

# Chapter 11

## Trends and Issues in ICT





- **1. What is ICT ?**
  - **ANS:** Information and Communication Technology
  - **2. What is Mobile Computing?**
  - Mobile computing is a **technology that has computing capacity and can transmit/receive data while in move.**
  - It requires portable computing devices like laptops, tablets, smart phones etc, wireless communication networks and connectivity to the internet.
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# Explain the generations in Mobile Communication?



- There are five generations of Mobile communication.
  - They are:
    - 1) First Generation Networks**
    - 2) Second Generation Networks**
    - 3) Third Generation Networks**
    - 4) Fourth Generation Networks**
    - 5) Fifth Generation Networks**
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# 1) First Generation Networks



- Developed around 1980.
- 1G mobile phones were based on the **analog** system and provided basic **voice** facility only.



## 2) Second Generation Networks



- Use digital communication. Good quality audio, greater phone coverage. Data and MMS
  - **1. GSM(Global System for Mobiles):**
  - Frequency: 900MHz to 1800MHz.
  - SIM (Subscriber Identity Module).
  - **GPRS** (General Packet Radio Services): It is packet oriented data service. It has improved, voice quality short access time and higher data rate.
  - **EDGE** (Enhanced Data rates for GSM Evolution) : It is a digital technology. It's data rate is 3 times faster than GPRS.
  - **2.CDMA(Code Division Multiple Access):-**Using CDMA several transmitters can send information simultaneously over a single communication channel. It provides better coverage, better voice quality, high security than GSM.
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### 3) Third Generation Networks



- 3G wireless network offers high data rate than 2G. 3G is also called wireless broadband.
- It can send voice, data, multimedia information using portable devices like mobile phones.
- 3G use **WCDMA** (wide Band Code Division Multiple Access) technology).



## 4) Fourth Generation Networks



- 4G network is also called **L.T.E** (**Long Term Evolution**).
- 4G network provides high speed and good quality images and videos.
- 4G use **OFDMA**(**Orthogonal Frequency Division Multiplexing**).



## 5) Fifth Generation Networks



- It will offer faster, more number of connections, more energy-efficient and cost- effective data communication than its predecessors.



# What are the different mobile communication services?



- The different mobile communication services are:

- 1) Short Message Service (SMS)**
- 2) Multimedia Message Service (MMS)**
- 3) Global Positioning System (GPS)**
- 4) Smart Cards**



# 1) Short Message Service (SMS)



- It is a text messaging service used in mobile devices to exchange short messages. GSM system allows to send **160 characters**.
- When a message is sent it reaches a **SMSC**(Short Message Service Center) which stores and forward messages to recipients.



## 2) Multimedia Message Service (MMS)



- MMS allows user to exchange multimedia contents over mobile devices.
- An MMS server is responsible for storing and handling the incoming and outgoing MMS.



### 3) Global Positioning System (GPS)



- GPS is a **satellite based navigation system** that is used to locate a geographical position anywhere on earth using longitude and latitude.
- It is designed by **US Dept Of Defence** .
- It consists of satellites, control and monitoring stations and receivers.
- It also used in vehicles, airplanes, farming etc..



## 4) Smart Cards



- A smart card is a plastic card embedded with a computer chip/memory to stores and transacts data.
- The advantage of using smart card is that it is secure, intelligent and convenient.
- eg. RSBY card, mobile phones SIM, credit cards, ATM cards etc.

# What is Mobile Operating System?



- It is the **operating system** used in a **mobile device** (smart phone, tablet, etc.),
- It manages the hardware, multimedia functions, Internet connectivity, etc. in a mobile device.
- Popular mobile operating systems are **Android** from Google, **iOS** from Apple, BlackBerry OS from BlackBerry and **Windows** Phone from Microsoft.





# What is Android OS?



- It was developed by Android Inc. by **Andy Rubin**.
- Now it is a subsidiary of **Google**.
- The user interface of Android is based on **touch inputs** like **dragging, swapping, tapping, pinching** etc.
- Android uses **Linux kernel** as it has a powerful memory management and process management system.
- An Application Development Kit is available for the developers to develop applications called 'apps'.
- Apps are developed using **Java programming language**.

