holder** – Customer
- **The merchant** – seller of product who can accept credit card payments.
- **The card issuer bank** – card holder's bank
- **The acquirer bank** – the merchant's bank
- **The card brand** – for example , visa or Mastercard.

Types of Credit Card Payment Systems

Three types of credit card payment systems are widely available to merchants.

- Standalone terminals
- Cell phone processing solutions
- Virtual terminals

These payment systems allow merchants to process a variety of transactions, such as credit card and gift card payments. Customers are more likely to shop from a merchant if they offer a variety of payment options at checkout.

□ Standalone Terminals

Standalone terminals are the type seen at retail stores. The customer, or the merchant, slides the card through a magnetic strip reader. The information is then sent to the credit card processor and is either accepted or declined. Accepted transactions are credited to the merchant's account at the time of sale.

The standalone terminal payment system transmits information in a variety of ways. Transmission is via a phone line or high-speed cable system, using ethernet wiring.

□ Cellphone Processing Solutions

Businesses that need to operate on the road, such as delivery drivers or antique dealers, can accept credit cards using mobile technology. Cellphone payment systems utilize Wireless Application Protocol (WAP) technology. WAP-enabled phones send credit card information to the processor. Cellphone systems depend on the availability of a satellite connection.

Merchants who operate in rural or mountainous areas may experience difficulty using cellphone processing, due to signal interference.

□ Virtual Terminals

Virtual terminals are designed to process online credit and debit cards payments. Virtual terminals are very useful for recurring payments, such as monthly installments or membership fees. The virtual terminal payment system is also a mobile system, it can be used anywhere there is an Internet connection. Merchants benefiting from a virtual terminal, include merchants that operate online auction sites, sales via a Web site or who charge recurring fees.

Debit cards

- Debit cards are payment cards that reduce the need to carry cash or physical cheques to make purchases.
- You can use debit cards at ATMs to withdraw cash.
- Debit card purchases may require a personal identification number (PIN), but some purchases can be made without one.
- You may be charged an ATM transaction fee if you use your debit card to withdraw cash from an ATM that's not affiliated with your bank.
- Some debit cards offer rewards, similar to credit card rewards, such as 1% back on purchases.

- Debit cards usually have daily purchase limits, meaning you can't spend more than a certain amount in one 24-hour period.
- Debit cards blend the basic functions of an ATM card and a credit card to help consumers quickly access cash from their bank accounts.
- You can use a debit card for online purchases, at the cash register or even in a mobile wallet app to pay instead of writing a check.

There are four commonly used types of debit cards in India

- 1) Visa debit cards
- 2) Master card debit card
- 3) RuPay debit cards
- 4) Contactless debit cards.

1) Visa debit cards

Visa debit cards are issued by banks in association with Visa Inc, which is an American multinational financial services company. This is the most globally accepted cards to make online and offline electronic payment transactions. These cards use the Visa payments gateway which comes with their high security and 24x7 assistance. Visa debit cards come in varieties like Classic, Gold, Platinum,etc which are customized with benefits based on the type of bank accounts the customers hold.

2) Master card debit card

Just like Visa, Master card is a popular American payments company which is accepted even at some foreign online retailers . The company is known for its fast and secure payment gateway and have world-class customer service. Master card debit cards also come with benefits and reward programs that are specific to the type of card they avail from their bank.

3) RuPay debit cards

The National Payments Corporation of India (NPCI) started RuPay as part of India's card scheme with a vision to have a domestic, open and multilateral system of payments. Considering that close to 90 percent of the transactions in India are domestic in nature, RuPay was started to reduce the cost of these transactions that were higher due to the dominance of international card schemes . It is currently accepted mainly within India and at a few locations abroad that RuPay has tie-ups with.

In India, many public, private ,co-operative and regional rural banks issue RuPay cards to its customers. RuPay debit cards are accepted at all ATMs, Point-of-Sale terminals and by most online merchants in the country.

4) Contactless debit cards

These are debit cards which come with built-in radio frequency module that allow you to make payments by simply waving the card over the machine. However, one needs to just hold it close to an RFID reader at the merchant outlet

Parameters	Debit Card	Credit Card
Definition	Deducts money directly from your saving's bank account or your current account.	Allows you to borrow funds to pay for goods and services.
Source of funds	Your savings bank account or current account.	Credit extended to you by your card issuer. It gives you access to money otherwise do not have (like a very short-term loan).
Spending advantage	You can only spend how much you have.	Can spend more than what you have.
Who pays for the purchase	You pay for your purchase.	The credit card company pays the vendor for your purchase. You pay the credit card company.
Bill	There is no bill or statement	You get a bill or statement each month with details of the transactions you have made.

Parameters	Debit Card	Credit Card
Payment	There is no payment that needs to be made since you are using your own money.	A bill needs to be paid each month since it is being borrowed.
Fees and charges	Annual fees and PIN regeneration fees are applicable.	Credit cards have multiple fees applicable. These include joining fees, annual fees, late payment fees, and bounced cheque fees among others.
Interest	There is no interest that is charged.	Interest is charged on the outstanding amount if it hasn't been paid by the due date.
Limit to funds that can be accessed	You can access any amount up to what is currently available in your savings bank or current account.	You can use the card only up to the pre-set credit limit on your card.

Parameters	Debit Card	Credit Card
Rewards	Typically, the rewards you get are minimal	Get to enjoy cash back, air miles, and reward points which can be redeemed.
Lost card liability	Protection from theft or loss of the card is minimal.	Most cards offer 100% lost liability protection. So, you are not liable for any unauthorized transactions made.

Parameters

Debit Card

Credit Card

Rewards

Typically, the rewards you get are minimal

Get to enjoy cash back, air miles, and reward points which can be redeemed.

Lost card liability

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Accumulating balance

- Accumulating balance system allows users to accumulate expenditures over a specific period and make payments in full at the end of the period.
- It is generally used for micro-transactions heavy websites, where numerous products are purchased frequently. The micro-payment system allows users to transfer some money into the online stored value system and use it to pay for digital products.
- The micro payment system is widely used in banks, telecommunications, content providers, internet services providers and search engines.
- The system performs billing, generate invoices, accumulated balances, etc. The system deletes old values and replaces them with current values.
- The system allows users to accumulate debit balance for which they are expected to pay the entire balance at the end of specified period.

*Online stored value payment
systems*

- Stored value payment systems enable consumers to make instant online payments to merchants and other individuals based on value stored in a digital account.
- Online value systems rely on the value stored in a consumer's bank, checking, or credit card account and some of these systems require the use of a digital wallet.
- An account is created where the user deposits the funds which can be used to transfer funds online to merchants or individuals.
- One of the best examples of this system is PayPal.
- It is a peer-to-peer system in which the user's online account is linked with a credit, debit or checking account.

- When a transaction is processed, PayPal automatically debits the user's account and credits the merchant's account, without having to transfer any sensitive customer credit information.
- The PayPal uses email accounts to make and receive payments up to a specified limit.
- It does not involve any sharing of personal credit information among users while conducting online transactions.
- It includes debit cards, gift certificates, prepaid cards, smart cards,.
- It allow user to transfer money from credit card account into an online stored value account.
- It is generally used for low value transactions.

