



COMPUTER SCIENCE – 11

Chapter 4

Application & Uses of Computer

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Impacts of Computer on Society

Q.1 Briefly discuss the impacts of computer technology on our society. OR
Briefly discuss the uses of computers in different fields of life.

Impacts of Computer on Society

- Impacts on our society
 - Activities of daily life performed easily & quickly
 - Time save & cost reduced
- **Business**
 - Administrative paperwork reduced
 - Businesses use websites (to sell products & contact customers)
- **Education**
 - In teaching and research
 - Information Collection
- **Banks**
 - Keeping records of customers & maintaining accounts
 - Facility of ATMs (money withdraw)
 - Online balance check & financial transaction

Impacts of Computer on Society

- **Entertainment**

- Watch television programs on Internet
- Watch movies, listen to music, and play games

- **Home**

- Maintain personal records
- Access information
- Home budgets making

- **Medical**

- Maintaining medical history of patients & other records
- Monitoring patients
- Diseases diagnosis

Uses of Computers in Business

Q.2 Explain how computers can be useful in business.

Uses of Computers in Business

- Global markets → impossible to run business without use of computer technology
- Administrative paperwork reduced
- Businesses use websites → to sell products & contact customers
- **Marketing**
 - Marketing applications available → provide information about products to customers
 - Maintaining records of products
- **Stock Exchanges**
 - Important places for businessmen (around the world → computerized)
 - Stockbrokers do trading → electronically
- **Banks**
 - Keeping records of customers & maintaining accounts
 - Cheques → read by MICR (Magnetic Ink Character Reader) input device
 - Facility of ATM → Money withdraw
 - Facility of credit cards → purchase through Internet

Uses of Computers in Business

- **Departmental Stores**

- Performance → quickly & accurately
- Example → record of products for sale maintained through computer
- Computerized bill generation
- Barcode on products → Barcode reader
- Record of sale → analyze sale of products & stock inventory
- Helps to manage stocks
- Security cameras → records activities of customers

Office Automation (OA)

- Process of automating office tasks with the help of computer technology
- Tasks
 - Decision-making
 - Data manipulation
 - Document handling
 - Communication & information storage
- Computer-based systems for office automation
- **Document Management System (DMS)**
- Consists of different applications → prepare and manage documents
- ***Word Processing***
 - Create & edit documents electronically
 - Produce high-quality letters, memos, proposals, reports, newsletters, and brochures, etc
- ***Desktop Publishing***
 - Make documents more attractive by use of photos, artwork, and other graphics.

Office Automation (OA)

- ***Spreadsheet Software***

- Manage & process data in rows and columns
- Perform financial calculations & recording transactions
- Provides facility to create various types of charts for displaying data graphically

- ***Reprographic***

- Process of reproducing multiple copies of a document

- ***Image Processing***

- Capture images, process them & store them
- Processing of images → render colors or contrast of an image
- Inserted into document

- **Message Handling System**

- Facsimile (Fax)
- Example → e-mails or voice mails are sent & received through Internet

- **Office Support System**

- Used to coordinate & manage activities of a workgroup
- Members of workgroup → share their work & coordinate with one another
- Examples → Groupware and desktop organizers

E-Commerce

- E-commerce → electronic commerce, ***e-trade*** or ***e-business***
- Financial business transaction conducted electronically between business partners over Internet
- Saves time for participants on both ends
- Users → buy, sell, and exchange products or services (via computer network)
 - Payments → credit cards.

Role of E-Commerce

• E-mail

- Electronically send & receive messages anywhere in world
- Spoken messages → through voice mail
- Important & common service → to keep in touch with customers about their orders

• Video Conferencing

- Meeting between two or more people located in different places
- Conducted through computer network → using video cameras & microphones
- Provides environment for a normal meeting
- Enables participants to see & hear each other at the same time (as if they are in the same room)
- Important in business meetings → face to face meeting
- Saves time & costs of travel
- Speed up business activities



E-Commerce

Role of E-Commerce

- **Electronic Shopping (E-Shopping)**

- Shopping conducted through the Internet
- Business organizations websites → sell goods & services
- Customers → place orders & make payments using credit cards
- People can purchase any goods → books, software, movies, and computers, etc

- **Electronic Banking**

- Service that allows account holder to obtain account information & manage certain banking transactions
- e-banking, online banking or cyber-banking
- Banks → introducing online banking
- Customers do not need to go to bank
- Connect to bank through network / Internet → see bank account status at home
- Conduct certain online transactions
- Pay utility bills through their bank accounts (or through credit card)

E-Commerce

Types of E-Commerce

- **Business-to-Consumer (B2C)**

- Direct trade between companies & end consumers
- Direct selling via Internet
- Example: customers and anyone buy products from supplier's website

- **Consumer-to-Consumer (C2C)**

- Direct trade between two consumers
- Helps online dealing with goods or services among different consumers
- Example: OLX

- **Business-to-Business (B2B)**

- Direct trade between two businesses/companies
- Companies do business with each other
- Example: manufacturers selling to distributors and wholesalers selling to retailers

Uses of Computer in Industry

Q.6 What are the uses of computers in the industry? Describe the role of robots in industry.

