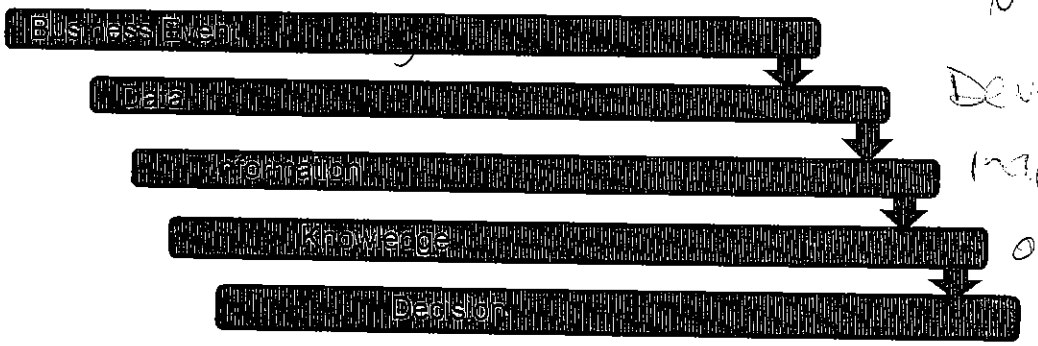
TOPIC 1 – STUDY UNIT 1

NATURE OF INFORMATION SYSTEMS

What is information?

- Start with Data
  - Data are the raw material for processing into information
- Information
  - Organised
  - Set of facts

Information is processed data that has meaning



Characteristics of information

- Accurate
- Accessible
- Up-to-Date
- Detail of information
- Flexibility
- Relevance
- Cost-effectiveness
- Reliability
- Timely
- Format

Users and users of information

Internal

- Management
- Financial manager
- Production Manager
- Staff manager
- Marketing manager
- Sales manager
- Purchase manager

- Employee

External

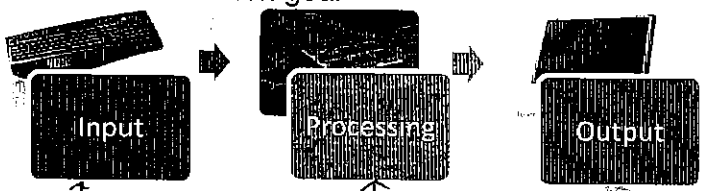
- Shareholders
- Suppliers
- Customers
- Government
- Financial Institutions
- Possible future employees

TOPIC 1 – STUDY UNIT 2

INFORMATION SYSTEM

What is a System?

- Two or more components
- Serves a common purpose
- Interactive
- Achieves a common goal



Open or Closed

- Closed System
  - Isolated from its environment
- Open system
  - Interacts with its environment
  - Affected by and affects its environment
- Look at how the system interacts e.g. purchasing

System Performance Measurement

- Monitoring of a working system
- Ensures it is effective
- Fulfils responsibility
- Makes the correct contribution
- Measurements
  - Effective (doing things right) measures outcomes against a predetermined level e.g. Budget vs Actual
  - Efficiency (doing right things) determines output over input
  - Performance standard is the specific set of performance standards

What is an information system?

- Organised way of:
  - Collecting
  - Processing
  - Managing
  - Reporting

  } Information for decision making

- System model
  - Input = gather/collecting
  - Processing = data conversion
  - Output = feedback/reporting

Role in the organisation

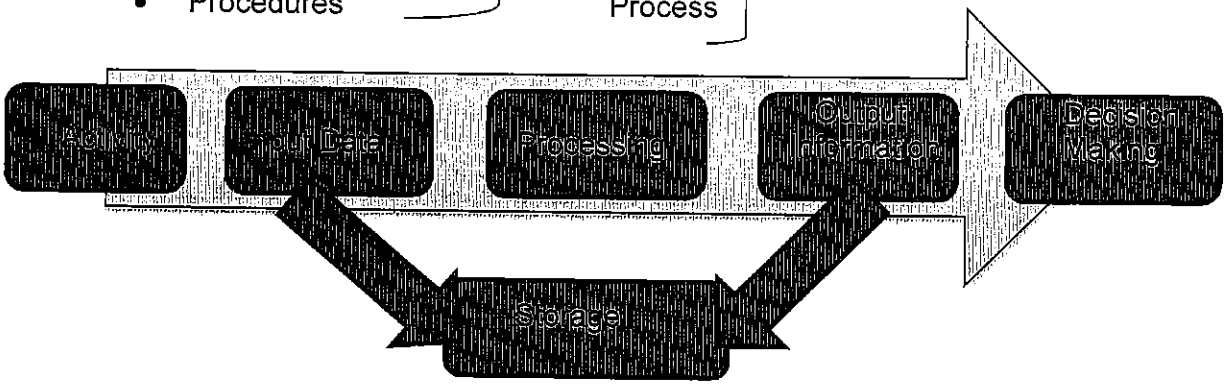
- Planning
- Recording transactions
- Decision making
- Control and performance measurement