Digital cash

- Digital cash refers to a system in which a person can securely pay for goods or services electronically without necessarily involving a bank to mediate the transaction.
- Digital cash is a system of purchasing cash credits, storing the credits in your computer or digital wallet, and then spending them when making electronic purchases over the internet or in person on a mobile device at the point of sale.
- Digital cash allows individuals to make online transactions using digital currency.
- It is designed to be a convenient and secure alternative to traditional payment methods, such as credit cards or cash.

▪ Digital cash is a form of electronic currency that exists only in cyberspace and has no real physical properties, but offers the ability to use real currency in an electronic format.

▪ Digital cash is also known as e-currency, e-money, electronic-cash, electronic currency, digital money, digital currency, cyber currency. To use digital cash, users must have e-cash software (google pay, paytm etc)

- Digital Cash acts much like real cash, except that it's not on paper.
- Money in your bank account is converted to a digital code.
- With the new monetary landscape that has been built, e-money presents several advantages, including:
 - ❑ The ability to move money quickly, literally at the speed of light.
 - ❑ Better recordkeeping.
 - ❑ Global money transfers.
 - ❑ The ability to move large sums of money without any physical burden.

Digital Wallet

- A digital wallet (or electronic wallet) is a financial transaction application that runs on any connected device.
- Digital wallets allow you to pay when you're shopping using your device so that you don't need to carry your cards around.
- You enter and store your credit card, debit card, or bank account information and can then use your device to pay for purchases.
- Digital wallets are applications designed to take advantage of the abilities of mobile devices to improve access to financial products and services.
- Digital wallets essentially eliminate the need to carry a physical wallet by storing all of a consumer's payment information securely

Advantages

Limits exposure for financial and personal information: Having a digital wallet adds security for your credit cards and identification.

Ends carrying a physical wallet and cards: Possessing forms of payment and ID in your mobile device means you can carry less, avoiding the chance of losing those items.

Can improve financial services access: Availability of digital wallets gives people in underserved areas more options for payment and commerce.

Disadvantages

May not be accepted everywhere: Smaller shops or less-developed areas may not be set up to accept payment via a digital wallet.

May not work if Bluetooth or WiFi aren't available: If an internet setup or electronic point-of-sale network aren't functioning, it may not be possible to pay using a digital wallet.

Vulnerable to identify theft or fraud: If your mobile device is stolen and isn't protected by a password or biometric data, or if your digital wallet is hacked, you could suffer criminal use of the information.

Agile wallet

- It is developed by Cyber-cash.
- It allows the customers to enter credit card and identifying information once, stored on a central server.
- It is a platform to load and manage payment information for billers.
- Information pops up in supported merchants' payment pages, allowing one click payment.
- Agile Wallet means a system operated by or for Cyber-cash that enables consumers to effect, and Internet Merchants to accept, payment transactions.

Smart Cards



A **smart card** is a plastic card that contains a microprocessor and a memory chip or just a memory chip. The microprocessor card has the ability to add, delete and manipulate information on the card. A memory-chip card, such as a phone card, can only add information.

A smart card is a physical plastic card containing an embedded integrated chip acting as a security token. The chip can be an embedded microcontroller or a memory chip. Smart cards with an embedded microcontroller have the distinct ability to store data, carry out on-card functions, like encryption and mutual authentication, and interact with a smart card reader.

The working process of a smart card is comprised of the following steps:

First, the smart card makes contact with the card reader, either directly or indirectly.

The smart card reader receives the information stored on the chip.

This information is sent to the controlling terminal for immediate processing.

The main advantages of smart cards are:

- High levels of security
- Larger memory
- Prevents fraud
- Reliability
- Information Security
- Privacy
- Ease of use
- Reduced cost for operators and users

Electronic Cheques

- An electronic check, or e-check, is a form of payment made via the Internet, designed to perform the same function as a conventional paper check.
- Since the check is in an electronic format, it can be processed in fewer steps.
- An electronic check is a form of payment made via the internet that is designed to perform the same function as a conventional paper check.
- One of the more frequently used versions of the electronic check is the direct deposit system offered by many employers.
- Generally, the costs associated with issuing an electronic check are notably lower than those associated with paper checks.
- An electronic check has more security features than standard paper checks.

E-cheques are cheques that are written and processed electronically. This means that the funds are transferred from the payer's account to the payee's account through an electronic network instead of a physical cheque. These cheques are also known as "digital cheques" or "electronic cheques".

Benefits of Electronic Cheques

- *Faster*: E-cheques are processed faster than traditional paper cheques. This is because there is no need to wait for the cheque to be physically delivered to the payee.
- *More Secure*: E-cheques are more secure than traditional paper cheques because they are processed through an electronic network. This means that there is less chance for them to be lost or stolen.
- *Easier to Track*: E-cheques can be easily tracked through online banking systems. This makes it easy to see where the funds are going and who they are being transferred to.

▪ *Reduces Paper Waste:* E-cheques reduce paper waste because they do not require the use of physical cheque stock. This means that fewer trees need to be chopped down in order to produce paper cheques.

▪ *Saves Time and Money:* E-cheques save time and money because they eliminate the need for manual processing. This means that there is less chance for human error and that the funds will be transferred more quickly.

How does e-check payment processing work?

E-check payment processing works by electronically transferring funds from a payer's bank account to a payee's bank account. The process is initiated by the payer entering their bank account information, which is then verified by the payee's bank and the funds are transferred securely. The entire process is completed without the need for physical checks or cash transactions.

*Secure Electronic Transaction (SET)
protocol*

- SET stands for Secure Electronic Transaction.
- **Secure Electronic Transaction** or SET is a system that ensures the security and integrity of electronic transactions done using credit cards in a scenario.
- SET is not some system that enables payment but it is a security protocol applied to those payments.
- It uses different encryption and hashing techniques to secure payments over the internet done through credit cards.
- The SET protocol was supported in development by major organizations like Visa, Master card, and Microsoft which provided its Secure Transaction Technology (STT), and Netscape which provided the technology of Secure Socket Layer (SSL).

- SET protocol restricts the revealing of credit card details to merchants thus keeping hackers and thieves at bay.
- The SET protocol includes Certification Authorities for making use of standard Digital Certificates.
- **Participants in SET:** In the general scenario of online transactions, SET includes similar participants:
 - **Cardholder** – customer
 - **Issuer** – customer financial institution
 - **Merchant**
 - **Acquirer** – Merchant financial
 - **Certificate authority** – Authority that follows certain standards and issues certificates (like X.509V3) to all other participants.

SET functionalities:

□ Provide Authentication

Merchant Authentication – To prevent theft, SET allows customers to check previous relationships between merchants and financial institutions. Standard X.509V3 certificates are used for this verification.

Customer / Cardholder Authentication – SET checks if the use of a credit card is done by an authorized user or not using X.509V3 certificates.

□ Provide Message Confidentiality:

Confidentiality refers to preventing unintended people from reading the message being transferred. SET implements confidentiality by using encryption techniques. Traditionally DES is used for encryption purposes.

