



GOVT. P.G. COLLEGE FOR WOMEN
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1.1.1 The institution ensures effective curriculum delivery through a well- planned and documented process

DOCUMENTARY PROOF- USE OF ICT ENABLED TOOLS FOR CURRICULUM DELIVERY



GPS Map Camera



Rohtak, Haryana, India

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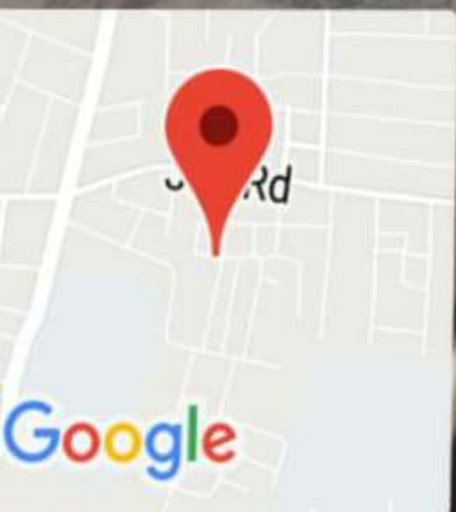
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GPS Map Camera



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424/13, Durga colony, Rohtak, Haryana 124001,
India

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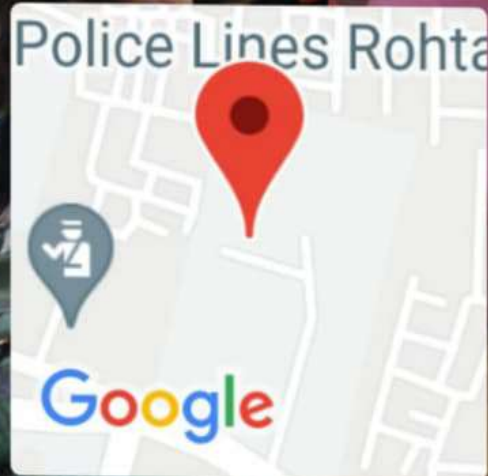
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GPS Map Camera



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Police Lines Rohtak



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India

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Police Lines Rohta





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Police Lines Rohta



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Google



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VHXV+XGG, Durga colony, Rohtak, Haryana 124001, India
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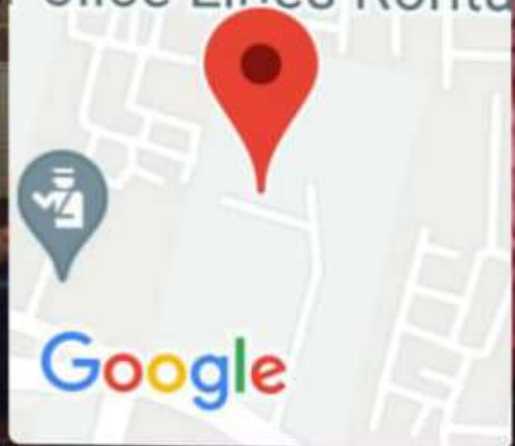
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GPS Map Camera

Police Lines Rohta



Rohtak, Haryana, India

VHXV+XGG, Durga colony, Rohtak, Haryana 124001, India

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GPS Map Camera

Police Lines Rohta



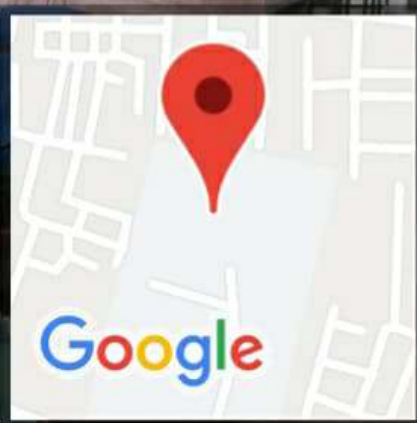
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VHXV+XGG, Durga colony, Rohtak, Haryana 124001, India

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VHXV+XGG, Durga colony, Rohtak,
Haryana 124001, India

13 May 2022, 11:27 am



Clear

43.1 °C
109.6 °F



GPS Map Camera

Rohtak, Haryana, India

VHXV+XGG, Durga colony, Rohtak, Haryana 124001, India


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Long 76.593859°

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 GPS Map Camera



Soninat Stand Rd

Rohtak, Haryana, India
VHXV+XGG, Durga colony, Rohtak, Haryana 124001, India
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Long 76.59384°
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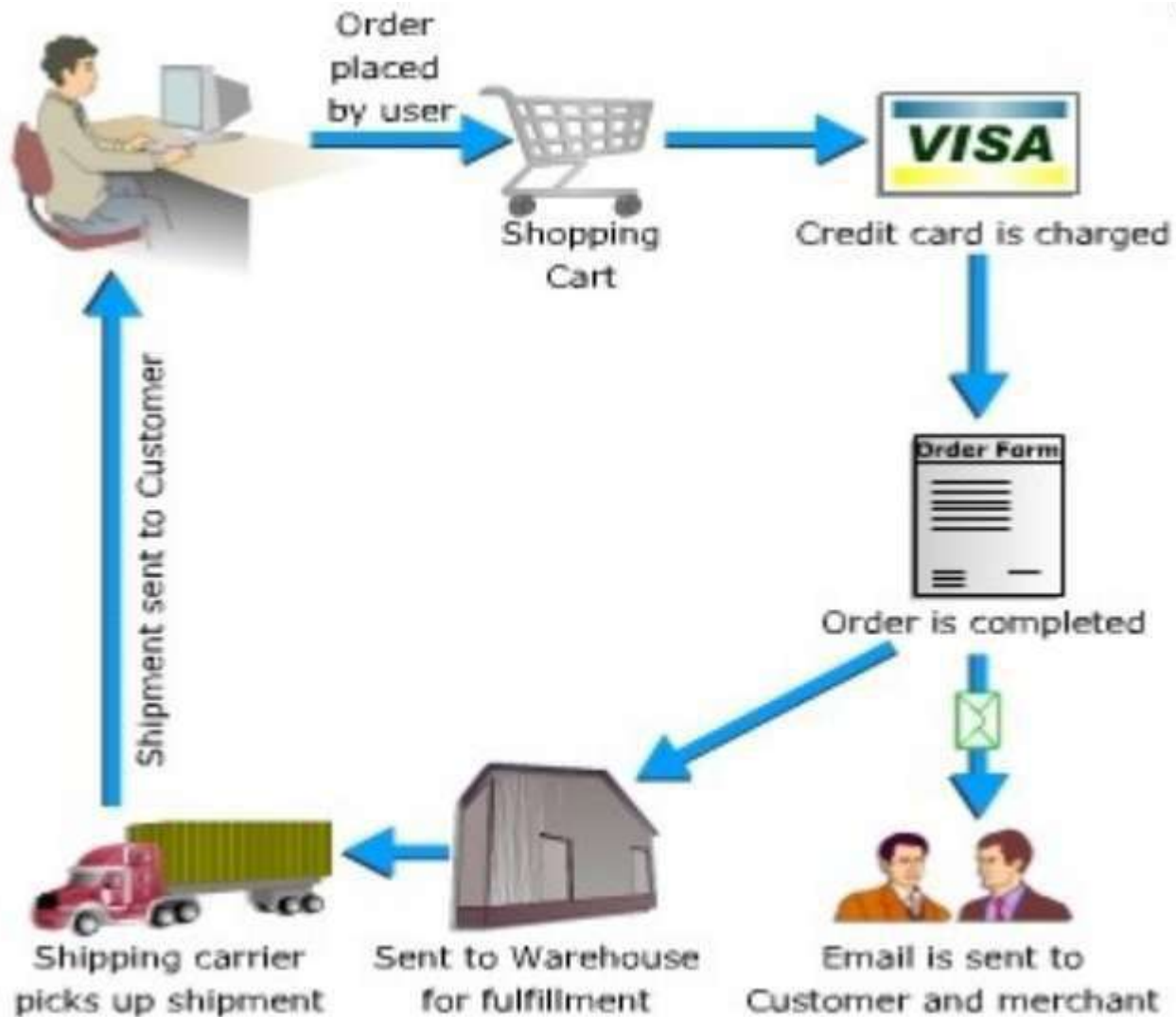
E-commerce

E-commerce

- The E-commerce is the movement of business on to the world wide web (www) or internet.
- This movement has been broken up into two main sectors:
 - 1. B2B: Business to Business
 - 2. B2C: Business to Consumer
- It comprises core business processes of buying, selling goods, services and information over the internet.

- It is commonly known as electronic marketing.
- It consist of buying and selling goods and services over an electronic system such as the internet.
- E-commerce is the purchasing , selling & exchanging goods and services over computer network or internet through which transactions or terms of sale are performed electronically.

Process of E-commerce



- A consumer uses Web browser to connect to the home page of a merchant's Web site on the Internet.
- The consumer browses the catalog of products featured on the site and selects items to purchase.
- The selected items are placed in the electronic equivalent
- of a shopping cart.
- When the consumer is ready to complete the purchase of selected items, she provides a bill-to and ship-to address for purchase and delivery.
- When the credit card number is validated and the order is completed at the Commerce Server site, the merchant's site displays a receipt confirming the customer's purchase.
- The Commerce Server site then forwards the order to a Processing Network for payment processing and fulfilment.

ADVANTAGES OF E-COMMERCE

- Faster buying/selling procedure, as well as easy to find products.
- Buying/selling 24/7.
- More reach to customers, there is no theoretical geographic limitations.
- Low operational costs and better quality of services.
- No need of physical company set-ups.
- Easy to start and manage a business.
- Customers can easily select products from different providers without moving around physically.

- Global Reach of customers.
- An extended enterprise is easy to build.
- **Disintermediation:** Through the internet, one can directly approach the customers and suppliers, cutting down the cost
- Improved customer service to your clients.
- A technology based customer Interface.
- The customer controls the interaction.
- Knowledge of customer behavior