Uses of Computer in Industry

- Computers → control & monitor manufacturing system
 - continuous running of machinery
 - Help in monitoring temperature, pressure, for checking the quality, accuracy, and measurement
- **Role of Robots in Industry**
- Perform many complex tasks
- **Robot** → automatic programmable machine that can move and perform mechanical tasks
- Acts like a human being
- Work in environment that is dangerous for human beings → opening chemical packages
- Perform repetitive tasks continuously without any break, with high accuracy
- Applications of robots
 - Assembling & spray-painting of cars
 - Lifting of heavy equipment, power cables, etc.
 - Testing blood samples
 - Performing different activities in artificial satellites & radioactive environments etc

Computer-Aided Design (CAD)

- Enables engineers and architects to design models
 - products, new vehicles, aircraft, bridges, buildings, and many other things
 - Combination of hardware and software
- Allows engineers /architects to view a designed model from any angle
 - Designed model → changed/modified very easily
 - Engineer changes one value → all other values depend on it automatically changed accordingly
- Hardware devices required for designing products
 - high-quality graphics monitor
 - input devices → mouse, keyboard, light pen, and digitizing tablet for drawing
 - output devices → printers and plotters for printing designed models

Computer-Aided Manufacturing (CAM)

- System → control machine tools & related machinery in manufacturing process of product
- Combination of hardware and software
- Computers control all steps of product manufacturing
- Robots carry out processes in CAM environment
- Used in different industries
 - oil drilling, power generation, food production, and automobile manufacturing
- Example: in automobile plant → robots are used for assembling cars
 - † The product can be made very accurately and quickly
 - † Easily modified
 - † Requires small number of persons for labour
 - † Produced product is much cheaper

Computer Simulation

- Special type of computer model or program
- Represent the real-world system
- Simulation → artificial system, represents working of an actual system
- Often used to train people or students when:
 - Impossible to build a system due to economical problems
 - Direct experimentation is impossible in real life due to a dangerous system
 - System not available in real-time
- **Examples**
 - Flight simulation → for training of pilot
 - Pilot training to handle different situations that can arise during flight
 - Simulation of river system → to determine the potential effects of dams and irrigation networks before constructing the actual dam
 - In educational institutes → complicated and hazardous experiments performed by students using simulations
 - Network simulation → teach students how to create & configure network topologies

Uses of Computer in Medical Field

Q.10 Explain how a computer can be useful in the medical field.

Uses of Computer in Medical Field

- Medical Field → laboratories, research offices, scanning, monitoring, pharmacy, etc.
- Help doctors to diagnose diseases and many other purposes

Maintaining Patient History and other Records

- Patient Record → complete bio-data & medical history
- Update records easily, doctor's time saved
- other information also maintained → about doctors, medicines, and medical equipments
- Medical wards interconnected through a computer network

Patient Monitoring

- Continuous patient Monitoring → different electronic scanning devices (medical equipments)
 - Connected with computers
- Computers used in medical units
 - ICU (Intensive Care Unit)
 - Operation Theater.
 - Recovery Room.
 - Medical Ward.
 - ECG (Electrocardiograph)
- Medical equipment with sensors
 - Detects changes in heart rate, pulse rate, blood pressure, breathing, and brain activity
 - If any unbalancing situation occurs → computer activates alarming device, which creates sound and alerts the medical staff

Uses of Computer in Medical Field

- **Diagnosis**

- Medical tests → depend upon computing devices
 - E.g. laboratory tests of blood
- Body scan of patient
- Example: CAT (Computerized Axial Topography) scanner
 - passes rays over the patient
 - enables physicians to look through the patient's skin
 - displays an image of bone & tissue structure of patient on a computer screen.

Life Support Systems

- Help/support disabled persons
- Medical devices (life support systems) available
 - used by various kinds of disabled persons
- Scientists are also trying to make a medical device for blind person to see

Airline System & Weather Forecasting

Q.11 What is the use of computers in the airline system?

Q.12 How a computer can be useful for weather forecasting?

Airline System

- Computers used to control passenger aircraft and other vehicles
- Modern aircraft → controlled by sending signals to different parts (electronic devices)
- Pilot
 - controls all activities of aircraft through a computerized system
 - communicates with control room during flight
- Provide online access
- Passengers → connect their notebook or handheld computer to the web during their flights
- Facilities to customers
 - for reservation of seats online.
 - information about different flights etc.