❑ **Provide Message Integrity:** SET doesn't allow message modification with the help of signatures. Messages are protected against unauthorized modification using RSA digital signatures with SHA-1 and some using HMAC with SHA-1,

❑ **Dual Signature:** The dual signature is a concept introduced with SET, which aims at connecting two information pieces meant for two different receivers :

Order Information (OI) for merchant
Payment Information (PI) for bank

Thank You

UNIT 4
E-BUSINESS
MARKETING
TECHNOLOGIES

- E-Commerce and marketing B to B and B to C marketing and branding strategies
- Web transaction logs
- Cookies
- Shopping cart database
- DBMS
- SQL
- Data mining
- CRM (customer relationship Management) system
- Permission marketing, Affiliate marketing
- Viral marketing

- E-commerce marketing is the process of driving sales by guiding online shoppers towards e-commerce website and carrying them to purchase the services or products online.
- It raises awareness in customers about an online store's brand and product offerings.
- The e-commerce marketing applies traditional marketing principles to a multi-channel, data-driven environment.
- Today, every company develops their web site with the main objective of selling their products and services online, besides it takes a successful limitless and highly competitive market space of the internet and web.
- Hence, the marketing concepts and product branding is very critical for e-commerce.

E commerce marketing techniques

□ *Content marketing*

- Content marketing is a strategic marketing approach focused on creating and distributing valuable, relevant, and consistent content to attract and retain a clearly defined audience — and, ultimately, to drive profitable customer action.
- Instead of pitching products or services, content marketing provides relevant and useful content to your prospects and customers to help them solve issues in their work (B2B content) or personal lives (B2C content).
- Content marketing is a marketing technique that involves the creation and sharing of digital assets (media and publishing content) in order to acquire customers.

- This information can be presented in a variety of formats, including news, video, white papers, e-books, infographics, case studies, articles, blogs entries, contests, diagrams, how-to-guides, question and answer articles, photos, free offers, games, quizzes, reviews, slide shows, etc.
- This technique creates and distributes relevant and valuable content to attract, acquire and engage the target audience with the objective of driving profitable customer action.
- It is an ongoing process that delivers consistent and valuable information to buyers.
- Content marketing is being used by some of the greatest marketing organizations in the world, including P&G, Dabur, Microsoft, CISCO Systems and John Deere.

□ *Social media*

- Social media marketing (also known as digital marketing and e-marketing) is the use of social media—the platforms on which users build social networks and share information—to build a company's brand, increase sales, and drive website traffic.
- With over 80% of consumers reporting that social media—especially influencer content—significantly impacts buying decisions, marketers across industries are driving the evolution of social media marketing (SMM) from a stand-alone tool to a multipronged source of marketing intelligence on an increasingly important—and growing—audience.

- Social media marketing uses social media and social networks—like Facebook, X platform (formerly Twitter), and Instagram—to market products and services, engage with existing customers, and reach new ones.
- The power of social media marketing comes from the unparalleled capacity of social media in three core marketing areas: connection, interaction, and customer data.
- Social media marketing has transformed the way businesses are able to influence consumer behavior—from promoting content that drives engagement to extracting personal data that makes messaging resonate with users.
- Because social media today is so ubiquitous, marketing techniques using these platforms are extremely important for businesses.
- Social media marketing is often more cost-effective with great exposure, though it requires ongoing maintenance and might have unintended negative feedback consequences.

□ *Advantages of SSM*

- Better Customer Satisfaction
- Brand Awareness Is Improved
- Gain Better Market Insights
- It's Very Cost-Effective
- Inbound Traffic Is Boosted

□ *Disadvantages of SSM*

- Time-Consuming Process
- Competitor Exposure
- Qualified Staff Are Needed
- Brand Name Is Vulnerable
- Slow Return On Income Results

□ *Email marketing*

▪ *Ecommerce email marketing is an effective marketing strategy that uses email to promote products of an online store to existing or potential customers.*

▪ Emails are one of the most popular means of digital communication, and that's the main reason why using them for marketing activities can be extremely effective.

▪ They help blow up user engagement, build customer loyalty, share useful information, announce the hottest deals, and boost sales.

□ *Mobile marketing*

- Mobile marketing is any advertising activity that promotes products and services via mobile devices, such as tablets and smart phones.
- It makes use of features of modern mobile technology, including location services, to tailor marketing campaigns based on an individual's location.
- Mobile marketing is a way in which technology can be used to create personalized promotion of goods or services to a user who is constantly connected to a network.

How Mobile Marketing Works

- Mobile marketing may include promotions sent through SMS text messaging, MMS multimedia messaging, through downloaded apps using push notifications, through in-app or in-game marketing, through mobile websites, or by using a mobile device to scan QR codes.

□ ***Advantages***

- Direct Marketing to the People
- Tracking Customer Response
- Reach the Global Audience Easily
- Increase engagement of the Business with Customers
- Build Relationships with Customers
- Put Your Business Ahead of Your Competitor
- Micro Blogging Benefits
- Instant Result
- Mobile Marketing is Very Cost Effective
- Instant Money Transaction
- More Viral Potential
- Location and Personalization
- Easy Access
- Create Additional Promotional Streams
- Advertise Your Business Using Mobile Phone Marketing

□ *Disadvantages*

- Ignored by Viewers
- Small Screen Size Problem
- Privacy Issues with Mobile Marketing
- Little Room for Errors Upfront
- Potential for Bad User Experiences
- Possible Navigation Issues
- Mobile landing page optimization Issue
- Ad Blocking Control
- Mobile Marketing Dependent on Technology
- Lack of Professionals
- User Cost

□ *Online catalog*

- An online catalog is a list of items or services available to the customers presented over the internet.
- Online catalogs simplify the purchasing process.
- It is believed that online catalogs were first developed in 1975 at the Ohio State University, USA.
- Online catalogs are also referred to as B2B e-commerce catalogs or digital catalog. B2B suppliers often have searchable databases of their goods and new features that significantly improve their browsing experience and buying on the platform.
- These catalogs can be e-designs of magazines, newspapers, brochures, flyers, books, etc.
- There is no limit to what can be included in an online catalog—jewelry, clothing, electronics, or even food items.

□ *Advantages*

- Buyers could easily check out the specifications, prices, and features of the product before making the purchase decision
- Companies have got the option to target particular types of customers
- Much a safe option for the security of the funds; here customers would pay you in advance and you don't have to worry about your stuck investment
- It allows companies to target their customers on their doorsteps and you don't have to wait for them
- ROI is higher in the catalog market approach; studies have shown that; it converts roundabout 8 of every 10 buyers
- High cost-efficient approach; if a company doesn't have its catalogue, it can add the products of other companies
- Customers accept the catalogue as a trusted and valid source of information

□ *Disadvantages*

- It is not a suitable approach for such customers that want the brick-and-mortar store experience before the shopping
- In order to make catalogue marketing work, it requires an excellent copywriting skill
- Doesn't work in the highly competitive market, because a bad presentation could damage your reputation
- Winning the trust and confidence of customers, takes time

Web transaction logs

- The transaction log is an integral part of SQL Server.
- Every database has a transaction log that is stored within the log file that is separate from the data file.
- A transaction log basically records all database modifications.
- When a user issues an INSERT, for example, it is logged in the transaction log.
- This enables the database to roll back or restore the transaction if a failure were to occur and prevents data corruption.