Computerised information systems

- Set of collection of:
  - Hardware
  - Software
  - Telecommunication
  - People
  - Procedures

Used to
Collect
Store
Process

Data into information



Accounting information system

- Collects
- Records
- Stores
- Processes

Financial data for decision makers

TOPIC 1 – STUDY UNIT 3

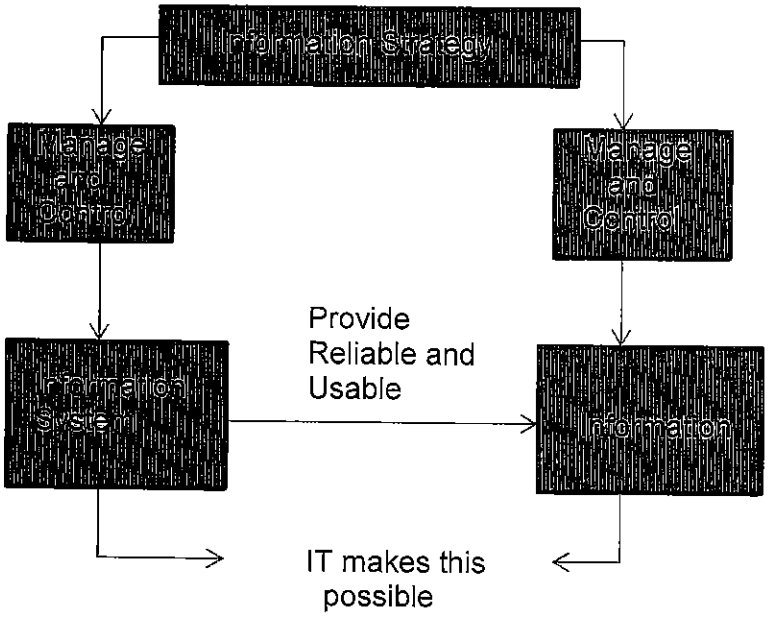
INFORMATION STRATEGY

What is an information strategy?

- Decisions or plan on how to use available information
- Collects information
- Uses the information technology

- Information technology is the processing of data using an electronic system and communication that links the software

Relationship between information, strategy and system



Information Strategy

- Should be in line with the organisation's strategy
  - Information Systems Strategy
  - Information Technology Strategy
  - Information Management Strategy

Benefits of IS strategy

- Contributes to organisational goals
- Ensures required information is acquired, retained and shared
- Minimises development and maintenance costs
- Competitive advantage
- Better quality of information

TOPIC 1 – STUDY UNIT 4

THE INFORMATION SYSTEMS DEPARTMENT

Function of the department

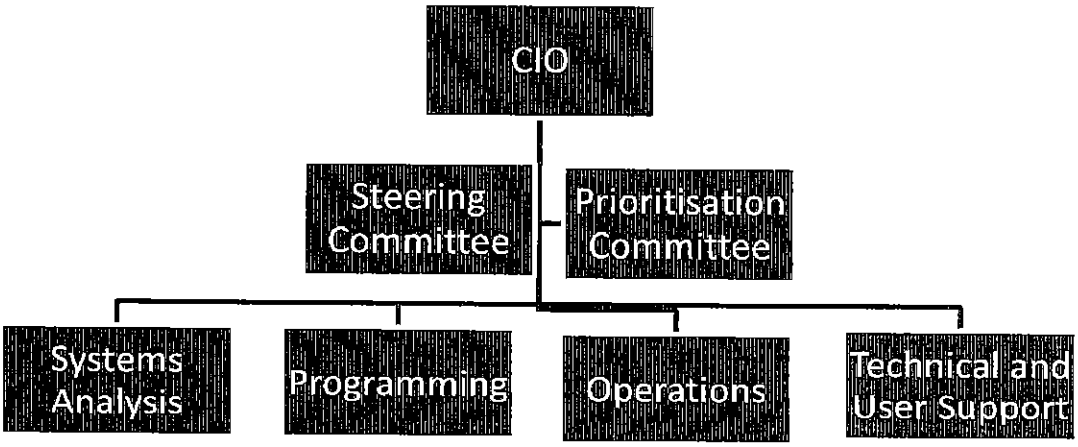
- Support function
- Aids in providing information that is:
  - Accurate
  - Functional
- Backbone
- Ensuring information system is operating efficiently
- Maintains and upgrades as required

Objectives of the IS Department

- Development of IS strategy
- Monitors the return on IS investment
- Setting of hardware and software standards
- New ways to meet users' needs
- Implementation of solution
- Minimising redundancy and increasing usability
- Technical assistance provided