DISADVANTAGES OF E-COMMERCE

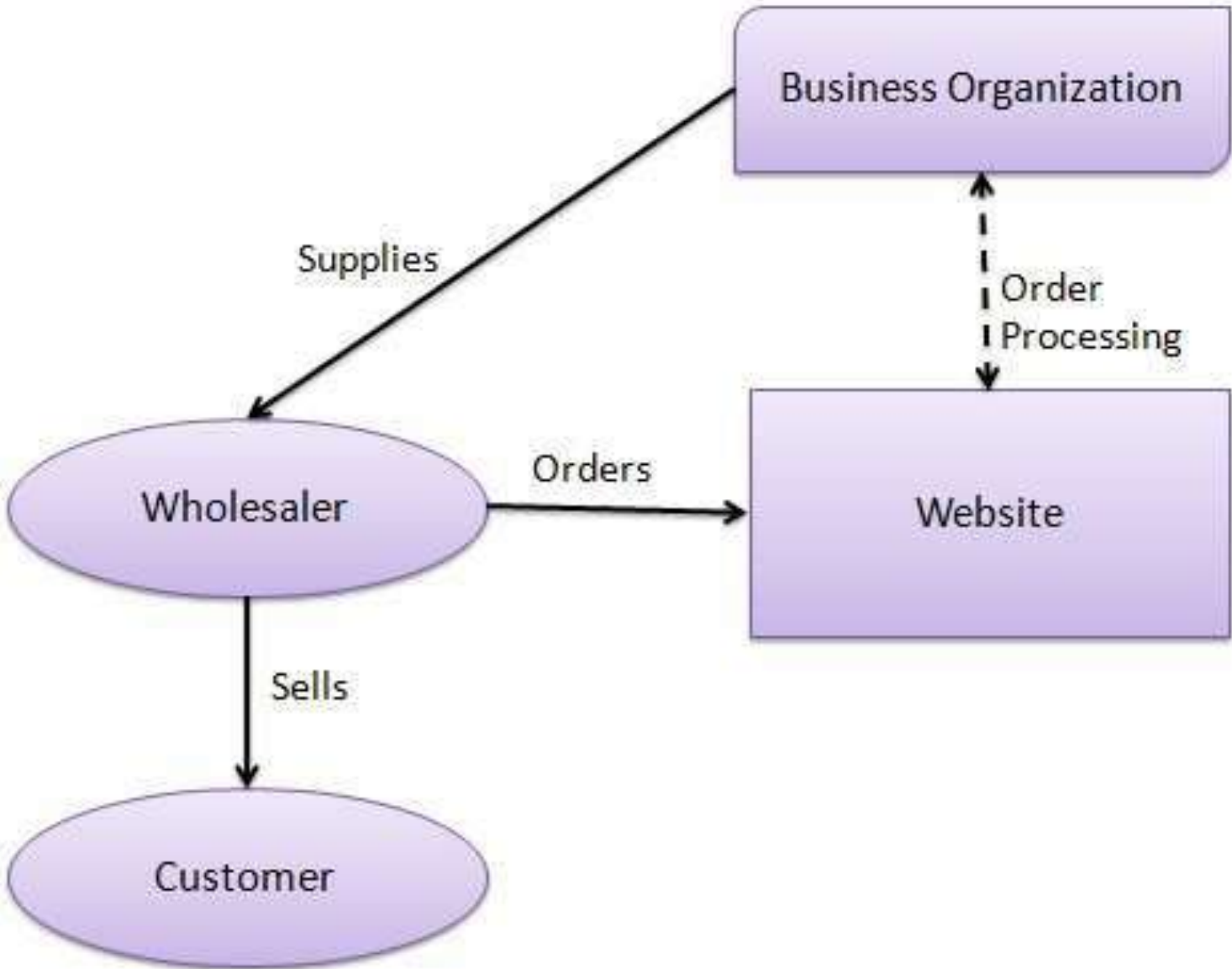
- Unable to examine products personally
- Not everyone is connected to the Internet
- There is the possibility of credit card number theft
- Mechanical failures can cause unpredictable effects on the total processes.

Types of E-commerce

- Business-to-business (B2B)
- Business-to-Consumer (B2C)
- Business-to-government (B2G)
- Consumer-to-consumer (C2C)
- Consumer-to-Business (C2B)
- Government to consumer (G2C)
- Government-to-business (G2B)

Business-to-business (B2B)

- B2B e-commerce is simply defined as e-commerce between companies.
- Sells products or services to other business or brings multiple buyers and sellers together in a central marketplace through the internet.
- Example:
 - Intel selling microprocessor to Dell
 - Heinz selling ketchup to Mc Donalds
 - SHOP2gether.com

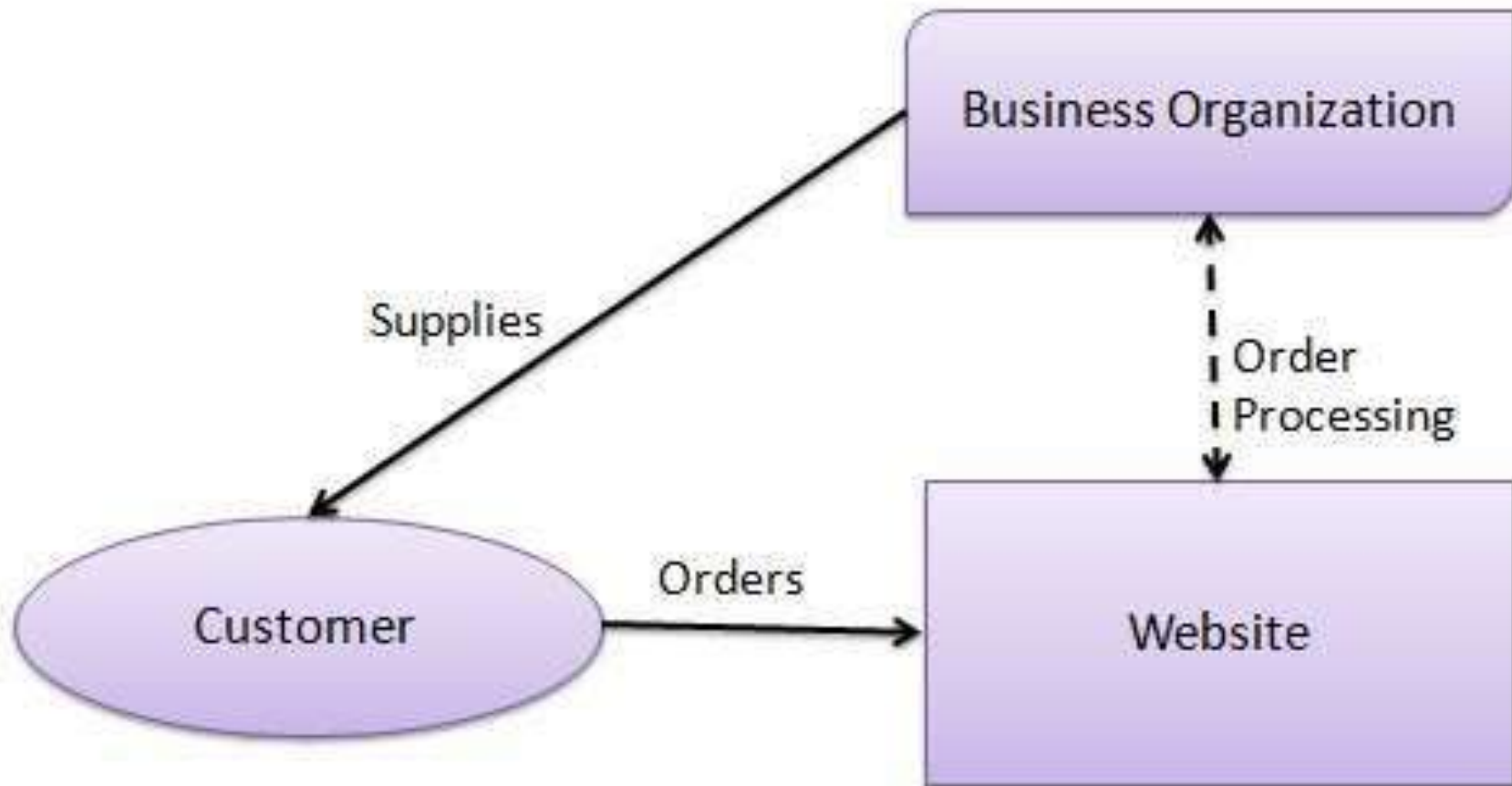


Advantages of B2B

- Direct Interaction with customers.
- Focused sales promotion: This information gives authentic data about the likes, dislikes and preferences of clients.
- Building customer loyalty
- Scalability: Web is open and offers round the clock.
- Saving in distribution cost.

B2C: Business-to-Consumer

- Business-to-consumer e-commerce, or commerce between companies and consumers, involves customers gathering information; purchasing physical goods or receiving products over an electronic network.
- Example:
- Dell selling me a laptop



- B2C business model include virtual malls which are websites that hosts many online merchants.
- E- tailers that offer web specific products or services only over the Internet are known as virtual merchants.

Advantages of B2C

- Inexpensive , big opportunity
- Globalization
- Reduced operational cost
- Customer convenience

B2G

- Business-to-government e-commerce or B2G is generally defined as commerce between companies and the public sector.
- It refers to the use of the Internet for public procurement, licensing procedures, and other government related operations.
- **Example:**
- Business pay taxes, file reports, or sell goods and services to Govt. agencies.

Business Organization



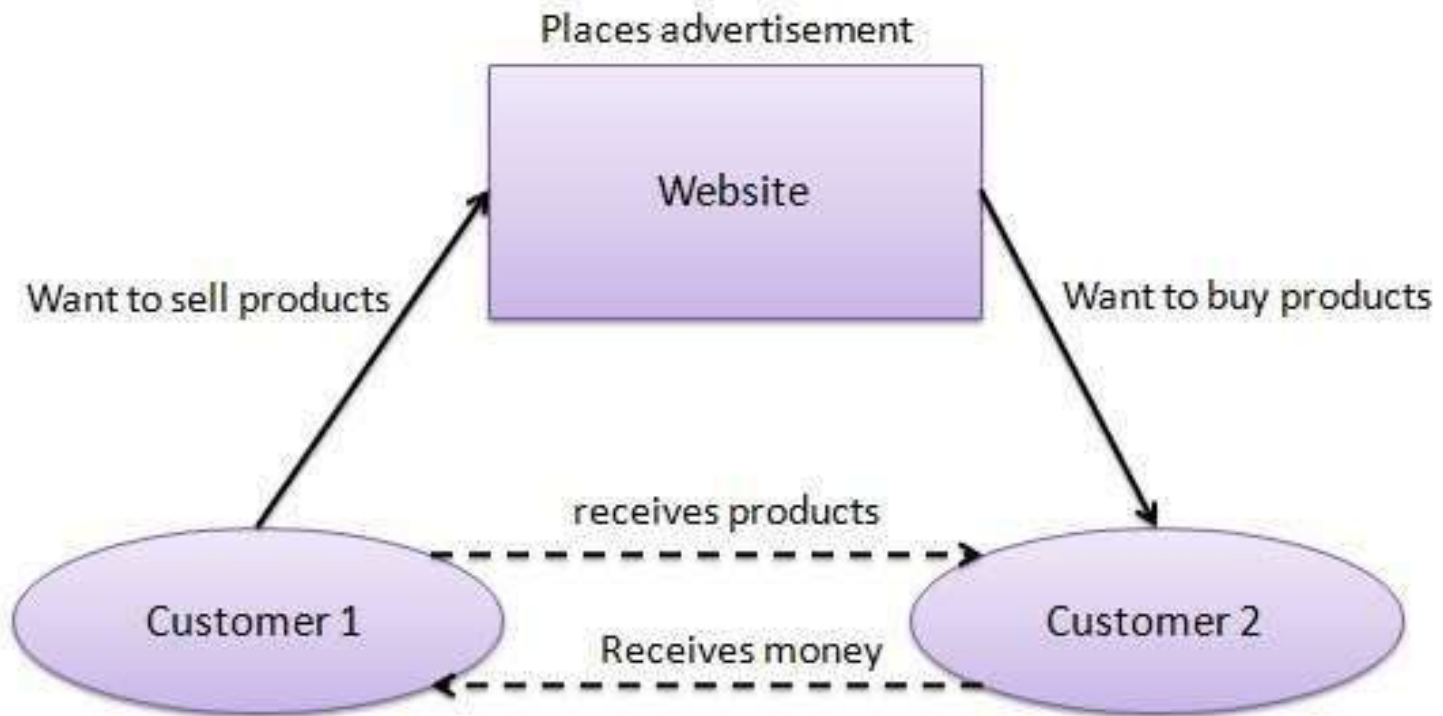
Website



Government

C2C ecommerce

- Consumer-to-consumer e-commerce or C2C is simply commerce between private individuals or consumers.
- **Example:**
- Mary buying an iPod from Tom on eBay
- Me selling a car to my neighbor



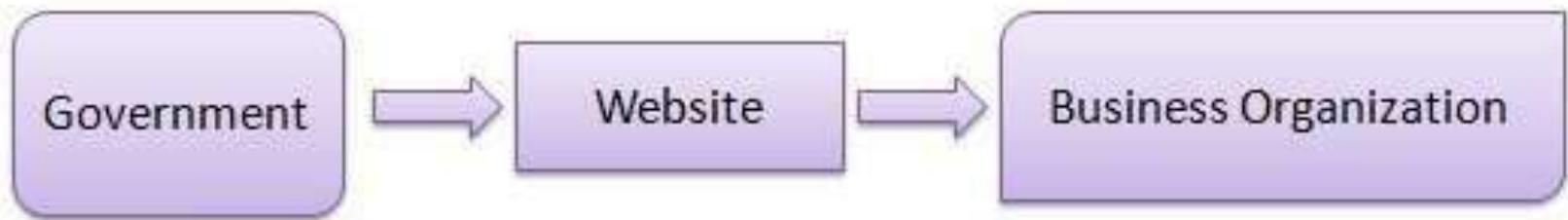
G2C E-commerce

- This Model is also a part of **e-governance**.
- The objective of this model is to provide **good and effective services** to each citizen.
- The Government provides the following facilities to the citizens through website.
- Information of all government departments, Different welfare schemes, Different application forms to be used by the citizens.