- The term transaction refers to a collection of operations that form a single logical unit of work.
- For instance, transfer of money from one account to another is a transaction consisting of two updates, one to each account.

- For example: if a bank has to transfer 1,000 dollars from account A to account B, then the following steps are required before the transfer is successful.
 - ✓ Reduce the balance of account A by the amount of 1,000.
 - ✓ Increase the balance of account B by the amount of 1,000.

- In e-commerce, a web transaction can be defined as a sequence of activities performed by a user to achieve a specific goal related to a step of business transaction, through a web-based application.

- A primary source of consumer information on the web is the transaction log maintained by all the web-servers.
- A web transaction log possesses the following characteristics:
 - ✓ It records user activity at a website.
 - ✓ It is built into web server software.
 - ✓ It provides much marketing data, especially combined with registration forms.

Cookies

- Everyone has seen the website banners that ask you if you'll allow cookies on your browser or not.
- But what exactly does this mean and what are these cookies?
- A necessary part of browsing the web, cookies help web developers give you a more personal and convenient website visit.
- In short, cookies let websites remember you, your logins, shopping carts and more.
- But they can also be a treasure trove of private info and a serious vulnerability to your privacy.

- **Cookies** (often known as internet cookies) are text files with small pieces of data like a username and password, that are used to identify your computer as you use a network.
- Specific cookies are used to identify specific users and improve their web browsing experience.
- Data stored in a cookie is created by the server upon your connection.
- This data is labeled with an ID unique to you and your computer. When the cookie is exchanged between your computer and the network server, the server reads the ID and knows what information to specifically serve you.

Uses of cookies

To be more concise, cookies are intended to be used for:

- **Session management:** For example, cookies let websites recognize users and recall their individual login information and preferences, such as sports news versus politics.

- **Personalization:** Customized advertising is the main way cookies are used to personalize your sessions. You may view certain items or parts of a site, and cookies use this data to help build targeted ads that you might enjoy. They're also used for language preferences as well.

- **Tracking:** Shopping sites use cookies to track items users previously viewed, allowing the sites to suggest other goods they might like and keep items in shopping carts while they continue shopping on another part of the website. They will also track and monitor performance analytics, like how many times you visited a page or how much time you spent on a page.

□ *Advantages*

1. User Friendly

Cookies are extremely user friendly. The client can choose what they need to do with cookies. All the browsers come with settings to clear history including the cookies. Manually users could find the cookies text files stored in the hard drive. Users can choose to edit and delete them.

2. Availability

Cookies can also set to be made available for a longer period of time. Once the cookies are stored on the user's hard drive, it will be available as long as the user deletes them manually. Even if the server fails, information can be retrieved from the cookies.

3. Convenience

Besides websites, cookies can also remember information related to forms. So each time the user visits the site, the address form will be filled automatically. However, cookies will not remember confidential information such as credit card info.

4. Marketing

Most companies, especially, e-commerce sites tends to use cookies to target products to their customers. Information such as search term, keywords and geographical locations are gathered for their marketing campaign. Even social networking sites like Facebook use cookies to show relevant ads.

5. Configurations

Cookies can also be configured as per the requirement. For an example, it can be made to expire once the user closes the browser tab or set to exist only for a specific period of time.

6. Server Requirement

All the data related to cookies are stored on the hard drive without the use of server resources. No extra load or weight is added to the server. Therefore, less burden is placed on them which makes cookies easier to implement.

□ *Disadvantages*

1. Browser Impacts

Cookies are not restricted based on internet usage. Whenever a user surfs the web, more and more cookies will be accumulated. Unless the user deletes them, these cookies will be a part of the hard drive space. This eventually slows down or lags the browser.

2. Security Risks

Since cookies are stored in the hard drive as text files, it poses some serious security risks. Any intruder can easily open these files and view the information. And also, not all the sites that collect information from cookies are legitimate. Some of them can be malicious that uses cookies for the purpose of hacking.

3. Size Limitations

Size limitations also exist on cookies. They cannot store large amount of information. Most cookies are able to store information only up to 4kb. Browsers too pose restrictions when it comes to number of cookies. Except internet explorer, all other browsers only allow up to 20 cookies for a single website.

4. Privacy Concerns

Apart from security, privacy is another concern for users in cookies. Whenever the user browses the internet, the cookie enabled sites will be recording all the online activities. Most users are unaware that such information are stored on their hard drive. As a result, this information can be accessed by any third parties including government agencies and businesses.

5. Manual Disabling

Browsers also comes with the option to disable cookies. Users who are highly security conscious could simply disable them. Even some browsers disable cookies automatically if the security level is set to high. Therefore, web applications will not work without cookies.

Shopping cart database

- An e-commerce shopping cart serves as a virtual cart that allows customers to add and hold items until they complete the purchase.
- It accepts payments of customers and organizes and distributes all order information to the merchant, customer, and other relevant parties.
- This process requires a database to store and retrieve the relevant data while supporting the functionality of the shopping cart.
- A shopping cart database will contain all the critical information about products, orders, and customers and allow users to perform real-time changes reflected in their shopping sessions.

DBMS

- A database management system (or DBMS) is essentially nothing more than a computerized data-keeping system.
- Users of the system are given facilities to perform several kinds of operations on such a system for either manipulation of the data in the database or the management of the database structure itself.
- Database Management Systems (DBMSs) are categorized according to their data structures or types.

▪ A database management system (DBMS) is system software for creating and managing databases. A DBMS makes it possible for end users to create, protect, read, update and delete data in a database. The most prevalent type of data management platform, the DBMS essentially serves as an interface between databases and users or application programs, ensuring that data is consistently organized and remains easily accessible.

- A database management system functions through the use of system commands, first receiving instructions from a database administrator in DBMS, then instructing the system accordingly, either to retrieve data, modify data, or load existing data from the system.
- Popular DBMS examples include cloud-based database management systems, in-memory database management systems (IMDBMS), columnar database management systems (CDBMS), and NoSQL in DBMS.

□ Difference Between Data and Information in DBMS

Data is raw, unprocessed, unorganized facts that are seemingly random and do not yet carry any significance or meaning. Information refers to data that has been organized, interpreted, and contextualized by a human or machine so that it possess relevance and purpose.

Information is filtered data that has been made systematic and useful, and is considered to be more reliable and valuable to researchers as proper analysis and refinement has been conducted. A DBMS is concerned with the manipulation of data in a database.

□ Features of DBMS

Data Definition Language (DDL): DBMS provides DDL, which is a language used to define the database schema, such as tables, indexes, and views. It allows users to create, modify, and delete database objects.

Data Manipulation Language (DML): DBMS provides DML, which is a language used to manipulate data within the database. It allows users to insert, update, delete, and retrieve data from the database.

Data Integrity: DBMS ensures data integrity by enforcing constraints, such as primary keys, foreign keys, and unique keys. It prevents duplicate records and ensures that data is accurate and consistent.

Data Security: DBMS provides data security features such as access control, authentication, and authorization. It ensures that only authorized users can access and modify data.

