

Chapter 11

Trends and Issues in ICT



Mobile computing

It is a technology that has computing capability and can transmit/receive data while in motion. Mobile computing requires portable computing devices like laptops, tablets, smart phones, etc., wireless communication networks and connectivity to Internet.

Generations of mobile communication

1G mobile phones were based on the analog system and provided basic voice facility only. 2G networks follow digital system for communication. Picture messages and MMS (Multimedia Messaging Service) were introduced in 2G. 3G networks offered multimedia services combining voice and data. It has the facility to send and receive large amounts of data using a mobile phone. 4G system, also called Long Term Evolution (L.T.E.), provides mobile ultra-broadband Internet access to mobile devices. 4G networks offer very high speeds and provide good quality images and videos.

Mobile communication technologies

Short Message Service (**SMS**) is a text messaging service in mobile communication systems that allows exchanging short text messages containing up to 160 characters.

Multimedia Messaging Service (**MMS**) is a standard way to send and receive messages that consists of multimedia content using mobile phones. MMS does not specify a maximum size for a multimedia message and it supports contents such as text, graphics, music, video clips and more.

Global Positioning System (**GPS**) is a satellite based navigation system that is used to locate a geographical position anywhere on earth, using its longitude and latitude. GPS is used for vehicle fleet tracking by transporting companies to track the movement of their trucks.

A **smart card** is a plastic card embedded with a computer chip / memory that stores and transacts data. The advantages of using smart cards is that it is secure (data is protected), intelligent (it can store and process data) and that it is convenient (it is easy to carry).

Mobile Operating System

The software that manages the hardware, multimedia functions, Internet connectivity, etc. in a mobile device. Eg: Android from Google, iOS from Apple, BlackBerry OS from BlackBerry and Windows Phone from Microsoft.

Android mobile OS

It is a Linux-based operating system designed mainly for touch screen mobile devices such as smart phones and tablet computers. It was originally developed by Android Inc. that was founded in Palo Alto, California in 2003 by Andy Rubin and his friends. In 2005, Google acquired Android Inc. making it a wholly owned subsidiary of Google.

ICT in Business

The use of ICT improves the quality of the product or service given to customers. Marketing and sales have undergone a strategic shift. Once shopping turned online, retailers could

track not only what customers bought, but also what else they looked for; how they navigated through the site; how much they were influenced by promotions, social media reviews, and page layouts; and similarities across individuals and groups. This is achieved with the help of ICT.



Social networks and big data analytics

Business firms are using the power of social media to gain a better understanding of their markets. The data that comes from posts to social media sites, digital pictures and videos, purchase transaction records, cell phone data, etc. which are related to a particular business can be considered as big data in business. Big data analytics is the process of examining large data sets containing a variety of data types to uncover hidden patterns, market trends, customer preferences and other useful business information.

Business logistics

Business logistics is the management of the flow of goods/resources in a business between the point of origin and the point of consumption in order to meet the requirements of customers or corporations. The objective of business logistics is ensuring the availability of the right product, in the right quantity and condition, at the right place and time for the right customer, at the right cost.

Radio Frequency Identification (RFID) technology can be used to identify, track, sort or detect a wide variety of objects in logistics.

Information security

- **Intellectual property rights (IPR)** refers to the exclusive right given to a person over the creation of his/her mind for a period of time. World Intellectual Property Organization (WIPO) is an agency dedicated to ensure IPR.
- **Industrial property right** applies to industry, commerce and agricultural products. It protects patents to inventions, trademarks, industrial designs and geographical indications.
- **Patent** is the exclusive rights granted for an invention.
- **Trademark** is a distinctive sign that identifies certain goods or services produced or provided by an individual or a company.
- **Industrial design** refers to the ornamental or aesthetic aspects of an article. A design may consist of three-dimensional features such as the shape, surface of an article or two-dimensional features, such as patterns, lines or colour.
- **Geographical indications** are signs used on goods that have a specific geographical origin and possess qualities or a reputation that are due to that place of origin. Eg: Aranmula Kannadi and Palakkadan Matta Rice.
- **Copyright** is a legal right given to the creators for an original work, usually for a limited period of time. Copyright applies to a wide range of creative, intellectual or artistic forms of works which include books, music, painting, sculpture, films, advertisement and computer software.
- **Intellectual Property Infringement** is the unauthorised use of intellectual property rights such as patents, copyrights and trademarks.

Cyber space

It is a virtual environment created by computer systems connected to the Internet. Cyberspace is an unreal world in which communication over computer networks occurs. It is an information superhighway where individuals gather information, interact, exchange ideas, provide social support, conduct business, play games, engage in discussions and so on.