Weather Forecasting

- Computer-based weather forecasting systems or models
- Weather forecasting depends upon accurate calculations on metrological data
- Data collection → from different weather stations & weather satellites etc.
- Collected data given to computer model → generates weather forecast
- Accuracy → from 70% to 90%
- Helps to make different decisions for performing different activities in daily life
- Some businesses depend upon the weather
 - Agricultural field.
 - Functions are arranged in daily life by seeing the weather forecast etc.
- In Pakistan → government department that provides information about weather
 - Pakistan Meteorological Department
 - Website: <http://www.pmd.gov.pk>
- SUPARCO also provides weather information

Uses of Computers in Education

Q.13 What is the use of computers in education? Discuss different methods used for teaching.

Uses of Computers in Education

- Education → process of developing knowledge through instructions
- Instructions received → from people (parents, teachers), and printed material (books, journals), etc.
- Problem solutions using computers → quickly and efficiently
- Information Collection
- Used in different colleges & universities to teach students in different ways
- Computer-based educational programs → to get an education or to learn a foreign language

Computer-Based Training (CBT)

- Any training that is delivered via a computer
- Computer-Assisted Instruction (CAI)
- Consists of different programs or other materials designed for educational purposes → available on CDs or Internet
 - Programs or materials → text, graphics, audio, and video (i.e. lectures recorded in the form of video)
 - + Students → easily learn new skills
 - + Training times reduced, Planning and timing problems reduced or eliminated
 - + Cost-effective method to train a large number of people or students
 - + Attractive method to deliver lectures
 - + Lectures can be repeated again and again

Uses of Computers in Education

Computer-Aided Learning (CAL)

- Use of information technology to assist in teaching and learning processes
- Reduce time that is spent on preparing teaching materials
- Reduce administrative load associated with teaching & research
- Teacher → prepares slides and delivers a lecture through computer
- Special device → multimedia projector

Online Education

- Process of getting education through a computer network
- Websites provide online education
- Some universities provide recorded lectures on their websites

Uses of Computers at Home

Q.14 How a computer can be useful at home?

Uses of Computers at Home

- Computers at home, like other electronic devices
 - i.e. T.V set, washing machine, oven, etc.
- Children play games on it, draw pictures (or cartoons), play music, watch movies, etc.
- PC at home → with small hard disk, printer, modem, and CD-ROM drive
- Used for keeping records, making budgets, send & receive e-mail messages on the Internet

Computer Assistance Simplifying Work Practices

Q.15 Describe how computer assists us in simplifying our work. Write some common reasons for using a computer.

Computer Assistance Simplifying Work Practices

- Computer → electronic machine
 - works according to the given instructions
- Cannot think and decide for itself
- Has no feeling
- Performs different operations according to program instructions
- Helps or assists us in simplifying our tasks
- **Reasons for using Computers**
 - Work much faster than human beings
 - Never get tired and do not need a rest
 - Do those jobs that may be dangerous for human beings to do
 - Store a large amount of information
 - Retrieve stored information very quickly
 - Never lose or misplace the stored information
 - Always give accurate results of calculations

Characteristics / Benefits of Computer

Q.16 Describe important characteristics/benefits of computers.

Characteristics / Benefits of Computer

Speed

- Computer → high-speed electronic device
- Processes data at a very high speed
- Execute millions or billions of instructions in one second (can process a large amount of data within a few seconds)
- Speed measured in Mega Hertz (MHz) or Gega Hertz (GHz) (Different computers have different speeds)

Accuracy/Precision

- Computers → does not make mistakes
- Processes data and gives accurate results
- Accuracy of result depends upon → correct input data & set of instructions
 - If any mistake in input data → no accurate results

Consistency

- Difficulty to repeat the same actions again and again in the same way & to get same result
 - Lecturer feels difficulty to repeat a lecture in a classroom again and again
- Computer → repeat the same actions consistently (again and again) without loosing its concentration.
 - To run a spell checker (built into a word processor) for checking spelling in a document
 - To play multimedia animation for training purposes
 - To deliver a lecture through a computer in a classroom etc.
- Computer → carry out activity, in the same way, every time

Characteristics / Benefits of Computer

Reliability

- Electronic components → very low failure rate
- Modern computer → perform complicated calculation without creating any problem (reliable)
- Personal computers → never needed a service call
- Communications networks → reliable and available whenever needed

Storage precision

- Computer memory
 - internal storage (memory)
 - external storage → secondary storage → store data permanently
- Stored data or information → available anytime
- Storage capacity → is increasing rapidly

Automation

- Data and instructions given to computer → automatically perform different operations
- Also control automatically different devices attached to computer
- Executes automatically the program instructions one by one

Video Conferencing

Q: 17 What is video conferencing? Discuss its benefits.

Video Conferencing

- Meeting between two or more people located in different places
- Conducted through a computer network
- Provides an environment of normal meeting
- Enables participants to see and hear each other at same time (as if in same room)
- Saves time, costs of travel, & speeds up business process
- Various training programs and educational classes conducted

Benefits of Video Conferencing

- † Easy way of conducting meeting between people located at different places
- † Provides an environment of normal meeting
- † Enables participants to see and hear each other at same time (as if in same room)
- † Saves time and costs of travel

For more details, refers to

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