Backup and Recovery: DBMS provides backup and recovery mechanisms to protect against data loss due to system failures, natural disasters, or other unforeseen events.

Transaction Management: DBMS provides transaction management to ensure that all database operations are performed in a consistent and reliable manner. It ensures that the database remains in a consistent state, even in case of system failures or interruptions.

Concurrency Control: DBMS provides concurrency control to allow multiple users to access and modify data simultaneously without interfering with each other's work. It ensures that data remains consistent even when multiple users are modifying it concurrently.

Query Optimization: DBMS provides query optimization, which is the process of choosing the most efficient query execution plan to retrieve data from the database. It ensures that queries are executed in the most efficient manner possible, reducing system overhead and improving performance.

Scalability: DBMS provides scalability to accommodate increasing amounts of data and users. It allows users to add more resources such as storage and processing power as needed to handle larger amounts of data and users.

□ Advantages of DBMS:

Improved Data Sharing: DBMS enables data sharing among multiple users and applications. Multiple users can access the same data simultaneously, without interfering with each other's work. This improves collaboration and productivity, as well as reduces the risk of data duplication.

Data Integration: DBMS allows the integration of data from multiple sources. This means that data can be collected from various systems and combined into a single database, which makes it easier to access and analyze.

Data Security: DBMS provides various security features such as access control, authentication, and encryption to safeguard data from unauthorized access and prevent data loss or corruption.

Data Consistency: DBMS enforces consistency in data by ensuring that data is accurate, complete, and up-to-date. This helps to avoid data inconsistencies and errors that can result in significant consequences for an organization.

Data Integrity: DBMS ensures that data is stored and retrieved without any loss or corruption. It provides mechanisms such as transaction management and recovery, which guarantees data integrity even in case of system failures.

❑ Disadvantages of DBMS:

High Cost: Implementing a DBMS can be expensive due to the cost of licensing, hardware, and maintenance. This cost can be particularly significant for smaller organizations.

Complexity: DBMS is a complex software that requires a significant amount of technical expertise to install, configure, and maintain. This complexity can lead to increased maintenance costs and technical difficulties.

System Overhead: DBMS requires system resources such as memory, CPU, and disk space, which can lead to system overhead and reduced system performance.

Data Dependency: DBMS stores data in a particular format, which can create data dependency issues. If the format changes, it can affect the application that uses the data, leading to additional maintenance and development costs.

Single Point of Failure: DBMS represents a single point of failure for an organization's data. If the DBMS fails, it can lead to significant data loss and downtime, which can have a severe impact on the business.

SQL

- SQL stands for “Structured Query Language”.
- It is a special purpose language used to define, access, and manipulate data in RDBMS.
- It is the way you interact with the database management system.

SQL follows the following rules:

- ✓ Structure query language is not case sensitive. Generally, keywords of SQL are written in uppercase.
- ✓ Statements of SQL are dependent on text lines. We can use a single SQL statement on one or multiple text line.
- ✓ Using the SQL statements, you can perform most of the actions in a database.

SQL process:

- When an SQL command is executing for any RDBMS, then the system figure out the best way to carry out the request and the SQL engine determines that how to interpret the task.
- In the process, various components are included. These components can be optimization Engine, Query engine, Query dispatcher, classic, etc.
- All the non-SQL queries are handled by the classic query engine, but SQL query engine won't handle logical files.

Advantages of SQL :

SQL has many advantages which makes it popular and highly demanded. It is a reliable and efficient language used for communicating with the database. Some advantages of SQL are as follows:

Faster Query Processing

Large amount of data is retrieved quickly and efficiently. Operations like Insertion, deletion, manipulation of data is also done in almost no time.

No Coding Skills –

For data retrieval, large number of lines of code is not required. All basic keywords such as SELECT, INSERT INTO, UPDATE, etc are used and also the syntactical rules are not complex in SQL, which makes it a user-friendly language.

Standardized Language –

Due to documentation and long establishment over years, it provides a uniform platform worldwide to all its users.

Portable –

It can be used in programs in PCs, server, laptops independent of any platform (Operating System, etc). Also, it can be embedded with other applications as per need/requirement/use.

Interactive

Easy to learn and understand, answers to complex queries can be received in seconds.

Language

–

Scalability: SQL databases can handle large volumes of data and can be scaled up or down as per the requirements of the application.

Security: SQL databases have built-in security features that help protect data from unauthorized access, such as user authentication, encryption, and access control.

Data Integrity: SQL databases enforce data integrity by enforcing constraints such as unique keys, primary keys, and foreign keys, which help prevent data duplication and maintain data accuracy.

Backup and Recovery: SQL databases have built-in backup and recovery tools that help recover data in case of system failures, crashes, or other disasters.

Data Consistency: SQL databases ensure consistency of data across multiple tables through the use of transactions, which ensure that changes made to one table are reflected in all related tables.

Disadvantages of SQL :
Although SQL has many advantages, still there are a few disadvantages.

Various Disadvantages of SQL are as follows:

Complex Interface
SQL has a difficult interface that makes few users uncomfortable while dealing with the database.

Cost
Some versions are costly and hence, programmers cannot access it.

Partial Control
Due to hidden business rules, complete control is not given to the database.