Composition of IS department

- CIO.
- Steering committee
- Prioritisation committee
- System analysis
- Programming
- Operations
- Technical support
- User support



- Hire the correct staff, spend time interviewing and, when necessary, training
- Company will decide how to organise department – centralised or decentralised

Centralised

Advantages
- Reduction of duplication
- More secure
- Better control
- Economies of scale
- Optimal utilisation of capital

Disadvantages
- Single fault can affect entire organisation
- Regional offices less self sufficient
- Operational time wasted due to waiting for service

Decentralised

Advantages
- IS staff will be aware of IS and business needs at all levels in the regions
- Each office independent
- Quicker IS assistance
- Higher IS cost

Disadvantages
- Harder to control
- Lack of co-ordination due to independence
- Duplication of data

TOPIC 2 – UNIT 5

HARDWARE

Role of hardware? – incomplete

- Assists users to capture data
- Process flow

Input ⟶ Process ⟶ Output

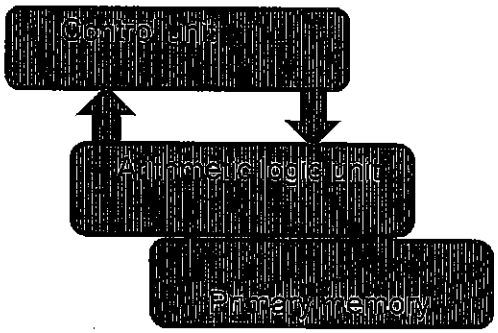
- Hardware components
  - Input devices
  - CPU
  - Primary memory
  - Secondary storage
  - Output

Input devices

- Keyboard
  - Use to input numbers, letters and special characters
  - Layout:
    - QWERTY
    - A-Z, numeric keypad, function keys, direction keys, modifier keys
  - Connected via, USB, port, Bluetooth and WiFi
- Mouse
  - Click and point.
- Imaging and video input devices
  - Scanner takes optical image and converts it to a usable digital format
- Touch sensitive screens
- Audio input devices

Processing - CPU

- Carries out the programs instructions
- Components of the CPU
  - Control unit
  - Arithmetic logic unit
  - Primary memory



How CPU functions

- CPU cycle
  - Read the programme instructions
  - Analyse the instructions - instruction phase
  - Execute calculations
  - Save the result - execution phase
- Variables stored in ALU.
- Calculation is performed.
- Result is moved to primary memory.

- Rands received = amount x exchange rate
  - Need to obtain an exchange rate
  - Need to obtain the amount of currency to be changed
  - Perform an arithmetic calculation

Processing – Types of primary memory

- Three main types:
  - Random access memory (RAM) - RAM (pronounced ramm) is an acronym for random access memory and is the most common type of memory found in computers and other devices, such as printers.
  - Read only memory (ROM) - Pronounced rohm, acronym for read-only memory, computer memory on which data has been pre-recorded. Once data has been written onto a ROM chip, it cannot be removed and can only be read.
- Programmable read only memory (PROM) - a memory chip on which data can be written only once. Once a program has been written onto a PROM, it remains there forever.
- Erasable programmable read only memory (EPROM) - pronounced ee-prom, EPROM is a special type of memory that retains its contents until it is exposed to ultraviolet light. The ultraviolet light clears its contents, making it possible to reprogram the memory.
- Electronically erasable read only memory (EEPROM) - Pronounced double-ee-prom or e-e-prom, EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge.
  - Cache - a special high-speed storage mechanism. It can be either a reserved section of main memory or an independent high-speed storage device.

Types of secondary storage media

- Also called permanent storage or storage devices
- Store large amounts of data, instructions and information permanently
- Types of media
  - Magnetic storage – e.g. Hard Drive
  - Optical storage – e.g. Optical disc
  - Flash Memory
  - Other

- Tertiary storage media (rarely used) – e.g. tape libraries

Output devices

- Monitor – another term for display screen. The term monitor, however, usually refers to the entire box, whereas display screen can mean just the screen.
- Printer – A device that prints text or illustrations on paper. There are many different types of printers.
  - Inkjet – A type of printer that works by spraying ionized ink at a sheet of paper. Magnetized plates in the ink's path direct the ink onto the paper in the desired shapes.
  - Laser – A type of printer that utilizes a laser beam to produce an image on a drum. The light of the laser alters the electrical charge on the drum wherever it hits.
    - Speed (ppm)
  - Multi-function printers – a single device that serves several functions, including printing. Typically, multifunction printers can act as a printer, a scanner, a fax machine and a photocopier.
  - Other types
- Dot matrix – A type of printer that produces characters and illustrations by striking pins against an ink ribbon to print closely spaced dots in the appropriate shape. Dot-matrix printers are relatively expensive and do not produce high-quality output.
- Plotter – A device that draws pictures on paper based on commands from a computer. Plotters differ from printers in that they draw lines using a pen. They are often wide format EG A1 or A0 paper
- Speakers – An electro-acoustic transducer that converts electrical signals into sounds loud enough to be heard at a distance. Synonymous with loudspeaker.