Cyber Crime

It is defined as a criminal activity in which computers or computer networks are used as a tool, target or a place of criminal activity. The victims of cyber crime lose money, reputation and face mental trauma. Cyber crimes include phishing, hacking, denial of service attacks, etc. Computer crime mainly consists of unauthorised access to computer systems, credit card frauds, illegal downloading, child pornography, cyber terrorism, creation and/or distribution of viruses, spam and so on.

Cyber crimes against individuals:

- **Identity theft** occurs when someone uses another person's identifying information, like their name, credit card number, etc. without their permission to commit fraud or other crimes.
- **Harassment** means posting humiliating comments focusing on gender, race, religion, nationality at specific individuals in chat rooms, social media, e-mail, etc. is harassment.
- **Impersonation and cheating:** Impersonation is an act of pretending to be another person for the purpose of harming the victim.
- **Violation of privacy:** Violation of privacy is the intrusion into the personal life of another, without a valid reason.
- **Dissemination of obscene material:** The Internet has provided a medium for the facilitation of crimes like pornography. The distribution and posting of obscene material is one of the important cyber crimes today.

Cyber crimes against property:

- **Credit card fraud:** Credit card fraud involves an unauthorised usage of another person's credit card information for the purpose of payments for purchases or transferring funds from it.
- **Intellectual property theft:** The infringement of IPRs comes under this category. Violation of copyright, patent, trademark, etc. are intrusions against property.

Cyber crimes against government:

- **Cyber terrorism:** Cyber terrorism is a cyber attack against sensitive computer networks like nuclear power plants, air traffic controls, gas line controls, telecom, etc. Cyber terrorism focuses on the use of the Internet by anti nationals to affect a nation's economic and technological infrastructure.
- **Website defacement:** It includes hacking of government websites and posting derogatory comments about a government in those websites.
- **Attacks against e-governance websites:** These types of attacks deny a particular online government service. This is done using a Distributed Denial of Service (DDoS).

Cyber Ethics

- Use anti-virus, firewall, and spam blocking software for your PC.
- Ensure security of websites (https and padlock) while conducting online cash transactions.
- Do not respond or act on e-mails sent from unknown sources.
- Do not select the check boxes or click OK button before reading the contents of any agreement/message.
- Do not hide your identity and fool others.
- Do not use bad or rude language in social media and e-mails.

Cyber laws

The term cyber law in general refers to the legal and regulatory aspects of the Internet. Cyber law can be defined as a law governing the use of computers and Internet.

IT Act

The Information Technology Act, 2000 is India's legislation regulating the use of computer, servers, computer networks, data and information in electronic format. The legislation has touched various aspects related to authentication, digital signature, cyber crime and liability of network service provider.

Cyber Forensics

It is the discipline that combines elements of law and computer science to collect and analyse data from computer systems, networks, communication systems and storage devices in a way that is admissible as evidence in a court of law. The goal of computer forensics is to analyse data to support the collected evidence so as to use effectively in a legal case.

Infomania

It is the state of getting exhausted with excess information. It is the excessive enthusiasm to for acquiring knowledge. This may result in neglecting the more important things like duties, studies, family etc.

Questions from Previous Years' Question Papers (Computer Applications)

1. ____ is a Linux based mobile operating system from Google.
(a) ios (b) Blackberry (c) Android (d) Windows phone (1) (March 2016)
2. ____ is a packet oriented mobile data service on GSM. (1) (March 2016)
3. Raju sends a short message to his friend. Explain how the text message is exchanged.
(2) (March 2016)
4. What is Industrial Property Right? Write short note on any two Industrial Property Rights. (2) (March 2016)
5. In ____ system several transmitters can send information simultaneously over a single communication channel.
(a) CDMA (b) GPS (c) GSM (d) None of these (1) (SAY 2016)

6. GPS is very useful for tracking vehicles by transport company. How is it possible?

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(2) (SAY 2016)

7. SIM stands for _____.

(a) Subscriber Information Module

(b) Subscriber Identity Module

(c) Subscriber Identity Machine

(d) Subscriber Information Memory

(1) (SAY 2016)

8. What is Cyber Crime? Write a short note on any two cyber crimes against individuals.

(3) (SAY 2016)

9. A 4G mobile network uses _____.

(a) CDMA

(b) WCDMA

(c) OFDMA

(d) None of these

(1) (March 2017)

10. Write short note on Android operating system.

(2) (March 2017)

11. What is copyright? How does it differ from patent?

(3) (March 2017)

12. _____ is the popular mobile OS developed by Google based on Linux Kernel.

(a) Android

(b) iOS

(c) Blackberry

(d) go

(1) (SAY 2017)

13. Differentiate GPS and EDGE.

(2) (SAY 2017)

14. Write short note in IPR infringement.

(3) (SAY 2017)

15. Pick odd one out:

(a) Kitkat

(b) Jelly Bean

(c) Icecream Sandwich

(d) iOS

(1) (SAY 2017)