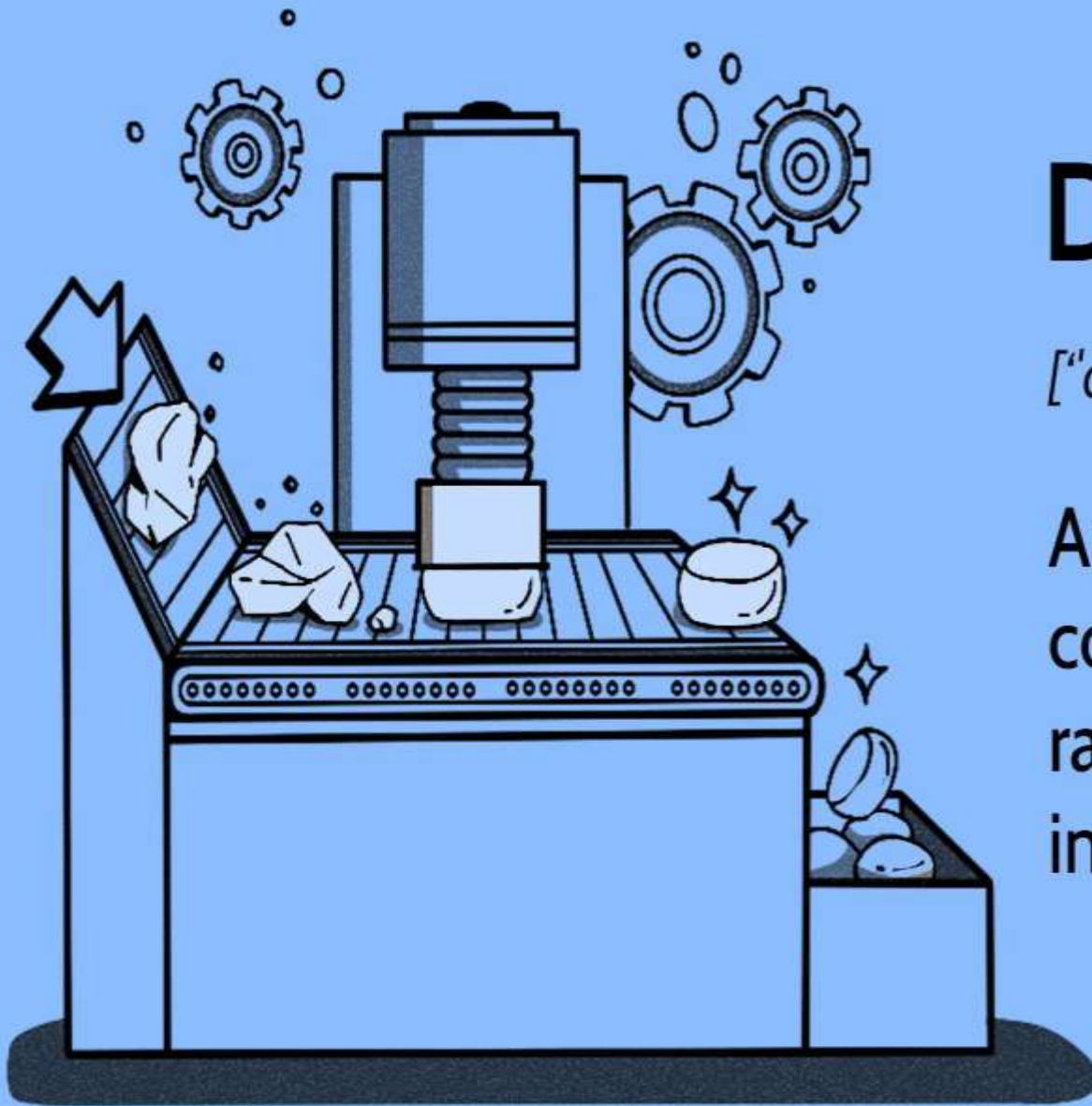
Limited Flexibility
SQL databases are less flexible than NoSQL databases when it comes to handling unstructured or semi-structured data, as they require data to be structured into tables and columns.

Lack of Real-Time Analytics: SQL databases are designed for batch processing and do not support real-time analytics, which can be a disadvantage for applications that require real-time data processing.

Limited Query Performance: SQL databases may have limited query performance when dealing with large datasets, as queries may take longer to process than in-memory databases.

Complexity: SQL databases can be complex to set up and manage, requiring skilled database administrators to ensure optimal performance and maintain data integrity.

Data mining



Data Mining

[ˈdā-tə ˈmī-niŋ]

A process used by companies to turn raw data into useful information.

- Data mining is the process of searching and analyzing a large batch of raw data in order to identify patterns and extract useful information.
- Companies use data mining software to learn more about their customers.
- It can help them to develop more effective marketing strategies, increase sales, and decrease costs.
- Data mining relies on effective data collection, warehousing, and computer processing.

How Data Mining Works

Data mining involves exploring and analyzing large blocks of information to glean meaningful patterns and trends. It is used in credit risk management, fraud detection, and spam filtering. It also is a market research tool that helps reveal the sentiment or opinions of a given group of people. The data mining process breaks down into four steps:

1. Data is collected and loaded into data warehouses on-site or on a cloud service.
2. Business analysts, management teams, and information technology professionals access the data and determine how they want to organize it.
3. Custom application software sorts and organizes the data.
4. The end user presents the data in an easy-to-share format, such as a graph or table.

The Data Mining Process

To be most effective, data analysts generally follow a certain flow of tasks along the data mining process. Without this structure, an analyst may encounter an issue in the middle of their analysis that could have easily been prevented had they prepared for it earlier. The data mining process is usually broken into the following steps.

Step 1: Understand the Business

Step 2: Understand the Data

Step 3: Prepare the Data

Step 4: Build the Model

Step 5: Evaluate the Results

Step 6: Implement Change and Monitor

Step 1: Understand the Business

Before any data is touched, extracted, cleaned, or analyzed, it is important to understand the underlying entity and the project at hand. What are the goals the company is trying to achieve by mining data? What is their current business situation? What are the findings of a SWOT analysis? Before looking at any data, the mining process starts by understanding what will define success at the end of the process.

Step 2: Understand the Data

Once the business problem has been clearly defined, it's time to start thinking about data. This includes what sources are available, how they will be secured and stored, how the information will be gathered, and what the final outcome or analysis may look like. This step also includes determining the limits of the data, storage, security, and collection and assesses how these constraints will affect the data mining process.

Step 3: Prepare the Data

Data is gathered, uploaded, extracted, or calculated. It is then cleaned, standardized, scrubbed for outliers, assessed for mistakes, and checked for reasonableness. During this stage of data mining, the data may also be checked for size as an oversized collection of information may unnecessarily slow computations and analysis.

Step 4: Build the Model

With our clean data set in hand, it's time to crunch the numbers. Data scientists use the types of data mining above to search for relationships, trends, associations, or sequential patterns. The data may also be fed into predictive models to assess how previous bits of information may translate into future outcomes.

Step 5: Evaluate the Results

The data-centered aspect of data mining concludes by assessing the findings of the data model or models. The outcomes from the analysis may be aggregated, interpreted, and presented to decision-makers that have largely been excluded from the data mining process to this point. In this step, organizations can choose to make decisions based on the findings.

Step 6: Implement Change and Monitor

The data mining process concludes with management taking steps in response to the findings of the analysis. The company may decide the information was not strong enough or the findings were not relevant, or the company may strategically pivot based on findings. In either case, management reviews the ultimate impacts of the business and recreates future data mining loops by identifying new business problems or opportunities.

Applications of Data Mining

□Sales

Data mining encourages smarter, more efficient use of capital to drive revenue growth. Consider the point-of-sale register at your favorite local coffee shop. For every sale, that coffeehouse collects the time a purchase was made and what products were sold. Using this information, the shop can strategically craft its product line.

□Marketing

Once the coffeehouse above knows its ideal line-up, it's time to implement the changes. However, to make its marketing efforts more effective, the store can use data mining to understand where its clients see ads, what demographics to target, where to place digital ads, and what marketing strategies most resonate with customers. This includes aligning marketing__campaigns, promotional offers, cross-sell offers, and programs to the findings of data mining.

□ Manufacturing

For companies that produce their own goods, data mining plays an integral part in analyzing how much each raw material costs, what materials are being used most efficiently, how time is spent along the manufacturing process, and what bottlenecks negatively impact the process. Data mining helps ensure the flow of goods is uninterrupted.

□ Fraud Detection

The heart of data mining is finding patterns, trends, and correlations that link data points together. Therefore, a company can use data mining to identify outliers or correlations that should not exist. For example, a company may analyze its cash flow and find a reoccurring transaction to an unknown account. If this is unexpected, the company may wish to investigate whether funds are being mismanaged.

□ Human Resources

Human resources departments often have a wide range of data available for processing including data on retention, promotions, salary ranges, company benefits, use of those benefits, and employee satisfaction surveys. Data mining can correlate this data to get a better understanding of why employees leave and what entices new hires.