# What is big data analytics ?



- **Big Data Analytics:** It is the process of examining large data set containing a variety of data type to uncover hidden patterns, market trends, customer preferences and other useful information. Data may be collected from social media etc.



# What is Business Logistics?



- Business Logistics is the management of the flow of goods/resources (items like food, products, animals etc) in a business between the point of origin and to the point of consumption.
  - The objectives of business logistics is to ensure the availability of the right product, in the right quantity ant the right place and time for right customer at right cost.
  - Business logistics include,
    - 1)Purchase of material from a supplier**
    - 2)Transportation of those materials to the company's production facilities**
    - 3)Movement of finished goods through warehouse and transportation channels to customers.**
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# What is RFID?



- RFID(**radio Frequency Identification**) technology can be used to **identify, track or detect a wide variety of objects in logistics.**
- RFID Hardware consists of **tag and reader**. The tag contain a microchip for storing data and an antenna for sending and receiving data. These tags can be inserted or pasted on product containers or products.



- **Q) What is Intellectual Property?**
  - Many people are engaged in creative work like music, literary work, artistic work, discoveries, inventions, designs and software development. The outcome of such work is called **intellectual property**.
  - **Q) What is Intellectual Property Rights?**
  - **Intellectual Property Rights (IPR)** are similar to any other property right like right over land, house, etc. **IPR refers to the exclusive right given to a person over the creation of his/her mind, for a period of time.**
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- Intellectual property is divided into two categories:

**1) Industrial property**

**2) Copyright**

**1. Industrial property:** Industrial Property Right applies to industry, commerce and agricultural products. It protects **Patents** to inventions, **trademarks, industrial designs and geographical indications.**

**2. Copyright:** It is a legal right given to the creators for their **intellectual works.** Copyright applies to **books, music, painting, sculpture, films, advertisement and computer software.**

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# Industrial Property



- a). **Patents**: It is the **exclusive rights granted for an invention**. With Patent Protection, the invention cannot be commercially made, used or sold without the patent owners consent. The term for every patent in India is **20 yrs**. After this period the invention can be used by public freely.
  - b) **Trademark**: It is a **distinctive sign** (logo, symbol, name etc )to identify certain goods or products or services provided by an individual or a company. A trademark must be registered and is **limited to that country**. The initial term for registration is 10 years there after it can be renewed.
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- c). **Industrial Design**: An industrial design refers to the **ornamental or aesthetic aspects of an article**. A design may consists of 3D features like shape, surface or 2D features like patterns, lines or colour.
- d). **Geographical Indications**: Geographical indications are signs used on goods having a specific geographic origin and posses qualities due to that place of origin. Place of origin may be a village, town or a country. Eg. Palakkadan Matta Rice, Aranmula Kannadi

# What is Intellectual Property Infringement ?



- Unauthorized use of intellectual property right such as patents, trademark, copyrights etc are called Intellectual Property Infringement.
  - It may be a violation of civil or criminal law according to the law of the country.
- 1) **Patent Infringement** is caused by selling a patented invention without permission from the patent holder.
  - 2) **Trademark infringement** occurs when one party uses a trademark that is identical to a trademark owned by other party.
  - 3) **Copyright infringement** is the reproducing, displaying or broadcasting a work without permission from the copyright holder. It is also called **Piracy**. Eg: Software Piracy , video piracy etc

# What is Cyber space ?



- It is a virtual environment created by computers systems connected to internet. Internet is often referred to as cyber space.