G2B E-commerce

- Government-to-business (G2B) is a business model that refers to government providing services or information to business organization.
- Government uses B2G model website to approach business organizations. Such websites support auctions, tenders and application submission functionalities.



Consumer-to-Business (C2B)

- In the c2B model the customers offers products or services to businesses.
- Customer Reviews, participants in focus group or sharing as an influencer.
- It is type of revers auction, which enables buyers to name or demand their own price for a specific good or service.
- Also electronic ecommerce is a form of C2B. Here consumers can offer product and services to the company and company can pay for it.

- It works in blogs or Internet forums in which author offers a link to online business and facilitate the purchase of the product.
- E..g Elance is the first C2B e-commerce website.

E-Commerce Applications

- **Retail and wholesale:**
- **Marketing:**
- **Finance:**
- **Manufacturing:**
- **Auctions:**

Retail and wholesale

- E-retailing or on-line retailing is the selling of goods from Business-to-Consumer through electronic stores that are designed using the electronic catalog and shopping cart model.
- Cybermall is a single Website that offers different products and services at one Internet location. It attracts the customer and the seller into one virtual space through a Web browser.
- The wholesale is a B2B model while retail is a B2C model.
- In wholesale we do not sell product directly to the consumers.
- In a retailing model, we receive products from distributors and sell products directly to the consumers.

Marketing

- Marketing is the action of promoting and selling products or services including market research or advertising.
- Data collection about customer behavior, preferences, needs and buying patterns is possible through Web and E-commerce.
- This helps marketing activities such as price fixation, negotiation, product feature enhancement and relationship with the customer.

Finance

- The Finance is the management of large amount of money , especially by government or large companies.
- E-commerce financing is a funding solution that provides working capital for web based business.
- It includes lines of credit, micro loans and invoice factoring.
- Customers can check the balances of their savings and loan accounts, transfer money to their other account and pay their bill through on-line banking or E-banking.
- Another application of E-commerce is on-line stock trading. Many Websites provide access to news, charts, information about company profile and analyst rating on the stocks.
- E.g. Velotrade is an online financial institute .

Manufacturing

- E-commerce is also used in the supply chain operations of a company.
- Some companies form an electronic exchange by providing together buy and sell goods, trade market information and run back office information such as inventory control.
- This speeds up the flow of raw material and finished goods among the members of the business community.

Manufacturing continued

- E-commerce is a technique for manufacturers to experiment with new products without risking a significant investment.
- Instead of setting up brick and mortar stores or keeping inventory on hand, we can start offering this new product on our new store online.

Auctions

- Customer-to-Customer E-commerce is direct selling of goods and services among customers.
- It also includes electronic auctions that involve bidding.
- Bidding is a special type of auction that allows prospective buyers to bid for an item.

Others

- Internet Bookshop
- Grocery Supplies
- Electronic Newspaper
- Internet banking

The e-Commerce Process

- The e-Commerce process flow describes all the steps and functionality that makes an e-Commerce website work.



The Backend

- The backend is the business-facing side of an e-Commerce website. You'll often see it referred to as the dashboard, the control panel, or the admin panel.
- The backend includes tools for website setup and business management. Users can upload products, organize them into categories, and choose which payment methods to accept.
- Many e-Commerce platforms offer online store templates to make design fast and easy. Other features can include inventory tracking and control, order processing, marketing tools, a coupon and promotion creator, customer records, and more.

The Frontend

- The frontend is the consumer side of an e-Commerce website, and comprises everything the customer sees when they shop.
- The frontend is also called the storefront, and generally when people refer to "the website," they're speaking about the frontend.
- The appearance and functionality of the frontend is a direct result of the options you set up in the backend.
- You can enhance the frontend with other features, like product reviews and Q&As, security logos and other trust badges, the ability for customers to view, edit, and save their cart, and more.

Find a Product

- Your choice of products to sell should be based on a few factors.
- You may already know what you want to sell — perhaps you make crafts at home, or maybe you want to use a print-on-demand service to start a line of T-shirts.

Product Sourcing

- Product sourcing refers to where and how you get the products you're going to sell on your website.
- The best method for sourcing depends on the details of your business.

Build a Website

- Once you've laid out the plans for your business and you're ready to get going, it's time to build your website.
- You can start work on the site at any point in the process as long as it will be ready to launch on time according to the schedule you've set.

Market Your Website

- Marketing is an essential part of the e-Commerce process flow because it's how you raise brand awareness and bring customers to your store.
- You should have a marketing plan in place before you launch your website, as some aspects (like SEO) need to be in place immediately.

Search Engine Optimization (SEO)

- SEO is listed first because it has the most potential — which makes it the most important.
- The majority of online shopping starts with a search engine, as customers search for what they need and then compare results across multiple businesses.

Social Media Marketing

- Social media is enormously popular and you're missing out if you don't work it into your marketing strategy.
- The most obvious example is to connect your store to Facebook.
- Start by creating a Business Page that will serve as the social media presence of your brand, and link it back to your website.

Payment Gateways

- Online payment gateways are the technology that makes this possible. A payment gateway authorizes a credit card (or other) transaction near-instantaneously.
- Other than this basic functionality, no two payment gateways are exactly the same.
- Pricing, policies, and other factors come into play, so it's important to choose the right payment gateway for your business.

Electronic Payment System

- To transfer money over the Internet
- Methods of traditional payment
 - – Check, credit card, or cash
- Methods of electronic payment
 - – Electronic cash, software wallets, smart cards, and credit/debit cards

- An **e-payment** system is a way of making transactions or paying for goods and services through an electronic medium, without the use of checks or cash.
- It's also called an electronic payment system or online payment system

Requirements for e-payments

- Atomicity
 - – Money is not lost or created during a transfer
- Good atomicity
 - – Money and good are exchanged atomically
- Non-repudiation
 - – No party can deny its role in the transaction

Desirable Properties of Digital Money

- Universally accepted
- Transferable electronically
- Private (no one except parties know the amount)
- Anonymous (no one can identify the payer)

Types of E-payments

- E-cash
- Electronic wallets
- Smart card
- Credit card
- Debit card

METHODS OF ELECTRONIC PAYMENT SYSTEM

1. Credit Payment System

Credit Card — A form of the e-payment system which requires the use of the card issued by a financial institute to the cardholder for making payments online or through an electronic device, without the use of cash.

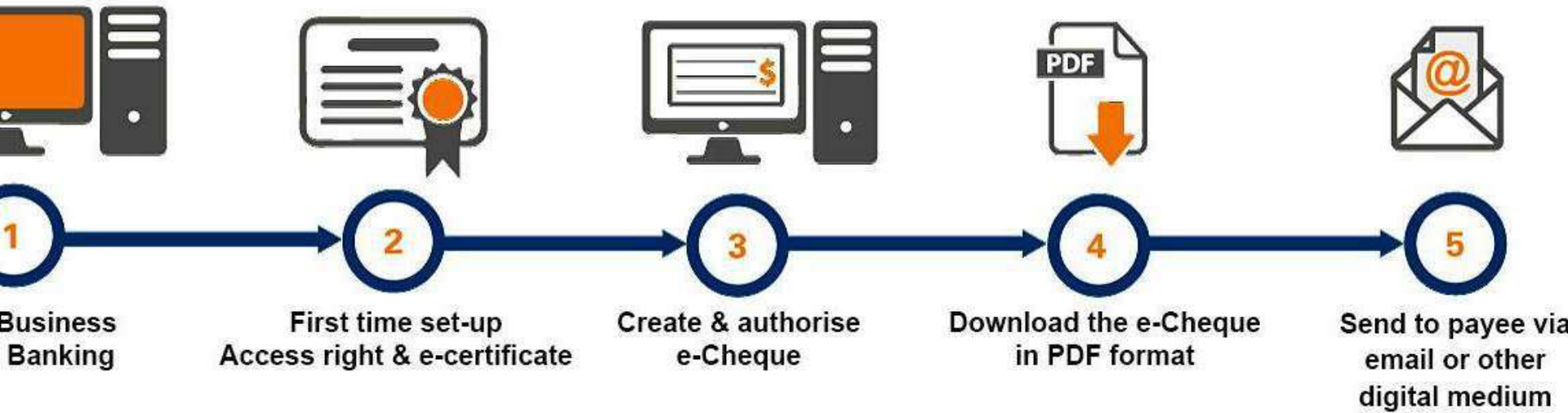
E-wallet — A form of prepaid account that stores user's financial data, like debit and credit card information to make an online transaction easier.

Smart card — A plastic card with a microprocessor that can be loaded with funds to make transactions; also known as a chip card.

2. Cash Payment System

- **Direct debit** — A financial transaction in which the account holder instructs the bank to collect a specific amount of money from his account electronically to pay for goods or services.
- **E-cheque** — A digital version of an old paper cheque. It's an electronic transfer of money from a bank account, usually checking account, without the use of the paper cheque. In it a certain amount of money is stored on a client's device and made accessible for online transactions. These are signed by the payer and endorsed by the payee. These are affixed with digital signature.
- **Stored-value card** — A card with a certain amount of money that can be used to perform the transaction in the user store. A typical example of stored-value cards are gift cards.

Business Internet Banking



Advantages of electronic payment systems

- (i) Time savings- Money transfer between virtual accounts usually takes a few minutes, while a wire transfer or a postal one may take several days. Also, you will not waste your time waiting in lines at a bank or post office.
- (ii) Expenses control- Even if someone is eager to bring his disbursements under control, it is necessary to be patient enough to write down all the petty expenses, which often takes a large part of the total amount of disbursements.
- The virtual account contains the history of all transactions indicating the store and the amount you spent. And you can check it anytime you want. This advantage of electronic payment system is pretty important in this case.

- (iii) Reduced risk of loss and theft- You can not forget your virtual wallet somewhere and it can not be taken away by robbers.
- Although in cyberspace there are many scammers.
- **(iv) Low commissions-** If you pay for internet service provider or a mobile account replenishment through the UPT (unattended payment terminal), you will encounter high fees. As for the electronic payment system: a fee of this kind of operations consists of 1% of the total amount, and this is a considerable advantage.

- **(v) User-friendly-** Usually every service is designed to reach the widest possible audience, so it has the intuitively understandable user interface.
- In addition, there is always the opportunity to submit a question to a support team, which often works 24/7. Anyway you can always get an answer using the forums on the subject.
- **(vi) Convenience-** All the transfers can be performed at anytime, anywhere. It's enough to have an access to the Internet.