□ Customer Service

Customer satisfaction may be caused (or destroyed) for a variety of reasons. Imagine a company that ships goods. A customer may be dissatisfied with shipping times, shipping quality, or communications. The same customer may be frustrated with long telephone wait times or slow e-mail responses. Data mining gathers operational information about customer interactions and summarizes the findings to pinpoint weak points and highlight what the company is doing right.

**CRM (customer
relationship Management)
system**

▪ Customer relationship management is about defining the guidelines, principles, and practices your organization follows to guide interactions with customers. Ideally, your company achieves outcomes that improve your customer service relationships, boosting customer retention efforts, and driving business growth.

▪ **There are many benefits to using CRM software to manage your customer relationships, including:**

- ✓ Aggregating essential customer info
- ✓ Tracking customer interactions
- ✓ Keep up with sales performance goals
- ✓ Making customer info available throughout an organization

Types of CRM

Today, many comprehensive CRM platforms integrate all parts of the customer relationship the business may have. However, some CRMs are still designed to target a specific aspect of it:

Sales CRM: to drive sales and increase the pipeline of new customers and prospects. Emphasis is placed on the sales cycle from tracking leads to closing deals.

Marketing CRM: to build, automate, and track marketing campaigns (especially online or via email), including identifying targeted customer segments. These CRMs provide real-time statistics and can use A/B testing to optimize strategies.

Service CRM: integrated dedicated customer service support with sales and marketing. Often features multiple contact points including responsive online chat, mobile, email, and social media.

Collaborative CRM: encourages the sharing of customer data across business segments and among teams to improve efficiency and communication and work seamlessly together.

Small Business CRM: optimized for smaller businesses with fewer customers to give those customers the best possible experience. These systems are often much simpler, intuitive, and less expensive to implement than enterprise CRM.

Permission marketing, Affiliate marketing

- Permission marketing refers to a form of advertising where the intended audience is given the choice of opting in to receive promotional messages. The concept of permission marketing has been popularized by Seth Godin, an entrepreneur and author. Common forms of permission marketing include opting into receiving updates as part of an email list.
- The audience who wishes to receive marketing and promotional emails signs up in advance with businesses through their online platforms.
- It is the practice of requesting consent from customers before sending them promotional materials or advertisements about products and services.
- Proven to be successful in driving consumer engagement and brand loyalty, permission marketing is an excellent way for businesses to connect with their customers and build lasting relationships.

Types of Permission Marketing

Permission marketing is of two main types, such as Implied permission marketing, and Express permission marketing.

1. Implied permission marketing

In implied permission marketing, the business has relationships with the customers to whom they send the email marketing messages. The customers can be someone who has recently bought something from the company or somebody who has recently visited the web platform of the business.

2. Express permission marketing

In express permission marketing, the customers who are willing to receive the promotional email of the company provide their email addresses to the company. This marketing method refers to the relationship that a business creates with a new customer. For example, a customer signs up for your monthly newsletter.



Affiliate Marketing

[ə-'fi-lē-,āt 'mär-kə-tiŋ]

An advertising model in which a company compensates third-party partners for promoting products and services and generating business.

- Affiliate marketing is a great way to generate some additional income. You can become an affiliate marketer and recommend other brands, or you can start an affiliate program to start promoting your own existing brand.
- Affiliate marketing is a process where publishers earn a commission by using an affiliate link to promote a product or service made by another retailer or advertiser.
- The affiliate partner is rewarded a payout for providing a specific result to the retailer or advertiser.
- Typically, the result is a sale.

How affiliate marketing works

Affiliate programs work by allowing individuals (affiliates) to promote and sell products or services of a company in exchange for a commission on each sale. The affiliate earns a commission each time someone makes a purchase through the unique affiliate link associated with their recommendation.

Here's how it works at a high level:

- ✓ An affiliate shows an ad or a link for Store Z on their website, blog, or social network.
- ✓ A customer clicks the unique affiliate link.
- ✓ The customer makes a purchase in Store Z.
- ✓ The affiliate network records the transaction.
- ✓ The purchase is confirmed by Store Z.
- ✓ The affiliate gets paid a monetary commission.

Advantages of Affiliate Marketing

- Low-Cost Business
- No Special Expertise
- Limited Investment
- Additional Source of Income
- Flexibility & Convenience
- Not Focused on Customer Service
- Passive Income
- Sky's the Limit
- Sole Proprietorship
- Flexible Timing
- Performance-Based Salary

Disadvantages of Affiliate Marketing

- Uncontrolled Competition
- No Customer Base
- Unguaranteed Income
- Freelancing Unsuitable for Everyone
- Quantity Approach

Viral marketing

▪Viral marketing seeks to spread information about a product or service from person to person by word of mouth or sharing via the Internet or email.

▪The goal of viral marketing is to inspire individuals to share a marketing message with friends, family, and other individuals to create exponential growth in the number of its recipients.

Advantages of Viral Marketing

Low cost: what characterizes viral campaigns is that the users do a significant part of the work for the brand, which drastically cuts down the costs of distribution. It is unnecessary to buy advertising or media space.

Its potential to reach a lot of users: a viral video on the Internet has the ability to reach a huge international audience without the brand behind it having to invest a lot of money or make an extra effort. Due to this, a small company or even a private individual can go viral.

It is not invasive: in viral marketing, the social media user is the one making the decision to participate and share the content, so it lessens the possibility of the brand coming across as invasive or annoying. Because of this, the perception of the brand and the interaction are significantly better, compared to more typical forms of advertising.

It helps build up your brand: if you really hit the bulls eye in terms of creativity, you can make content so incredible that users share it and develop a personal connection with your brand. This is without a doubt an extremely powerful tool when it comes to branding and awareness.

Disadvantages of Viral Marketing

Issue of Spam

Viral marketing uses means such as e-mails and commenting on blogs and forums. When viral marketing is done on a large scale. It becomes annoying for the email receiver to receive a large number of emails in their inbox, and they are filtered as spam messages.

Restricts to Spreading of Message

Viral marketing talks about only spreading the message to potential consumers through online means but spreading the message does not benefit the firm. Sales occurred at the end for the firm to benefit, but the amount of sales made apart from promotions is questionable under viral marketing.

Viral Marketing is Unquantifiable

Results directly attributable to viral marketing are unquantifiable as companies use other marketing techniques, and the purchase motivation of the consumer depends on the black consumer box, not based on viral marketing.

Competition Prone

In the viral marketing strategy, association with unknown groups and individuals could generate scope for the promotion to be subject to competitor viewing. The strength of marketing depends on the transmission of enthusiasm among people about the benefits of the product being sold. A competitor within the generated link could dampen the desired strain.



thank you

UNIT 5

CYBER LAWS

- Legal Aspects of E-Business
- Internet frauds - Cyber Laws
- IT Act 2000 salient features.

Legal Aspects of E-Business



- One of the significant legal challenges that e-commerce businesses face is privacy and data protection.
- E-commerce websites collect sensitive customer information, such as their names, addresses, contact details, and payment information.
- This data is often stored in databases susceptible to hacking or cyber-attacks.
- As such, companies must comply with data protection laws to avoid any legal consequences.
- Consumer protection is another significant legal issue for e-commerce businesses.
- Online transactions are inherently risky since the customer needs help physically verifying the product's authenticity or quality.
- As such, e-commerce businesses should provide product information, including the product's features, pricing, and availability, to ensure the customer is thoroughly knowledgeable of the product's specifications.