# What is Cyber crime ?



- Cyber crime is defines as a criminal activity in which computers or computer networks are used as a tool, target or a place of criminal activity.
  - Cyber Crimes are basically divided into 3 categories,
    - 1)Cyber crimes against individuals**
    - 2)Cyber crime against property**
    - 3)Cyber crime against Government**
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# 1) Cyber Crime against Individuals :



- It is defined as an act in cyberspace against a person which cause physical or mental trouble to the person.
  - Cyber crime against individuals are classified into:
    - a). **Identity Theft:** Here a person uses another person's identifying information like their name, user id, credit card no etc without their permission to commit fraud activities. It is form of stealing personal identity to pretend someone is someone else.
    - b). **Harassment:** Posting indecent/vulgar comments focusing on gender, race, religion, nationality at specific individuals in chat rooms, social media, email etc is Harassment. The use of internet to harass someone is called cyber stalking. It can destroy friendships, careers, self image and confidence.
    - c) **Impersonation and Cheating:** Impersonation is the act of pretending to be another persons for the purpose of harming the victim. Eg. Sending fake e-mails seeking help for transferring huge amount of money from a distant.
    - d). **Violation of Privacy:** It is the intrusion into the personal life of another without a valid reason. It consists of distributing private information like personal data, photographs, workplace monitoring videos etc in social media sites.
    - e). **Dissemination of Obscene Material:** This may include displaying prohibited material on websites, use of computers for producing obscene materials, downloading obscene materials etc.
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## 2) Cyber Crimes against Property



- Cyber Crime against property includes all forms of property like credit cards, intellectual property etc.
  - These crimes include hacking, piracy, intrusion, possession of others information etc.
  - Some classifications of cyber crime are,
    - a). **Credit card fraud**: It involves unauthorized usage of another person's credit card information for the purpose of payments for purchases, or transferring funds etc.
    - b). **Intellectual Property Theft**: Intellectual property theft include violation of copyright, patent, trademark etc. Copying of another person's language, thoughts, ideas and presenting them as one's own original work is called Plagiarism.
    - c). **Internet Time Theft**: The usage of the internet time by persons without the permission of the owner is called internet time theft.
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### 3) Cyber Crime against Government:



- This include the cyber attacks against Govt. Sites/ computer networks in govt. organization.
- The different types of cyber attacks includes,
- a). **Cyber Terrorism:** It is a Cyber attack against sensitive computer networks like nuclear power plants, air traffic controls, gas line controls, telecom etc.
- b). **Website Defacement:** Defacement of websites include hacking of govt. websites and posting offensive comments about govt. in those websites.
- c). **Attacks Against e-governance Website:** This types of attacks include Denial of Service and DDoS (Distributed Denial of Service) attacks

# What is Cyber Ethics?



- While engage in Cyber Space we should ensure that our actions do not harm others. For this we should follow some ethics.
  - 1) Use anti-virus, firewall, and spam blocking software for your PC.
  - 2) Ensure security of websites (https and padlock) while conducting online cash transactions.
  - 3) Do not respond or act on e-mails sent from unknown sources.
  - 4) Use unique and complex passwords for accounts and change your passwords on a regular basis. (Should have a minimum of 8 characters, contain alphabets, numbers and special characters)
  - 5) Do not select the check boxes or click OK button before reading the contents of any agreement/message.
  - 6) Avoid the use of unauthorised software.
  - 7) Do not hide your identity and fool others.
  - 8) Do not use bad or rude language in social media and e-mails.
  - 9) Remove the check mark against 'Remember me' before logging into your account using computers other than your personal ones.

# What is Cyber law ?



- Cyber law refers is the **law governing the use of computers and internet.**
- **India's Information Technology Act 2000 ( Amended in 2008)** regulate the use of computer, servers, computer networks, data and information in electronic format.
- It give legal acceptance for electronic communication.
- Violations are treated as serious crimes and offenders are liable to penal actions.

# What is Cyber forensics ?



- Forensics is the process of using scientific knowledge for identifying, collecting, preserving, analysing and presenting evidence to the courts.

# What is Infomania ?



- It is the addiction of people to social media and internet based communication for acquiring knowledge.
- Now it is considered as a psychological problem which leads to loss of concentration, sleep etc..



# Previous Questions



- 1. Define the following terms:
  - a) Cyber forensics
  - b) Infomania
- 2. Briefly explain the application of RFID technology in the field of business logistics
- 3. Define the following terms
  - a) Trademark
  - b) Copyright

