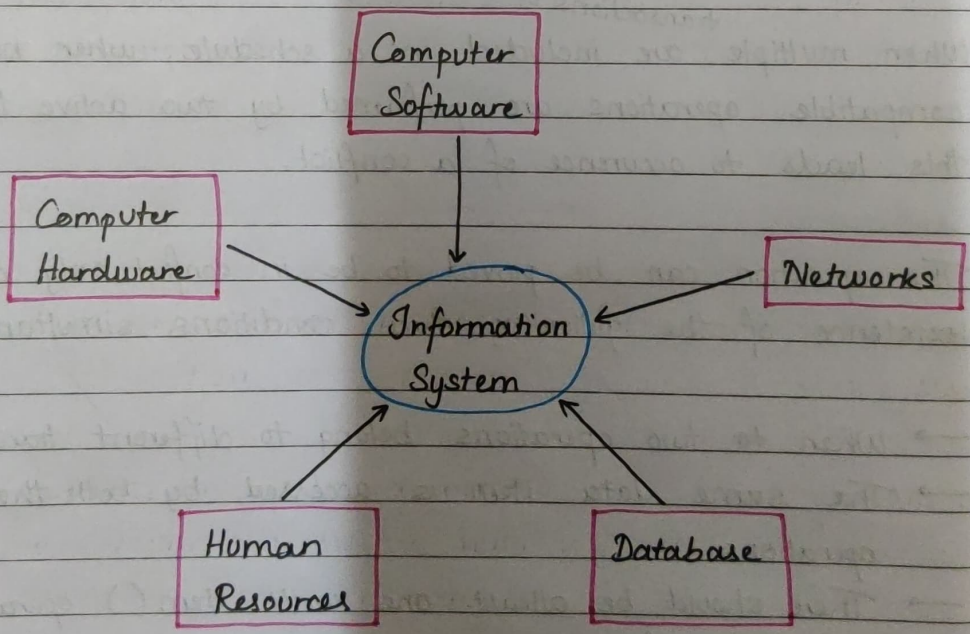
# Unit - 4

Q9. Information System Components / Architecture / Design

- An information system is a combination of hardware and software telecommunication networks.
- It is built to collect, create and distribute useful data, typically in an organization.
- It defines the flow of information within the system.
- The objective of an information system is to provide appropriate information to the user, to gather the data, process the data and communicate information to the user of the system.




- Components of Information systems are as follows →

1. Computer Hardware -

→ Physical equipment used for input, output and processing. The hardware type depends on the type

and size of the organisation.

→ It includes an input and output device, operating system, processor, and media devices. It also includes computer peripheral devices.

2. Computer Software :

→ The programs / applications used to control and coordinate the hardware components.

→ These programs include a set of instructions to analyse and process the data.

→ Software is further classified into → System software
Application software
Procedures.

3. Databases :

→ Data are the raw organized facts and figures that are later processed to generate information.

→ Data is managed using database management system. Database software is used for efficient access of required data, and to manage knowledge bases.

4. Network :

→ It refers to the telecommunication networks like the intranet, extranet and the internet.

→ It facilitates the flow of information in the organization.

→ It includes both physical devices like routers, hubs, cables etc. and software such as web servers, data servers etc.