Disadvantages of electronic payment systems

- (i) Restrictions- Each payment system has its limits regarding the maximum amount in the account, the number of transactions per day and the amount of output.
- (ii) The risk of being hacked- If you follow the security rules the threat is minimal, it can be compared to the risk of something like a robbery.
- The worse situation when the system of processing company has been broken, because it leads to the leak of personal data on cards and its owners.
- Even if the electronic payment system does not launch plastic cards, it can be involved in scandals regarding the Identity theft.

- **The problem of transferring money between different payment systems-** Usually the majority of electronic payment systems do not cooperate with each other. In this case, you have to use the services of e-currency exchange, and it can be time-consuming if you still do not have a trusted service for this purpose.
- **(iii) The lack of anonymity-** The information about all the transactions, including the amount, time and recipient are stored in the database of the payment system. And it means the intelligence agency has an access to this information. You should decide whether it's bad or good.
- **(vi) The necessity of Internet access-** If Internet connection fails, you can not get to your online account.

Electronic Cash

- Primary advantage is with purchase of items less than 10 Rs
- – Credit card transaction fees make small purchases unprofitable
- – Micropayments
- Payments for items costing less than \$1

E-cash Concept

1. Consumer buys e-cash from Bank
2. Bank sends e-cash bits to consumer (after charging that amount plus fee)
3. Consumer sends e-cash to merchant
4. Merchant checks with Bank that e-cash is valid
5. Bank verifies that e-cash is valid
6. Parties complete transaction: e.g., merchant present e-cash to issuing bank for deposit once goods or services are delivered.

Advantages and Disadvantages of Electronic Cash

- **Advantages**

- – More efficient, eventually meaning lower prices
- – Lower transaction costs
- – Anybody can use it, unlike credit cards, and does not require special authorization

- • **Disadvantages**

- – Susceptible to forgery

Past and Present E-cash Systems

- **CyberCash**
- **CyberCoins**
- **DigiCash**
- **Coin.Net**

Electronic Wallets

- **Stores credit card, electronic cash, owner identification and address**
- – Makes shopping easier and more efficient
- Eliminates need to repeatedly enter identifying information into forms to purchase
- Works in many different stores to speed checkout
- – Amazon.com one of the first online merchants to eliminate repeat form-filling for purchases

An Electronic Checkout Counter Form

Please fill in the information below. Items in red are required for us to process your order. You can submit this form online, or if you are concerned about online security, you can call our Customer Service department at 1-800-468-5846 (or 408-325-7000 for orders originating outside the US) and place your order over the phone. Our Customer Service hours are 6:00AM until 5:00PM, Monday through Friday, Pacific Standard Time.

We are currently experiencing shipping delays of up to 84 hours. For faster delivery, please place your order with our Customer Service Department at 1(800)468-5846. We apologize for any inconvenience this may cause.

Step 3: Email Address

Enter your email address. Note that all order confirmations, order tracking, etc is emailed to this address. Please double check your e-mail address; this is our only means of communicating with you regarding your order.

Email

Step 4: Billing Address

Please give us your billing address and contact information.

First Name

Last Name

Company

Address1

Address2

City

State (US only) State or Province (Non-US Only) Zip/Postal Code

Country

Phone Fax

FIGURE 7-9 *A typical electronic checkout counter form*

Types of Electronic Wallets

- **Agile Wallet**
- Developed by CyberCash
- Allows customers to enter credit card and identifying information once, **stored on a central server**
- Information pops up in supported merchants' payment pages, allowing one-click payment
- Does not support smart cards or CyberCash, but company expects to soon
- **eWallet**
- Developed by Launchpad Technologies
- Free wallet software that stores credit card and **personal information on users' computer**, not on a central server; info is dragged into payment form from eWallet
- Information is encrypted and password protected
- Works with Netscape and Internet Explorer

- Microsoft Wallet
- – Comes pre-installed in Internet Explorer 4.0, but not in Netscape
- – All information is encrypted and password protected
- – Microsoft Wallet Merchant directory shows merchants setup to accept Microsoft Wallet

Entering Information Into Microsoft Wallet

Credit Card Information

VISA Otis' Visa

Enter your credit card information and accept or change the display

Credit card information

Name on the card: Expiration date:

Number:
 - - -

Some older cards have only 13 digits. If your card has only 13 digits, check the box below.

Only display 13 digits

Display name

The display name represents this credit card (i.e., Dad's Personal Visa, Dad's Work Visa).

< Back Next > Cancel

FIGURE 7-10

Entering credit card information into Microsoft Wallet

Smart Cards



- **Plastic card containing an embedded microchip**
- **Available for over 10 years**
- **success depends on:**
 - – Critical mass of smart cards that support applications
 - – Compatibility between smart cards, card-reader devices, and applications

- **Magnetic stripe**
- – 140 bytes,
- Memory cards
- – 1-4 KB memory, no processor,
- **Optical memory cards**
- – 4 megabytes read-only (CD-like),
- • Microprocessor cards
- – **Embedded microprocessor**
- o (OLD) 8-bit processor, 16 KB ROM, 512 bytes RAM
- o Equivalent power to IBM XT PC, cost \$7.00-15.00

Smart Card Applications

- Ticketless travel
- • Authentication, ID
- • Medical records
- • E-cash
- • Personal profiles
- Government
- – Licenses
- Mall parking

Advantages and Disadvantages of Smart Cards

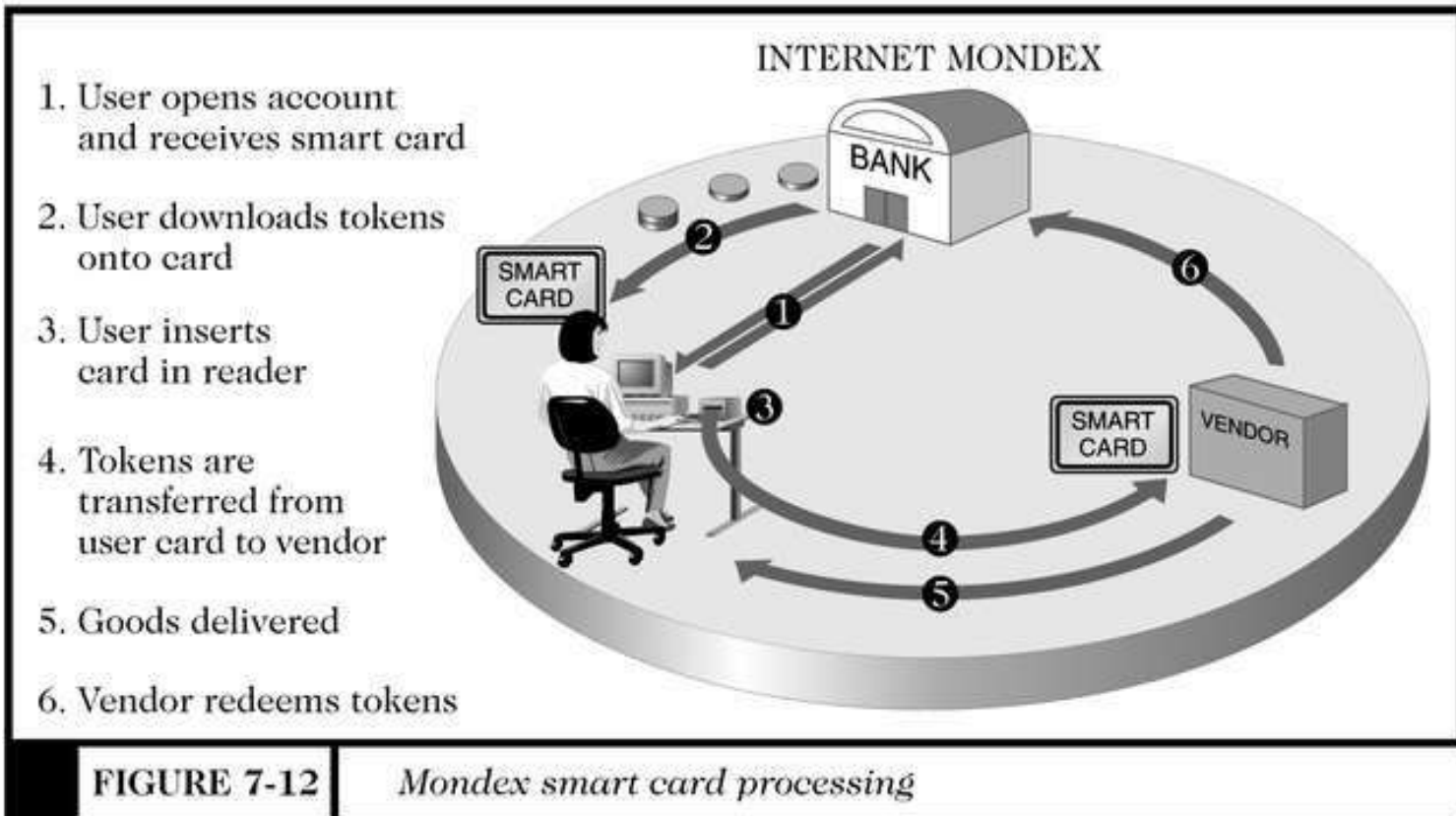
- Advantages:
 - 1. Atomic, debt-free transactions
 - 2. Feasible for very small transactions (information commerce)
 - 3. anonymous
 - 4. Security of physical storage
 - 5. currency-neutral
- • Disadvantages:
 - 1. Low maximum transaction limit (not suitable for B2B or most B2C)
 - 2. High Infrastructure costs (not suitable for C2C)
 - 3. Not (yet) widely used

Mondex Smart Card



- Holds and dispenses electronic cash (Smart-card based, stored-value card)
- Developed by MasterCard International
- Requires specific card reader, called Mondex terminal, for merchant or customer to use card
- over Internet
- Supports micro-payments and works both online and off-line at stores or over the telephone
- Secret chip-to-chip transfer protocol

Mondex Smart Card Processing



Credit Cards



- Used for the majority of Internet purchases
- – Has a preset spending limit
- – Currently most convenient method
- – Most expensive e-payment mechanism
- MasterCard: \$0.29 + 2% of transaction value
- – Disadvantages
- Does not work for small amount
- (too expensive)

credit card system

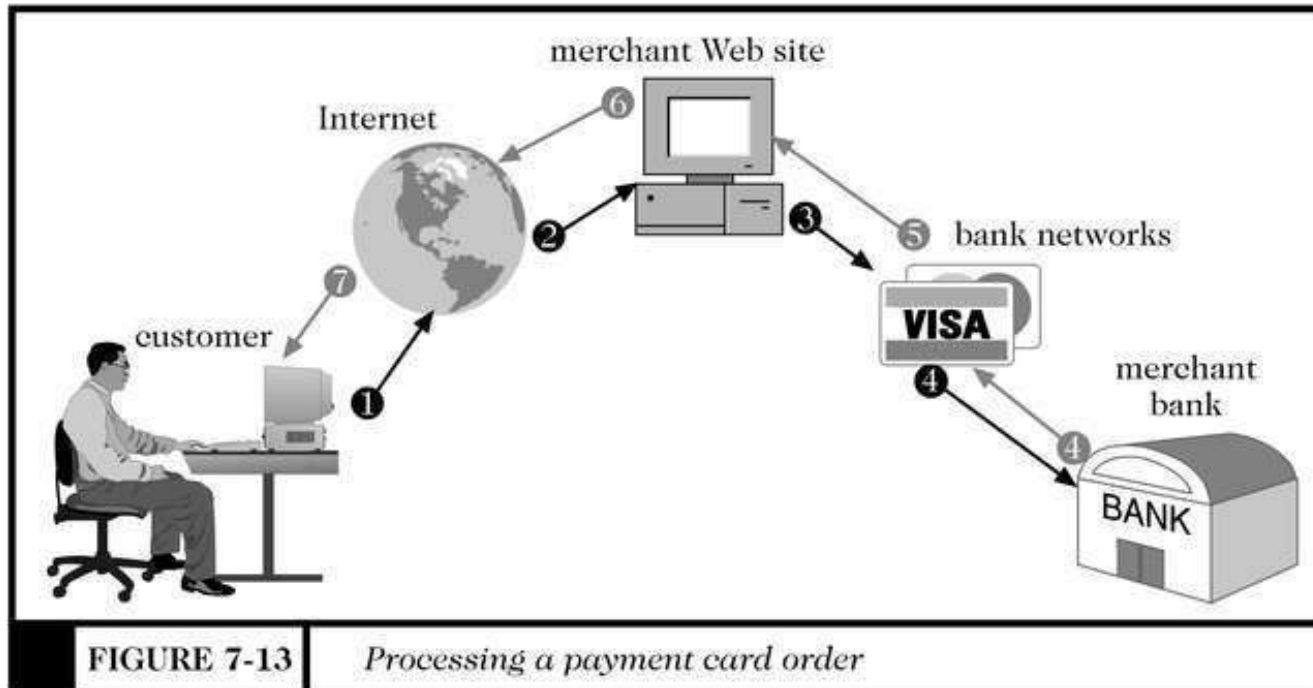
- Following are the actors in the credit card system.
- **The card holder** – Customer
- **The merchant** – seller of product who can accept credit card payments.
- **The card issuer bank** – card holder's bank
- **The acquirer bank** – the merchant's bank
- **The card brand** – for example , visa or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

