KAYODE PETER TEMITOPE 208077 COMPUTER SCIENCE (300 LEVEL)

CSC 302: SYSTEMS ANALYSIS ASSIGNMENT (2021/2022 SESSION)

Categories of Information System

1. Data-processing systems
2. Real-time systems
3. Decision support systems
4. Knowledge-based systems

Data-processing systems

Such a system generally has some large database of information and the purpose of the system is to provide quick, easy access and processing of data.

Depending on the degree to which data is processed and analyzed, systems may be classified as either transaction processing systems or management information systems. A system which basically manages the data necessary to perform the daily business is a transaction support system. A system which summarizes data in a form useful for the management of a business is a management information system.

Real-time systems

The environment outside the boundaries of the system is not under the system's control. Therefore a system will need to be able to respond to data whenever it arrives — real time systems must respond quickly to changes in the inputs from the environment. Typical response times would be of the order of a few milliseconds or even microseconds. To achieve such a fast response the system needs to prioritize its tasks, often dividing them into several processes that may interrupt each other. However, as soon as there are several tasks, they must be able to communicate properly with one another and not interfere with each other. Because of environmental interactions, real-time systems have to be robust to accidents, errors and failures in the external parts of the system. That is, they must respond in a safe and controlled manner in (almost) all conceivable circumstances.

Decision support systems

Although a data-processing system may help to identify a problem in the business, it does not suggest any solution to the problem. In a decision support system, given a problem, the system attempts to fit the data on the problem into some model and thereby suggest a solution to the problem. A decision support system may have different models, say operational research or statistical models. The manager chooses the model appropriate to the problem.

Ultimately, of course, any decision is made by the manager and not the system. The manager may know or guess something which cannot be represented in the system's models, and this may affect their decision. The system is simply there to clarify the problem and suggest solutions as far as it is able.

Knowledge-based systems

In some situations it is not a large amount of data that needs to be handled, but a large amount of knowledge. Knowledge is a combination of rules, laws, constraints and previous experience. A knowledge-based system encapsulates a knowledge-base, like a database but filled with knowledge, and enables the user, possibly unskilled in the problem area, to use the knowledge-base to solve problems.

In business systems, the knowledge-based system often takes the form of what is called an "expert system". Expert systems embody the knowledge of a particular class of experts, such as medical doctors, and the system (ideally) provides the same answers as an expert of that class would. In the case of a medical expert system, this could be a diagnosis of an illness, and perhaps a recommendation for a specific choice of treatment or for further tests.

Examples of Each Categories of Information System

Categories	Examples
Data Processing System	• Online Processing system • Multiprocessing system • Batch Processing system • Time-sharing system
Real Time System	• Air traffic control systems • Process control systems • Autonomous driving systems.
Decision Support System	• Data-driven system • Model-driven system • Knowledge-driven system • Document-driven system • Communication-driven system • Intelligent system • Manual system • Hybrid system
Knowledge Based System	• Case-based systems • Expert systems • Hypertext manipulation systems • Intelligent tutoring systems • Rule-based systems