5. Human Resources:

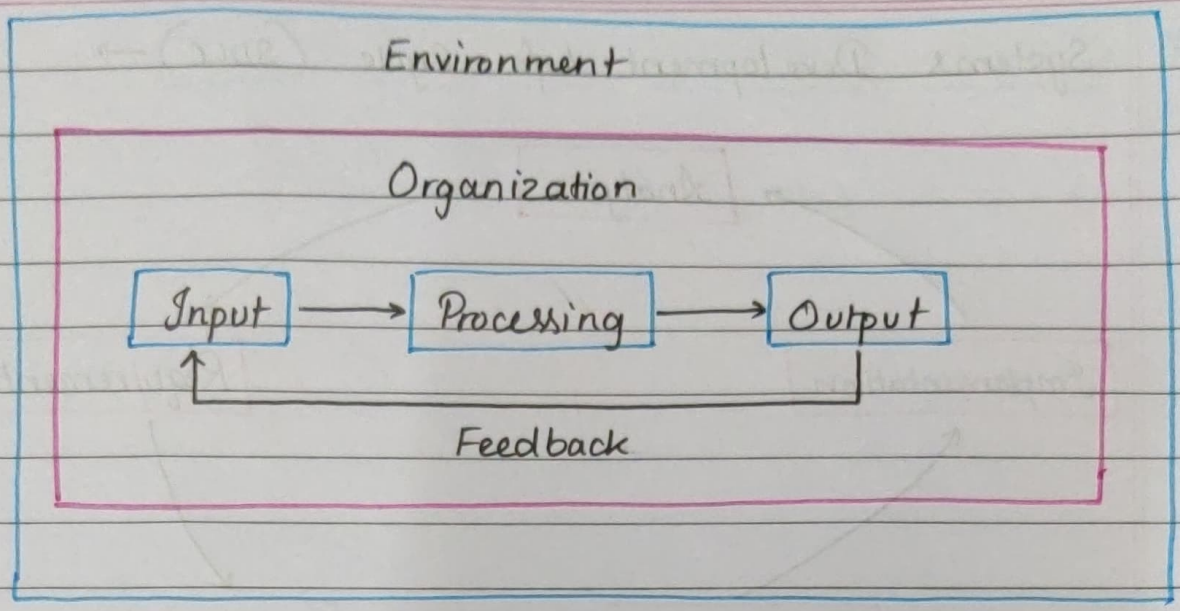
→ It is the manpower required to run and manage the system.

→ People are the end users of the information system, (accountants, customers, clerks, etc.)

→ People are also responsible for developing and operating information systems (computer operators, programmers etc.)

☆ Information System Design →

- When an Information System Professional talks about design they are referring to business processes
- Problems must be analyzed and requirements must be documented before solutions are designed, developed and implemented.
- Satisfying the business need is the baseline standard.



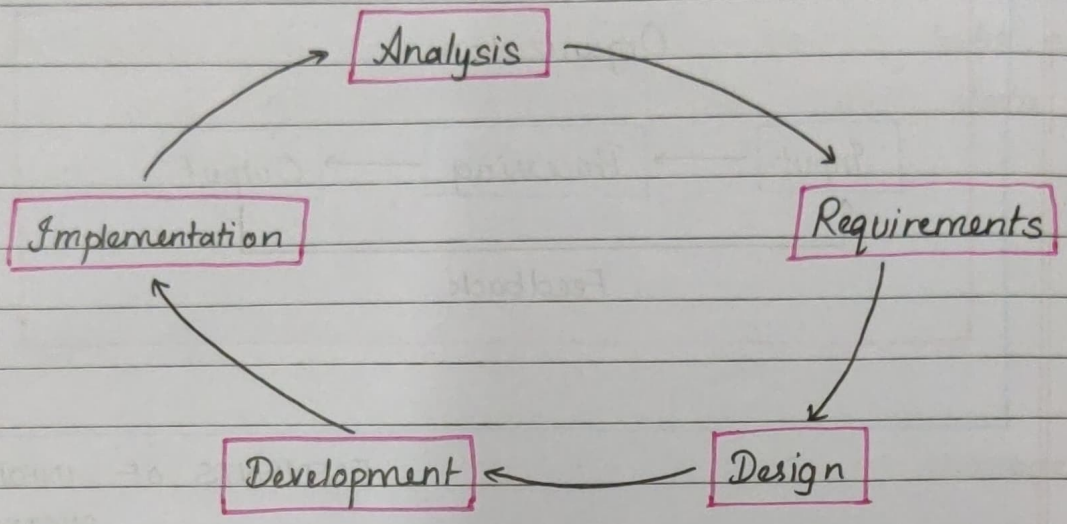

ELEMENTS OF INFORMATION SYSTEM

Usability describes how easy the system is to navigate. The easier it is, the lesser time the user will need to spend learning to use the system. A more usable system will leave lesser room for error, and following conventions tremendously increases the potential for acceptance.

