

Information Processing

Characteristics and Functions of Information Processing

Information Processing involves a machine or processor gathering, manipulating, storing, retrieving or classifying recorded information.

Example 1: An automatic electric kettle senses when water reaches its boiling point and switches off.

Example 2: A car production line can sense when a car is in a particular position to weld together certain parts.

Advantages of Information Processing

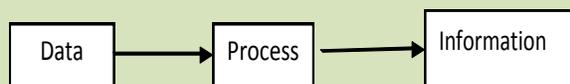
- Tasks can be completed fast because data and information can be processed quickly.
- Computers can process accurately large amounts of data.
- Computing storage devices can hold large volumes of data and information.

Disadvantages of Information Processing

- A high initial investment in equipment and training may be required.
- More money may be needed to employ specialized staff to operate and design the information processing system.
- Some jobs may be lost due to computerization of tasks.

NB.

Data is raw facts whereas information is data that is presented in a useful format.



Examples of Information Processing

E-learning: on-line classes which allow students to submit assignments electronically.

Health Care:

- Electronic Patient Records
- Monitor patient's vital signs
- Perform computer-based medical tests
- Research and diagnose a medical condition
- Operate implanted devices (e.g. pacemaker)
- Control surgical instruments during operations (e.g. laser eye surgery)

Banking:

Electronic Funds Transfer at the Point of Sale (EFTPOS) is useful for customers who shop using their debit or credit cards.

Payroll: A payroll system uses an information processing system to calculate the wages of each employee, print out pay-slips and record the information for accounting purposes.

Library: Members of a library are issued a card which carries a bar code. When a book is borrowed the barcode on the book and the borrower's card are read. This information is used to update the book and borrower files.

Industry: Creation of electronic circuit boards. The components are automatically placed in the correct position and then soldered onto the board. These operations are completed faster and are more accurate than if humans were used.

Weather Forecasting: Computers are used to forecast weather, track hurricanes, monitor global warming and ocean currents such as the El Nino effect.

Commercial Data Processing: Examples of such systems are:

- Stock ordering programs
- Sales processing systems
- Payment to suppliers systems
- Stock Control Systems.

Control Systems: Data is captured automatically. This is done through input devices called sensors. A sensor can measure things like temperature, sound, movement or pressure. It converts the measurement into an electronic signal which it sends to a processor. The software in the controller processes the data and determines what action to take.

Examples:

- Traffic Lights are triggered by the bumper of the vehicle interacting with the sensor embedded in the road.
- Microwave, cookers, washing machines and dryers all have control systems in them to allow them operation at the press of a button.
- Cars have management systems which tell the engine what to do e.g. control the flow of fuel to the engine and stop the car from going too fast.
- Buildings with air conditioners have sensors which detect the temperature and humidity inside the rooms and turn the heating on and off as needed.

Control System Types:

- **Automated Control Systems:** Once the system is started it follows a predefined program e.g. a washing machine.
- **Process Control Systems:** These check the state of the system before changes are made.

Other Examples of Sensor Systems

Analog Sensor	Measurement	Application
Temperature	How hot or cold?	Monitoring an oven temp
Light	How light or dark?	Turning on street lights
PH	The acidity of a liquid	Monitoring water pollution
Digital Sensor	Measurement	Application
Pressure Pad	If pad is pressed	Detecting cars at traffic lights
Button	If button is pressed	Obtaining ticket to car park
Light Gate	Detecting object passing through gate	Measuring object's speed
Passive Infrared	Detects a warm object	Burglar alarms

Documents used for Information Processing

Source Document: The original hard copy from which the data are entered. A source document is usually a form which is used to capture information before it is entered into the computer system.

Turnaround Document: A document produced by a computer that is later returned to a computer systems as machine readable input to be processed e.g. utility bills, multiple choice sheets.

Machine Readable Document: A document that can be subsequently used as input into the computer without any data preparation. For example, data stored on tapes, CDs, turnaround documents, bar codes on products and multiple choice sheets used with OMR..

Human Readable Document: Printed data that can be read by human beings. For example, output from a printer or monitor.