Information Systems

An information system is an interconnected set of components used to collect, store, process, and transmit digital data and information. Essentially, it is a collection of hardware, software, data, people, and processes that work together to transform raw data into useful information.

Components of an Information System

Inputs: A set of components and units that comprise the system and upon which it relies fundamentally. System inputs are numerous and varied depending on the objectives the system seeks to achieve. They may be data, raw materials, capital, or human resources.

Processes (processing): The precise working mechanisms that govern the regular internal interactions of system components. These are all the programmed relationships and transformational activities that process inputs and transform them into outputs, such that their completion is linked to the achievement of specific organizational goals**.**

Outputs: System outputs may take the form of physical products, services, information, or other inputs. Outputs are considered the product of processes. In other words, system outputs are strongly linked to the purpose of the system.

Feedback: This is the feedback or impact of the external environment on the system, which assesses the suitability, suitability, and efficiency of the system in achieving the desired objectives and meeting the needs of the beneficiary. This feedback assesses any shortcomings or defects in the system's implementation so that they can be corrected and avoided in the future.

Types of Systems:

1- Closed Systems:

Systems that are not connected to the external environment. The external environment is dependent on the system, and its operation is limited to what is within it. This means that it

has no give-and-take relationship with the external environment. These systems exist for theoretical study purposes only.

2- Open Systems:

These are systems that interact with the external environment; there is a reciprocal, influential relationship between them and the external environment.

These systems are characterized by: a complete lack of control over their inputs due to the absence of input monitoring. Therefore, some inputs are known and others are unknown. These systems are constantly subject to disturbance and remain in a state of imbalance**.**

3- Semi-Enclosed Systems:

The inputs to these systems from the external environment are specific and known in advance due to the presence of a process of control and monitoring of the inputs. Their outputs are therefore known. Therefore, these systems are more stable and maintain a state of balance.

Examples include: a traffic system (bus departure times), controlled application systems, and a computer with an installed virus protection system.

The Importance of Information Systems

 Information is one of the most important components of our contemporary lives, as it is linked to all fields and human activities.

 Information plays a significant and effective role in enriching scientific research and advancing science and technology.

 Information is an essential element in making appropriate decisions and solving problems.

 It is of great importance in the areas of economic, social, administrative, cultural, and health development**.**

 It plays a major role in the information society, where energy and raw materials were the foundation of industrial and agricultural societies.

 It constitutes a link connecting people to each other, transferring expertise, and solving various problems**.**

Reasons for the Emergence of Information Systems

 Management in organizations needs an effective system that helps them accurately estimate future possibilities based on the raw data obtained to enable sound decision-making.

Facilitating the exchange of information between business departments. The more functional business departments there are, the greater the need to share information horizontally between departments at the same level, and vertically between departments at different levels**.**

 The need for a vast amount of accurate and useful information regarding large projects has increased. With technical and practical development, the size of projects has increased, and consequently, funding has increased. This means that any mistake in a decision, even a small one, can lead to the loss of significant sums of money. Furthermore, obtaining accurate data maintains the challenge and enables the organization to keep pace with all changes occurring in the market.

 Economic competition at the international and local levels.

Management Information Systems

Management Information Systems (MIS) are systems used to collect, store, process, and analyze data and information within an organization to support management decision-making. These systems involve the use of technology, software, and networks to collect data from various sources, analyze it, and present it in the form of reports and dashboards that help management make decisions.

Components of Management Information Systems

Management information systems consist of several main components that work together to provide accurate and reliable information to management. Here are some of the main components of management information systems:

1. Hardware: This includes the physical devices used to operate the management information system, such as servers, computers, and networks.

2. Software: This is a set of programs and applications used to operate devices and computers, analyze data, and manage information, such as databases and customer relationship management systems**.**

3. Databases: This includes the databases that store data and information used by management information systems.

There are several types of databases, including:

1-1Relational databases

Used to organize data into related tables, such as: MySQL, PostgreSQL, Oracle

2. Non-relational databases (NoSQL)

Used to organize data in non-relational forms, such as:

MongoDB

Cassandra

Redis

3. Network databases

Used to organize data into a network of relationships, such as: CODASYL

4. Hierarchical databases

Used to organize data in a hierarchical structure, such as: Information Management System (IMS)

5. Object-oriented databases (Object-Oriented databases)

Used to organize data into objects, such as: ObjectDB

6. Cloud databases

Used to organize data in the cloud, such as: Amazon Aurora and Google Cloud SQL

7. Distributed databases

Used to organize data across multiple locations, such as: Apache Cassandra 6

8. Temporal databases (Time-Series Databases)

Used to organize time-series data, such as:

InfluxDB – OpenTSDB

4. Networks: These include networks that connect devices and servers and allow the exchange of data and information**.**

Types of Networks

1. Computer Networks: These connect computers and other devices.

2. Telecommunication Networks: These connect devices and other networks.

3. Internet Networks: These connect different networks around the world.

5. Users: These include the people who use the information system, including:

1. Senior management uses MIS to make strategic decisions.

2. Managers use MIS to monitor performance and analyze data.

3. Employees use MIS to perform their daily tasks.