Credit Card Payment Process

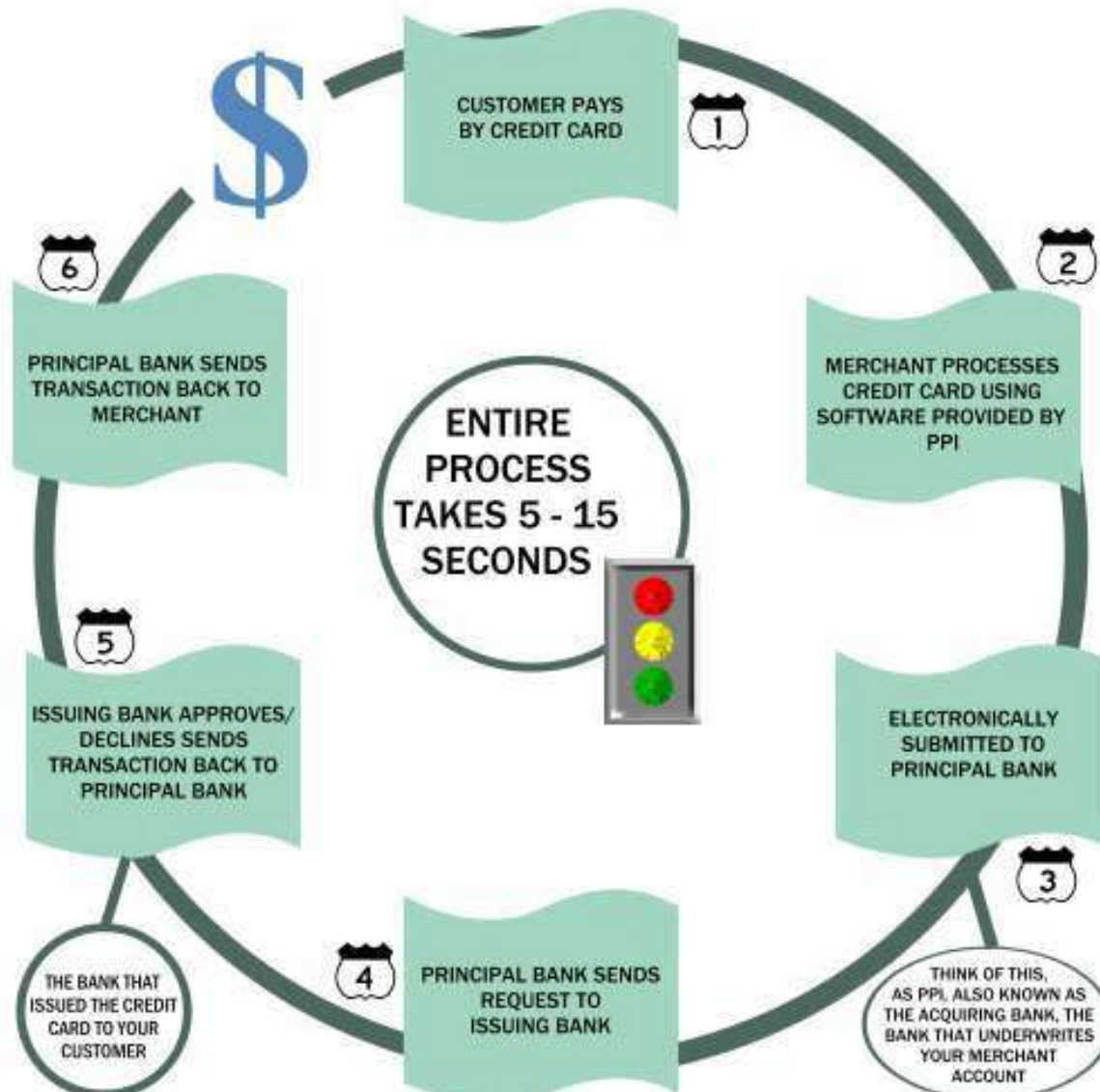
- Step 1 Bank issues and activates a credit card to the customer on his/her request.
- Step 2 The customer presents the credit card information to the merchant site or to the merchant from whom he/she wants to purchase a product/service.
- Step 3 Merchant validates the customer's identity by asking for approval from the card brand company.

- Step 4: Card brand company authenticates the credit card and pays the transaction by credit. Merchant keeps the sales slip.
- Step 5: Merchant submits the sales slip to acquirer banks and gets the service charges paid to him/her.
- Step 6: Acquirer bank requests the card brand company to clear the credit amount and gets the payment.
- Step 6: Now the card brand company asks to clear the amount from the issuer bank and the amount gets transferred to the card brand company.

Processing a Payment Card Order



Credit Card Processing



Debit Card



- A **debit card** is a plastic card which provides an alternative payment method to cash when making purchases.
- Physically the card is an ISO 7810 card like a credit card.

- Depending on the store or merchant, the customer may swipe or insert their card into the terminal, or they may hand it to the merchant who will do so.
- The transaction is authorized and processed and the customer verifies the transaction either by entering a PIN or, occasionally, by signing a sales receipt.

Credit card VS Debit card

- You can obtain credit in credit card but not in debit card.
- Credit card charges interest for using the bank's money. (debit card is free from this problem)

Electronic Fund Transfer

- It is a very popular electronic payment method to transfer money from one bank account to another bank account.
- Accounts can be in the same bank or different banks. Fund transfer can be done using ATM (Automated Teller Machine) or using a computer.

- Nowadays, internet-based EFT is getting popular. In this case, a customer uses the website provided by the bank, logs in to the bank's website and registers another bank account.
- He/she then places a request to transfer certain amount to that account. Customer's bank transfers the amount to other account if it is in the same bank, otherwise the transfer request is forwarded to an ACH (Automated Clearing House) to transfer the amount to other account and the amount is deducted from the customer's account.
- Once the amount is transferred to other account, the customer is notified of the fund transfer by the bank.

- NEFT: National electronic fund transfer
- RTGS: Real Time gross settlement
- IMPS means immediate payment service

INFORMATION TECHNOLOGY

- Information technology (IT) is the use of computers to store, retrieve, transmit, and manipulate data or information.
- IT is typically used within the context of business operations as opposed to personal or entertainment technologies.
- IT is considered to be a subset of information and communications technology (ICT).
- An information technology system (IT system) is generally an information system, a communications system or, more specifically speaking, a computer system – including all hardware, software and peripheral equipment (keyboard, mouse, screen, speaker, printer)– operated by a limited group of users.

Impact of IT on Business

- Information technology helps in developing automated processes for businesses. This not only helps in reducing the cost of operation but also saves time. The time saved can be utilized to focus on other tasks, thus speeding up business processes significantly.
- Processes like billing, tracking metrics, collecting customer data, monitoring certain processes etc. can be automated easily. There are numerous automation software that can be utilized for this purpose.

- Business technology helps small businesses improve their communication processes. Emails, texting, websites and apps, for example, facilitate improved communication with consumers. Using several types of information technology communication methods enable companies to saturate the economic market with their message.

- The concept of cloud computing is immensely popular among businesses owing to the efficiency in business operations that it provides. Cloud computing utilizes information technology to capitalize on its ability to provide improved agility and time and resource management for businesses.

Working Remotely

- Implementation of information technology provides the ability to remotely access your company's network.
- As a result, it equips employees with the ability to get the work done even if they are not physically present at the workplace.

Mobile Technology

- Mobile technology takes business communication to a whole new level. A mobile team can improve the workplace productivity considerably. There are numerous ways to integrate mobile technology in the workplace.

Protecting Information

- Every organization has a mammoth database comprising various information related to business transactions, client details and so on. Such information is extremely valuable to a business and can cause a host of legal issues if it is lost. This is where information technology becomes relevant. It provides the right resources to store the information in a way that ensures maximum protection.
- Virtual storage systems can keep information safe by allowing a limited number of users to access these. Increased protection also ensures that these systems are not hacked and the information is not wiped out owing to some problems. Therefore, information technology helps in upholding business integrity.

Providing Customer Satisfaction

- Customer experience and satisfaction are crucial aspects of all businesses. The key to customer satisfaction is a strong customer support team and its availability to cater to the requirements of the customers.
- Information technology provides the best tools for communicating with customers and solving their problems in real time. It has unlocked the facilities like Email, social media and other messaging platforms for this purpose.
- A happy customer-base is important for the growth of a business. Various cloud-based communication channels have made customer experience more improved.

Management of Resources

- A business has a variety of resources. These may include financial resources, human resources and so on. For large organizations, managing resources becomes quite difficult. Information technology plays a vital role in managing these resources effortlessly by introducing a wide range of feasible solutions.
- For example, the integration of Enterprise Resource Planning (ERP) has improved the efficiency of various business processes. ERP is a business management software that enables an organization to use a series of integrated applications that can manage and automate various business operations.
- Information technology is at the core of such software. The implementation of ERP is progressing at a rapid rate with more and more businesses implementing this efficient technology to make certain business processes hassle-free.

Open Source Software

- Information technology has paved the way for various open source software that allow free usage of certain tools for various organizations. The primary benefit of open source software is its flexible license. This allows modifications to the source code. This means that you have the facility to customize its functions according to your requirements.
- Almost every software that businesses use has open source variants that are widely available on the Internet. Utilizing these could mean multiple benefits at reduced expenses.