Graphic design refers to the visual appeal of the user interface. Designs also need to fit with the overall brand of the client (colours, fonts, logos)

Analytical design describes how to best represent information, especially quantitative information which must be communicated clearly. Every information systems project has quantitative ~~info~~ dimensions associated (estimating costs, time schedules etc.)

## ☆ Systems Development Life Cycle (SDLC) →




SDLC Architecture

Information systems are designed using the systems development life cycle (SDLC)
The five phases are

1. Analysis
2. Requirements (vision of future state)
3. Design
4. Development
5. Implementation

Analysis involves analysing the current situation and problems.
Then specify the requirements that the solution should embody.
The next stage involves designing a solution (no programming yet)
The system is then developed (programming) and tested
Finally the system goes live for the end users as it is implemented in the business setting.

## Features of Information System Security:-

### Data:-

Data refers to raw facts and figures, representing information that is processed and utilized by the information system.

* Data is a foundation of information systems, and its effective management, storage, processing, are critical for decision-making.

### People:-

People are essential components of information systems, encloses with end-users, IT Professionals, and stake-holders

* People are interact with the system, input and retrieve data, make decisions, and utilize technology to achieve organizational goals.

### Software:-

Software includes applications, programs, and operating systems that enable information systems to perform specific tasks and functions.

Software Provides the functionality needed for data processing, analysis and the execution of various business processes within the system.

### Hardware:-

Hardware Comprises the Physical Components of the information system, such as servers, Computers, storage devices, devices and networking equipment.

→ Hardware facilitates the Processing, storage and Communication of data within the information system, Serving to the software applications.

Tele Communications:-

Tele Communications ensures connectivity and data transfer b/w different components of the information system.

~~Tele Communications ensures Connectivity and data transfer b/w different Components.~~

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Tele Communication involves the Communication infrastructure, including networks, internet Connections and Communication Protocols that enables data exchange

Functions of Information System:-

There are various functions of information systems like the Collection of input data, storage, Processing, and Producing the output information. The functions also Control the information flow as well as the feedback loop. The systems Can be also open and Closed systems.

Input:-

Input involves the capturing and Collection of raw data from various sources.

Input Can take various forms, including manual data entry, automated data Collections through sensors,

or data imports from external source.

Storage :-

Storage involves organizing and maintaining data for future use.

Data ~~storage~~ is stored in databases using technologies like relational Databases, cloud storage, etc...

Data is stored in databases or other structures, ensuring accessibility and retrieval when needed.

Processing :-

A Process is a function which transforms data into information. ~~A simple process would be adding up the no of items that is sold~~

Processing involves manipulating and transforming raw data into meaningful information

Data Processing involves a series of operations such as sorting, filtering, calculations, and transformations.

~~Feedback / Control Loops~~

Output :-

There are two types of output in this context, graphical and textual

=> Graphical output is usually used to look at information on a larger scale which is then Presented as charts, graphs, diagrams and Pictures.

=> Textual output is information on a smaller scale which is presented as charts, text or numbers.

## Open and closed systems :-

Open systems interact with their environment, exchanging information and resources.

Closed systems, on the other hand, operate independently with minimal interaction.

## Feedback / Control loops :-

Feedback / control loop is what happens to output when it is processed and produced.

3 Limitations of Information System:-

~~Implementing~~

→ Costs:-

Implementing and maintaining information systems can be expensive, involving costs for hardware, software, training and ongoing ~~mechanics~~ maintenance.

→ Complexity:-

Information systems can be complex, especially in large organizations with multiple systems and interconnected components.

→ Dependence:-

Organizations become heavily dependent on information systems and any disruptions to technology (hardware failures, software glitches) can have significant consequences on operations.

→ Resistance from employees:-

The introduction of information systems in an organization may face resistance from employees. This resistance can stem from various factors, such as a lack of understanding of system use, fear of job displacement impact on work processes.

→ Data quality and Integrity:-

Information systems depends on accurate and high-quality data.

Inaccurate, incomplete, or inconsistent data can lead to errors in decision-making and undermine the effectiveness of the system.

→ Integration challenges:-

Integrating new information systems with existing new ones can be challenging.

Legacy systems may not seamlessly interact with modern technologies, leading to compatibility issues.