▪ Copyright

- Copyright refers to the legal right of the owner of intellectual property.
- In simpler terms, copyright is the right to copy.
- This means that the original creators of products and anyone they give authorization to are the only ones with the exclusive right to reproduce the work.
- Copyright law gives creators of original material the exclusive right to further use and duplicate that material for a given amount of time.
- Once a copyright expires, the copyrighted item becomes public domain.

■ *How Copyrighting Works*

- When someone creates a product that is viewed as original and that required significant mental activity to create, this product becomes an intellectual property that must be protected from unauthorized duplication.
- Examples of unique creations include:
 - Novels
 - Art
 - Poetry
 - Musical lyrics and compositions
 - Computer software
 - Graphic designs,
 - Film
 - Original architectural designs
 - Website content

- Copyright law protects creators of original material from unauthorized duplication or use.
- For an original work to be protected by copyright laws, it has to be in tangible form.
- In the U.S., the work of creators usually is protected by copyright laws until 70 years after their death.
- Other forms of protection for property that cannot be copyrighted include trademarks and patents.

▪ Cyber Law

- Cyber Law also called IT Law is the law regarding Information-technology including computers and the internet.
- It is related to legal informatics and supervises the digital circulation of information, software, information security, and e-commerce.
- IT law does not consist of a separate area of law rather it encloses aspects of contract, intellectual property, privacy, and data protection laws.
- Intellectual property is a key element of IT law.
- **Importance of Cyber Law:**
- It covers all transactions over the internet.
- It keeps eye on all activities over the internet.
- It touches every action and every reaction in cyberspace.

▪ Advantages of Cyber Law:

- Organizations are now able to carry out e-commerce using the legal infrastructure provided by the Act.
- Digital signatures have been given legal validity and sanction in the Act.
- It has opened the doors for the entry of corporate companies for issuing Digital Signatures Certificates in the business of being Certifying Authorities.
- It allows Government to issue notifications on the web thus heralding e-governance.

- It gives authority to the companies or organizations to file any form, application, or any other document with any office, authority, body, or agency owned or controlled by the suitable Government in e-form using such e-form as may be prescribed by the suitable Government.

- The IT Act also addresses the important issues of security, which are so critical to the success of electronic transactions.

- Cyber Law provides both hardware and software security.

▪ Area of Cyber Law:

Cyber laws contain different types of purposes.

Some laws create rules for how individuals and companies may use computers and the internet while some laws protect people from becoming the victims of crime through unscrupulous activities on the internet. The major areas of cyber law include:

Fraud

Copyright

Defamation

Harassment and Stalking

Freedom of Speech

Trade Secrets

Contracts and Employment Law

Fraud:

Consumers depend on cyber laws to protect them from online fraud. Laws are made to prevent identity theft, credit card theft, and other financial crimes that happen online. A person who commits identity theft may face confederate or state criminal charges. They might also encounter a civil action brought by a victim. Cyber lawyers work to both defend and prosecute against allegations of fraud using the internet.

Copyright:

The internet has made copyright violations easier. In the early days of online communication, copyright violations were too easy. Both companies and individuals need lawyers to bring an action to impose copyright protections. Copyright violation is an area of cyber law that protects the rights of individuals and companies to profit from their creative works.

Defamation:

Several personnel uses the internet to speak their mind. When people use the internet to say things that are not true, it can cross the line into defamation. Defamation laws are civil laws that save individuals from fake public statements that can harm a business or someone's reputation. When people use the internet to make statements that violate civil laws, that is called Defamation law.

Harassment

and

Stalking:

Sometimes online statements can violate criminal laws that forbid harassment and stalking. When a person makes threatening statements again and again about someone else online, there is a violation of both civil and criminal laws. Cyber lawyers both prosecute and defend people when stalking occurs using the internet and other forms of electronic communication.

Freedom of Speech:

Freedom of speech is an important area of cyber law. Even though cyber laws forbid certain behaviors online, freedom of speech laws also allows people to speak their minds. Cyber lawyers must advise their clients on the limits of free speech including laws that prohibit obscenity. Cyber lawyers may also defend their clients when there is a debate about whether their actions consist of permissible free speech.

Trade Secrets:

Companies doing business online often depend on cyber laws to protect their trade secrets. For example, Google and other online search engines spend lots of time developing the algorithms that produce search results. They also spend a great deal of time developing other features like maps, intelligent assistance, and flight search services to name a few. Cyber laws help these companies to take legal action as necessary to protect their trade secrets.

Contracts ***and*** ***Employment*** ***Law:***

Every time you click a button that says you agree to the terms and conditions of using a website, you have used cyber law. There are terms and conditions for every website that are somehow related to privacy concerns.

IT ACT 2000 SALIENT
FEATURES

- The Information Technology Act, 2000 or ITA, 2000 or IT Act, was notified on October 17, 2000.
- It is the law that deals with cybercrime and electronic commerce in India.
- In 1996, the United Nations Commission on International Trade Law (UNCITRAL) adopted the model law on electronic commerce (e-commerce) to bring uniformity in the law in different countries.
- Further, the General Assembly of the United Nations recommended that all countries must consider this model law before making changes to their own laws. India became the 12th country to enable cyber law after it passed the Information Technology Act, 2000.
- While the first draft was created by the Ministry of Commerce, Government of India as the E Commerce Act, 1998, it was redrafted as the 'Information Technology Bill, 1999', and passed in May 2000.

▪ Objectives of the Act

- Grant legal recognition to all transactions done via electronic exchange of data or other electronic means of communication or e-commerce, in place of the earlier paper-based method of communication.
- Give legal recognition to digital signatures for the authentication of any information or matters requiring legal authentication
- Facilitate the electronic filing of documents with Government agencies and also departments
- Facilitate the electronic storage of data
- Give legal sanction and also facilitate the electronic transfer of funds between banks and financial institutions
- Grant legal recognition to bankers under the Evidence Act, 1891 and the Reserve Bank of India Act, 1934, for keeping the books of accounts in electronic form.

Features of the Information Technology Act, 2000

- All electronic contracts made through secure electronic channels are legally valid.
- Legal recognition for digital signatures.
- Security measures for electronic records and also digital signatures are in place
- A procedure for the appointment of adjudicating officers for holding inquiries under the Act is finalized
- Provision for establishing a Cyber Regulatory Appellant Tribunal under the Act. Further, this tribunal will handle all appeals made against the order of the Controller or Adjudicating Officer.
- An appeal against the order of the Cyber Appellant Tribunal is possible only in the High Court

- Digital Signatures will use an asymmetric cryptosystem and also a hash function
- Provision for the appointment of the Controller of Certifying Authorities (CCA) to license and regulate the working of Certifying Authorities. The Controller to act as a repository of all digital signatures.
- The Act applies to offences or contraventions committed outside India
- Senior police officers and other officers can enter any public place and search and arrest without warrant
- Provisions for the constitution of a Cyber Regulations Advisory Committee to advise the Central Government and Controller.



thank you