**FOOD CHAIN
AND
FOOD WEB**

FOOD CHAIN

IT IS SERIES OF ORGANISM CALLED
TROPHIC LEVEL IN WHICH THERE
REPEATING
EATING AND EATEN BY SO AS TO TRANSMIT
THE FOOD ENERGY

Characteristics

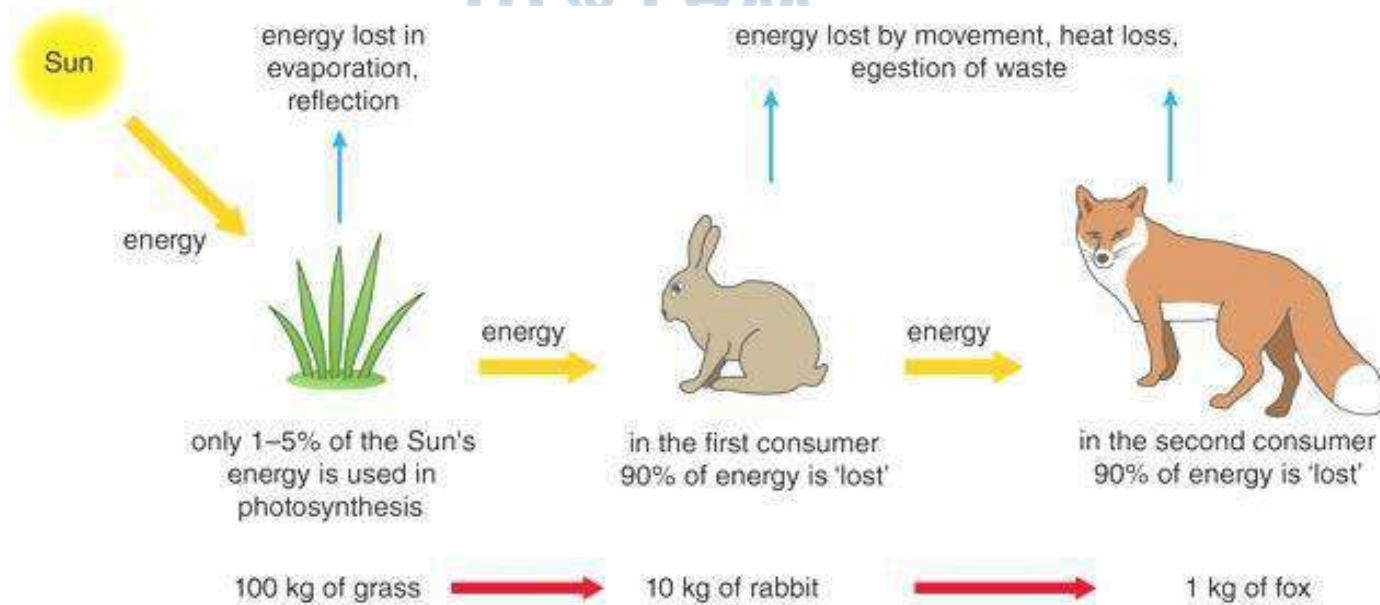
- NUTRITIVE INTERACTION
- PLANT N ANIMAL INTERDEPENDENT
- UNIDIRECTIONAL FLOW OF ENERGY
- 80 \ 90 %POTENTIAL ENERGY IS LOST
- NO OF CONSUMER N PRODUCER IS RELATED
- SHORTER CHAIN PROVIDE MORE ENERGY
- FOLLOW TO LAW OF THERMODYNAMICS
- ... ORGANISM MAY OCCUPY MORE THAN ONE TROPIC LEVEL

FIRST LAW

LAW OF CONSERVATION OF ENERGY

SECOND LAW

10% LAW

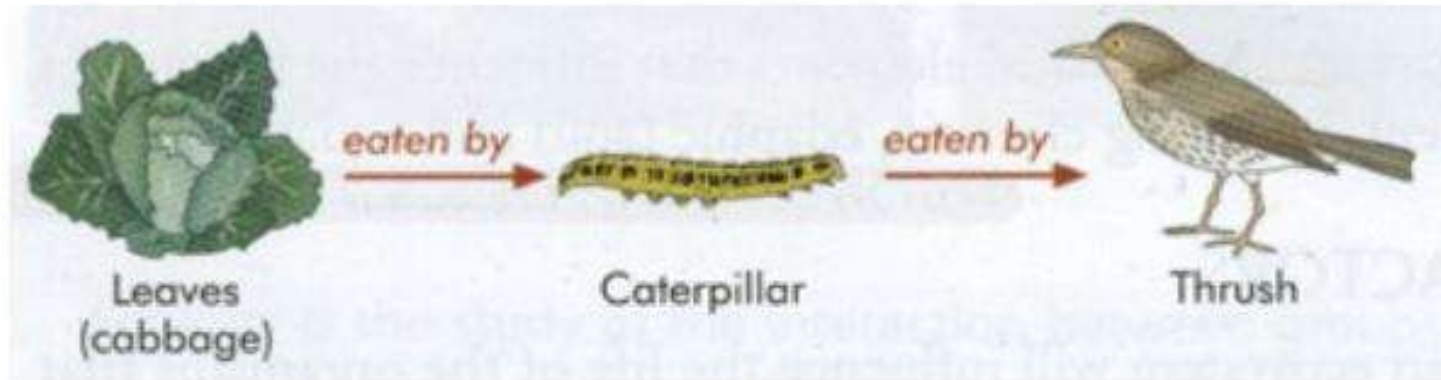


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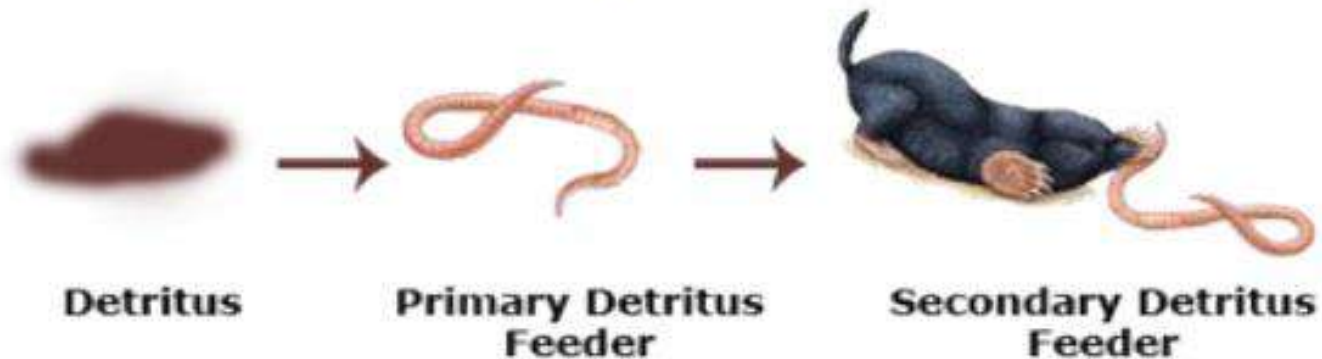
Trophic Levels

- Feeding relationships and therefore the flow of energy can be represented as a food chain. Each link in the chain is called a **trophic level** ('*trophic*' meaning '*feeding*')
- Each trophic level is the same number of steps from the Sun:
 - **Producers** (Autotrophs) are the 1st Trophic Level
 - **Herbivores** are the 2nd Trophic Level
 - **Carnivores** are the 3rd/4th/5th Trophic Levels
- Most Animals (carnivores) feed at more than one Trophic Level
- In most ecosystems the feeding relationships (and the transfer of energy) are represented more accurately by a **food web**

Grazing and Detritus Food Chain



Grazing Food Chain

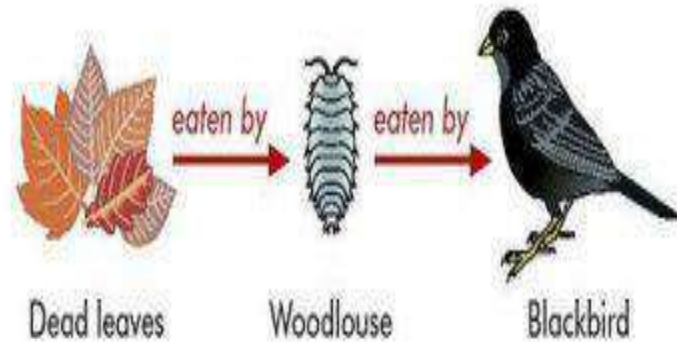
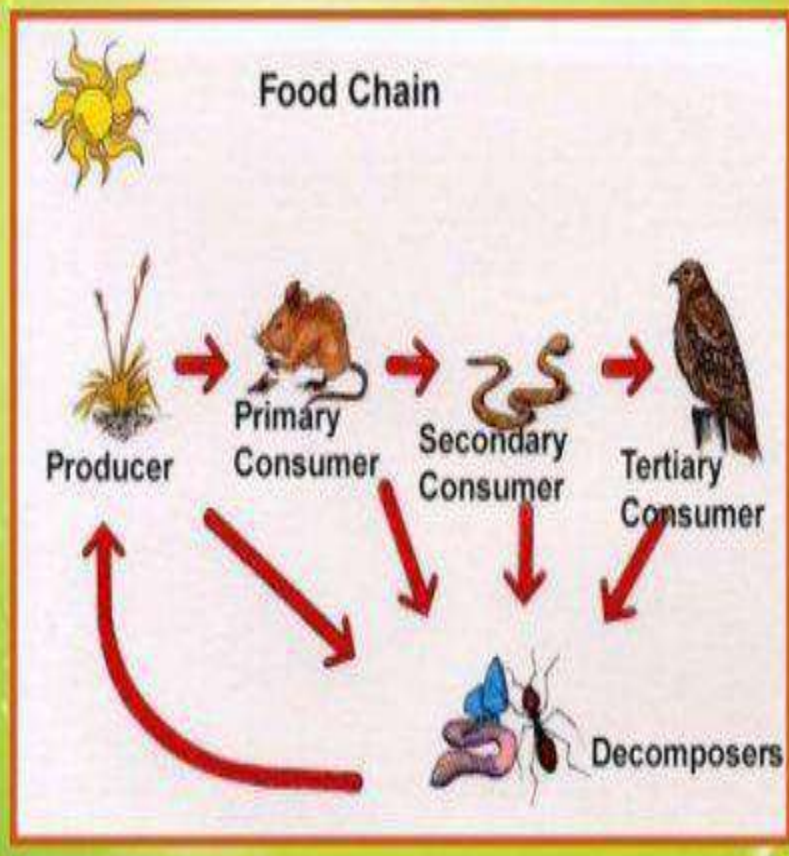


Detritus (**Dead organic matter**) Food Chain

GRAZING FOOD CHAIN

VS

DETRITUS FOOD CHAIN





Carnivore



Carnivore



Carnivore



Herbivore



Plant

Quaternary consumers

Tertiary consumers

Secondary consumers

Primary consumers

Primary producers



Carnivore



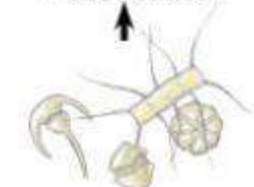
Carnivore



Carnivore



Zooplankton



Phytoplankton

A terrestrial food chain

A marine food chain

FOOD WEB

IT IS A NETWORK OF FOOD CHAIN WHICH BECOME INTERCONNECTED WITH VARIOUS TROPHIC LEVEL SO AS TO FORM THE NUMBER OF FEEDING CONNECTION AMONGST DIFFERENT ORG OF A BIOTIC FACTOR