Other notable items

- Computer Case – A computer case is the enclosure that has the stuff of a computer
- Motherboard – A motherboard is the main printed circuit board (PCB) found in computers and other expandable systems. It holds many of the crucial electronic components of the system, such as the central processing unit (CPU) and memory, and provides connectors for other peripherals. Unlike a backplane, a motherboard contains significant sub-systems such as the processor and other components.
- Power supply – the component that supplies power to a computer. Most personal computers can be plugged into standard electrical outlets. The power supply converts alternating current (AC) to direct current (DC) that the internal components require.
- Video card – A board that plugs into a personal computer to give it display capabilities. The display capabilities of a computer, however, depend on both the logical circuitry (provided in the video adapter) and the display monitor.
- Sound card – An expansion board that enables a computer to manipulate and output sounds. Sound cards are necessary for nearly all CD-ROMs and have

become commonplace on modern personal computers. Sound cards enable the computer to output sound through speakers connected to the board, to record sound input from a microphone connected to the computer, and manipulate sound stored on a disk.

- Network card – Often abbreviated as NIC, an expansion board you insert into a computer so the computer can be connected to a network.

Types of computer systems

Size vs functionality

- Mobile
  - Laptops – A laptop is a portable personal computer with a clamshell form factor, suitable for mobile use. They are also sometimes called notebook computers or notebooks. Laptops are commonly used in a variety of settings, including work, education, and personal multimedia. They are frequently used as a primary PC platform amongst young people.A laptop combines the components and inputs as a desktop computer; including display, speakers keyboard, and pointing device (such as a touchpad), into a single device. Most modern-day laptop computers also have a webcam and a mic (microphone) pre-installed. A laptop can be powered either from a rechargeable battery, or by mains electricity via an AC adapter. Laptops are a diverse category of devices, and other more specific terms, such as ultrabooks or netbooks, refer to specialist types of laptop which have been optimised for certain uses. Hardware specifications change vastly between these classifications, forgoing greater and greater degrees of processing power to reduce heat emissions.
  - Netbooks – A small portable computing device, similar to a notebook. However, it has a smaller form factor and comes with more limited features.
  - Tablets PC – a type of notebook computer that has an LCD screen on which the user can write using a special-purpose pen, or stylus. The handwriting is digitized and can be converted to standard text through handwriting recognition, or it can remain as handwritten text. The stylus also can be used to type on a pen-based key layout where the lettered keys are arranged differently than a QWERTY keyboard.
  - Smartphones or PDA – Smartphones are a handheld device that integrates mobile phone capabilities with the more common features of a handheld computer or PDA. Smartphones allow users to store information, e-mail, install programs, along with using a mobile phone in one device. For example a Smartphone could be a mobile phone with some PDA functions integrated into the device, or vise versa.
- Desktop – A computer designed to fit comfortably on top of a desk, typically with the monitor sitting on top of the computer. Desktop model computers are broad and low, whereas tower model computers are narrow and tall. Because of their shape, desktop model computers are generally limited to three internal mass storage devices. Desktop models designed to be very small are sometimes referred to as slimline models. These computers tend to be inexpensive
- Workstations – A type of computer used for engineering applications (CAD/CAM), desktop publishing, software development, and other types of applications that require a moderate amount of computing power and

relatively high quality graphics capabilities. Workstations generally come with a large, high-resolution graphics screen, at least 64 MB (megabytes) of RAM, built-in network support, and a graphical user interface. Most workstations also have a mass storage device such as a disk drive, but a special type of workstation, called a diskless workstation, comes without a disk drive. In terms of computing power, workstations lie between personal computers and minicomputers, although the line is fuzzy on both ends.

- Servers – A computer or device on a network that manages network resources. There are many different types of servers. Servers are often dedicated, meaning that they perform no other tasks besides their server tasks. On multiprocessing operating systems, however, a single computer can execute several programs at once. A server in this case could refer to the program that is managing resources rather than the entire computer.
  - Types
    - Database - a computer system that processes database queries.
    - File - a computer and storage device dedicated to storing files. Any user on the network can store files on the server.
    - Transaction – a computer system that processes business transactions
    - Web - Web servers are computers that deliver (serves up) Web pages. Every Web server has an IP address and possibly a domain name.
- Mainframe – A very large and expensive computer capable of supporting hundreds, or even thousands, of users simultaneously
- Supercomputers – The fastest type of computer. Supercomputers are very expensive and are employed for specialized applications that require immense amounts of mathematical calculations. For example, weather forecasting requires a supercomputer.

<u>Hardware selection and upgrading</u>

- Processor speed
- Memory
- Storage output
- Connectivity devices