CHARACTERISTICS

---IN ECOSYSTEM NO FOOD CHAIN IS
INDEPENDENT

---INTERLINKING OF A NO. OF A FOOD
CHAIN

---IT ALSO HELPS IN CHECKING THE OVER
POPULATION

---THREE TYPE=

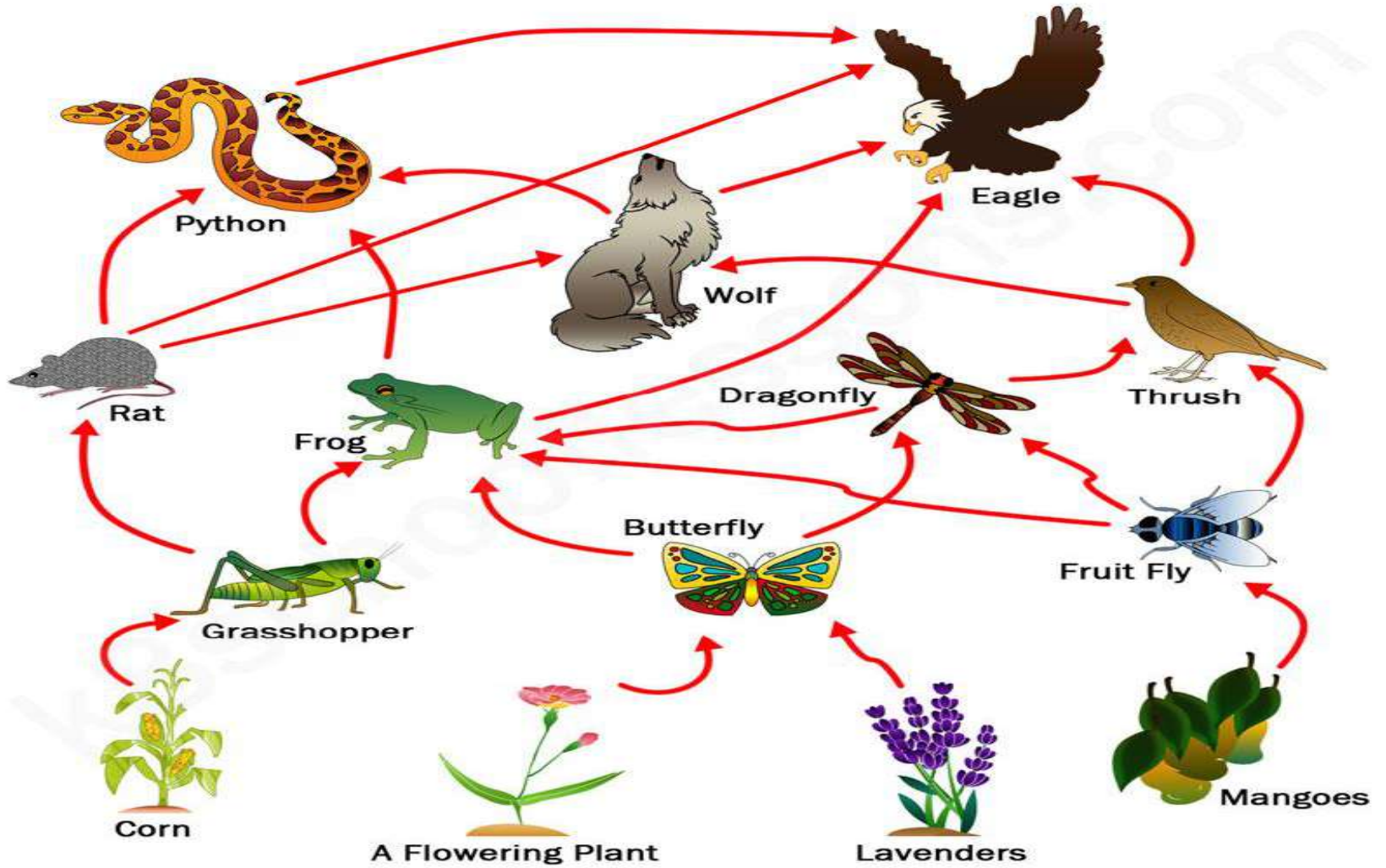
PREDATORY CHAIN

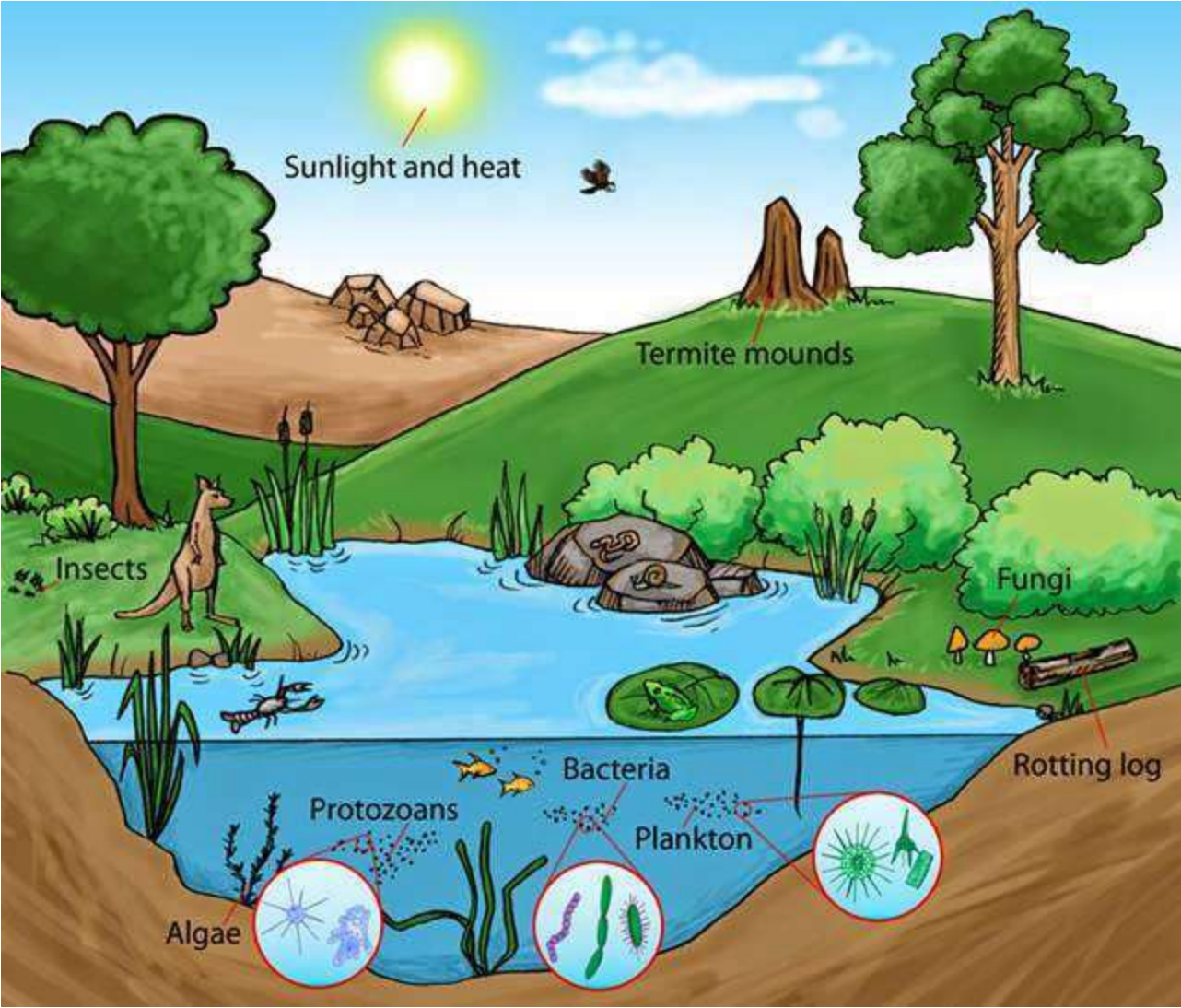
PARASITIC CHAIN

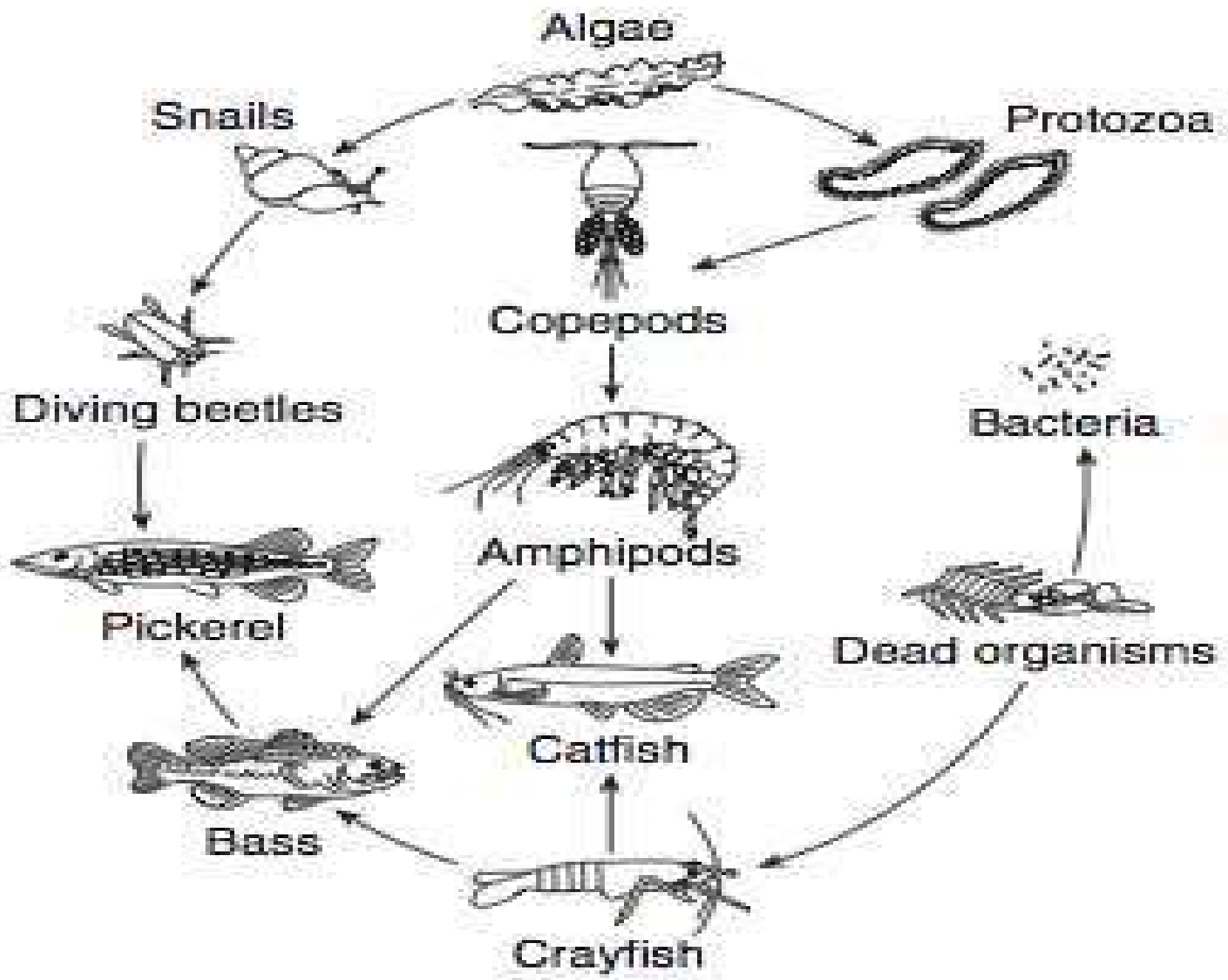
SAPROPHYTIC CHAIN

- AGE AND SIZE OF SPECIES OR AVAILABILITY OF FOOD RESOURCES DETERMINE THE POSITION OF ANIMAL IN A FOOD WEB.
- FOOD WEB OPERATE ACCORDING TO TASTE AND FOOD REFERANCE.
- COMPLEXITY OF ANY FOOD WEB DEPEND UPON BY BIODIVERSITY.

A Food Web







SIGNIFICANCE

**#IT GET STABILISE THE
ECOSYTEM**

**#FOOD WEB IN A ECO
SYSTEM GET DEVELOPED**

THANK YOU





***INSECT PESTS OF
SUGARCANE***

IMPORTANT PESTS OF Saccharum officinarum

- Sugarcane leafhopper (*Pyrilla perpusilla*)
- Sugarcane whitefly (*Aleurolobus barodensis*)
- Sugarcane top borer (*Scirpophaga nivella*)
- Sugarcane root borer (*Emmalocera depressela*)
- Gurdaspur borer (*Bissetia steniellus*)

Sugarcane leafhopper **(Pyrilla perpusilla-walker)**

- ❑ Systematic position
- ❑ Distribution
- ❑ General Appearance
- ❑ Food plants
- ❑ Habits
- ❑ Lifecycle
- ❑ Damage & Control

1. Systematic position

- **Class – Insecta** {Chitinous exoskeleton, three body parts ... head thorax abdomen, 1 pair of antennae, 3 pairs of jointed legs.}
- **Order – Hemiptera** {(true bugs, feed on plant(suck plant sap))}
- **Family – Fulgoridae** {insects having attractive colours}

2. Distribution

- ❖ Through out INDIA
- ❖ Great loss in U.P. , M.P. & Maharashtra
- ❖ Commonly called **Al** or **Ghora**

3. General appearance

- Straw colour leafhopper
- Two pairs of wings folded roof shaped on dorsal side
- 8-10mm long
- Anteriorly elongated head
- Prominent red eyes
- Whitish brown anal process covered with white wax



ADULTS



NYMPHS

4. Food plants

- ❑ Major pest of **sugarcane**
- ❑ Also attack **Wheat , Maize , Oat , Bajra , Barley , Sorghum** etc.

5. Habits

- Adults & Nymphs live on leaves
- Eggs ---
 - lower surface of leaves --- In summer
 - inside the leaf sheath --- in winter

6. Life Cycle

- Breed through out the year

★ Eggs :

- ❖ **Female lay eggs in cluster**
- ❖ **oval , shining , pale white or green in colour**
- ❖ **eggs are covered with white filamentous material**

★ Nymphs :



- ❖ Eggs hatch into nymphs in 7-22 days
- ❖ Freshly hatched nymphs are ----- cream coloured turn into **pale brown** coloured
- ❖ Suck cell sap of leaves

★ Adults : Nymphs change into adults.....

- In summer : 6-8 weeks , it will change...
- In winter : about 4 months
- 8-10 mm long
- Straw colour
- Life span :::: male ----- 5-7 weeks
female--- 5-8 weeks

→ Life cycle is of 40-60 days.

→ Total 4 generations are recorded in a year.

Eggs 300-536
in clusters



Hatch 8-10 Days in
summer, 3-4 weeks
in winter

Nymphs 5 Stages 8
weeks Summer, 5-6
Months Winter



Breeds
Throughout,
Active Mar-Oct

Adult 27-52
Days Summer,
18-20 Weeks
Winter



7. Damage

□ Nymph & adult suck cell sap & leaves dry up & turn pale

□ These secrete **honeydew** which attract harmful fungi

→ form a black layer & photosynthesis retardation occur

→ 35% loss of yield

8. Control

It can be controlled by :

- ❑ Collection of egg masses & destroying by burning , burying, spraying phenyl water.**
- ❑ Ratoon crops should be avoided.**
- ❑ Resistant varieties should be shown .**

- ❑ Infected crop should be dusted with 5-10% BHC dust.**
- ❑ Spraying of 0.25% endosulfan , 0.025% fermitrothion are also effective.**
- ❑ Spraying of 0.01% endrin at the rate of 500 liters per acre can control Pyrilla**

**SUGARCANE
PESTS**

**SUGARCANE
LEAFHOPPER**

**SUGARCANE
WHITEFLY**

**SUGARCANE TOP
BORER,
SUGARCANE
ROOT BORER,
GURDASPUR
BORER**

Order

Hemiptera

Hemiptera

Lepidoptera

Family

Fulgoridae

Aleurodidae

Pyralididae

Pests

Distribution

Food plants

Sugarcane whitefly

All over INDIA ,
specially in U.P., M.P.
,West Bengal , Orissa ,
Bihar

Sugarcane.....
Wheat , Barley , other
grass plant.

Sugarcane top borer

U.P ,M.P. ,
Pakistan , China ,Taiwan ,
Thailand , Sri Lanka,
Burma.

Sugarcane.....
Sarkanda

Sugarcane root borer

U.P. , M.P. ,Bihar

Sugarcane.....
Maize , Sarkanda

Gurdaspur borer

Haryana , Punjab ,
Rajasthan , Western U.P.

Sugarcane

GENERAL APPEARANCE & Damage

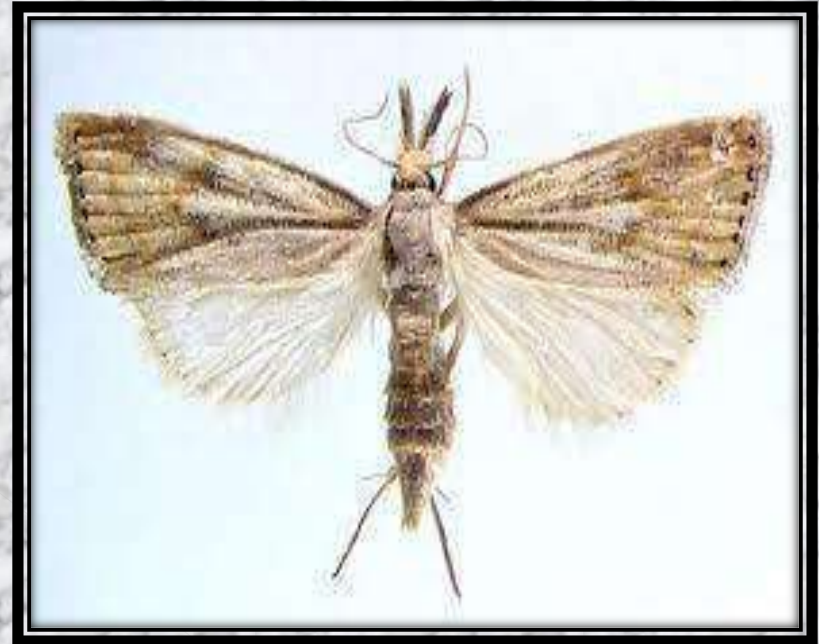
Sugarcane whitefly

- **33 mm long with expended wings.**
- **Pale yellow.**
- **Prominent black eyes.**
- **Active & fragile insects.**
- Nymphs cause main damage & plant became pale yellow.
- Sucrose content is decreased.



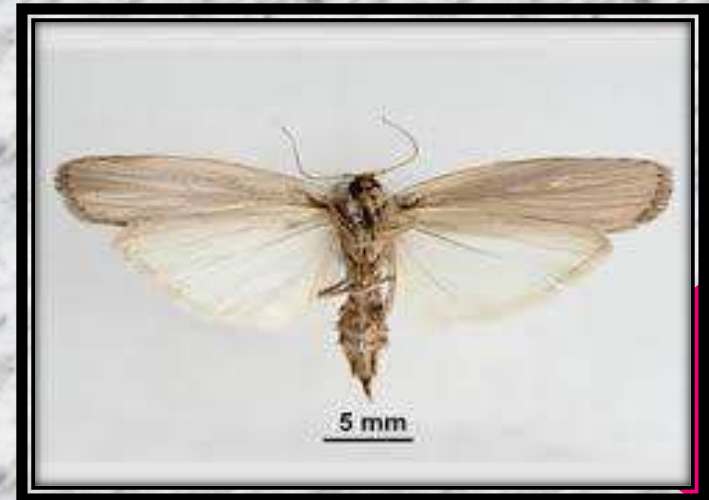
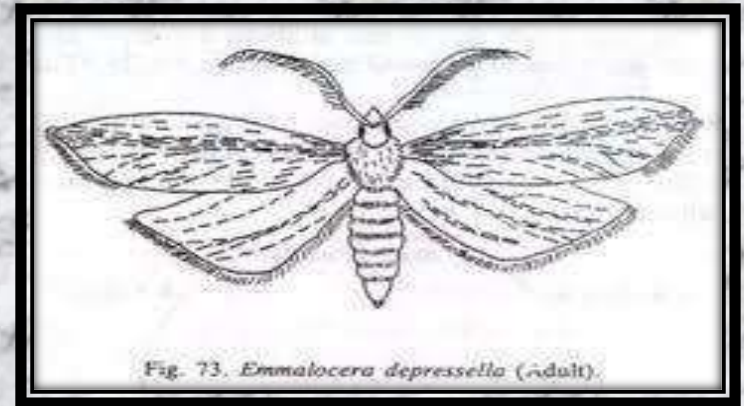
Sugarcane top borer

- **Silver white moth.**
- **Expanded wings.**
- **Dark black eyes.**
- **Males are smaller than females.**
- **More active in night.**
- **Main damage is caused by caterpillars, feed upon growing buds.**
- **These bore up to 4-5 nodes of top shoot.**
- **Loss of yield & quality of sugar.**



Sugarcane root borer

- 15-20 mm in length.
- Pale brownish in colour.
- Hind wings are white, shorter & broader than forewings.
- Longitudinal strips are on wings.
- Caterpillars feed on stem below soil, main attack is on young stem & form semicircular tunnels
- 10% reduction in yield.



Gurdaspur borer

- **25-45mm in length**
- **Greyish brown colour**
- **Adult is nocturnal**
- **Lives for 4-5 days**
- **Caterpillar bores into young shoots**
- **Form tunnel in stem & destroy it completely**
- **Feed on top part of stem**
- **Cause heavy loss (60%)**



Sugarcane whitefly

EGGS → NYMPHS → PUPA → ADULT

**SUGARCANE TOP BORER/ROOT
BORER/GURDASPUR BORER**

EGGS → CATERPILLAR → PUPA → ADULT

PESTS	Sugarcane whitefly	Sugarcane top borer	Sugarcane root borer	Gurdaspur borer
CONTROL	<ul style="list-style-type: none"> ○ <i>Ratooning should be avoided.</i> ○ <i>Resistant varieties of sugarcane should be avoided.</i> ○ <i>Infested leaves should be plucked & destroyed.</i> ○ <i>Harvesting should be completed before next plantation in adjacent fields.</i> ○ <i>0.2% BHC or 0.1% Malathion or 0.12% endrin should be sprayed.</i> ○ <i>Foliodol in ratio of 3ml/1 gallon of water should be sprayed.</i> 	<ul style="list-style-type: none"> ○ <i>Ratoon crops should be avoided.</i> ○ <i>Eggs of stem borer should be manually removed.</i> ○ <i>Resistant varieties should be grown.</i> ○ <i>The moths should be captured by light trap.</i> ○ <i>0.02% Endrin should be sprayed at the time of egg laying.</i> ○ <i>5% BHC should be dusted in the month of April & May.</i> 	<ul style="list-style-type: none"> ○ <i>Ratooning should be avoided.</i> ○ <i>Infected shoots should be removed & destroyed.</i> ○ <i>Moths should be picked by light traps.</i> ○ <i>BHC dust should be applied at the rate of 8kg per acre.</i> ○ <i>To kill eggs , aldrin at the rate of 10 kg per acre should be mixed with soil.</i> 	<ul style="list-style-type: none"> ○ <i>Ratoon crops should be avoided.</i> ○ <i>Affected sugarcanes should be removed.</i> ○ <i>Remove & destroy all stumps from vacated fields.</i> ○ <i>0.1% Endrin injection in affected stem can kill caterpillar.</i>

**THANK
YOU**