Department of Commerce
University of Calcutta

Study Material

Cum

Lecture Notes

Paper: CC.302: Information Technology and Computer Applications (ISCA)

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INFORMATION SYSTEMS AND COMPUTER APPLICATIONS (ISCA)

PAPER - CC: 302

M.COM SEMESTER - III

Department of Commerce
UNIVERSITY OF CALCUTTA

Unit - I
Key Information Systems Concept

System

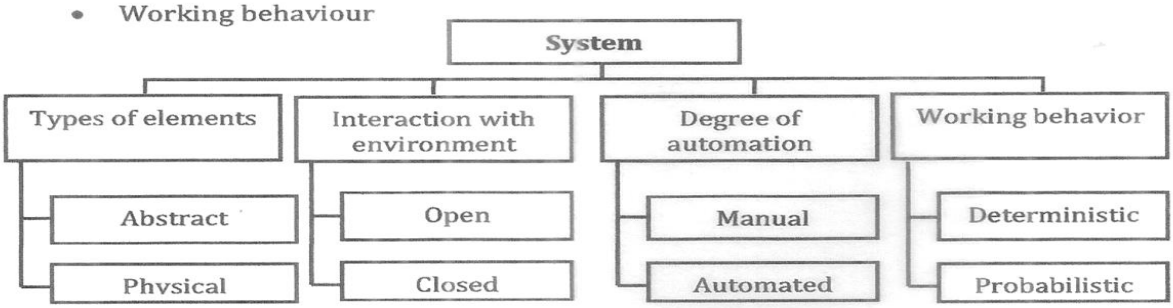
The term system is derived from the Greek word **'Systema'** which means an organized relationship among functioning units or components.

'A set of inter-related, inter-connected or inter-dependent elements that operates collectively to accomplish some common purpose or goal is called System".

Types of System

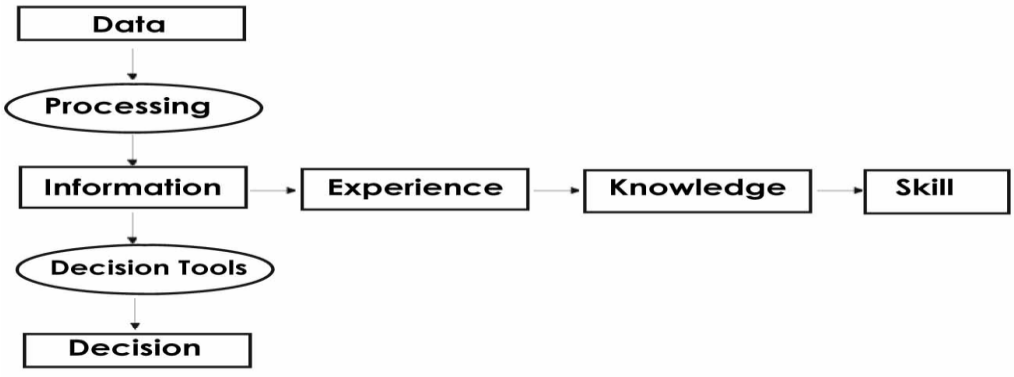
We can distinguish systems on the following basis –

- Types of element
- Interaction with environment
- Degree of automation
- Working behaviour



Information

'Information is data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in current and progressive decision.' - (Davis and Olson)



Information System

An Information system may be defined as a set of devices, procedures and operating system designed around user-base criteria to produce information and communicating it to the user for planning control and performance.

Information System and its Implications

An Information System can provide effective information for decision-making and control of some functionalities of an organization. Enterprises use information system to reduce costs, control wastes or generate revenue. Some of important implications of information system in business are as follows:

- Information system helps managers in effective decision-making to achieve the organizational goal.
- Innovative ideas for solving critical problems may come out from good Information System.
- Knowledge gathered through Information System may be utilized by managers in unusual situations.
- Based on the well designed information system, an organization will gain edge in the competitive environment.

Computer Based Information System (CBIS)

This category of information system depends mainly on the computer for handling business application. System analysis develops different types of information system to meet variety of business needs. There is class of system known as computer based information system. They are categorized in the following 6 classes **(Detailed discussion to be done in Unit - II)**: **i)** Transaction Processing System (TPS), **ii)** Management Information System (MIS), **iii)** Decision Support System (DSS), **iv)** Executive Support System (ESS), **v)** Office Automation Systems (OASs) and **vi)** Business Expert Systems (BESs).

Unit - II
Information Systems in Organisations

Management Information System

It is defined as an 'integrated user-machine system designed for providing information support operational control, management control and decision making functions in an organisation'.

- **Constraints in operating a Management Information System (MIS)**

a) Non-availability of experts who can diagnose the objective of the organisation and provides a desired direction for installing and operating system. This problem may be overcome by grooming internal staff which should be preceded by proper selection and training.

b) Experts usually face the problem of selecting the sub-system of MIS to be installed and operated upon. The criteria which should guide the experts depend upon the need and importance of a function for which MIS can be installed first.

c) Non-availability of cooperation from staff is a crucial problem which should be handled tactfully. This task should be carried out by organising lectures and explaining to them about the utility of the system.

Expert System

- **Expert System**

It is defined as a computer program that attempts to represent the knowledge of human experts in the form of heuristics. The term 'heuristics' is derived from the Greek word 'eureka' this means to 'discover'.

- **Difference between Expert System and Decision Support System**

The two CBIS subsystems differ in two major ways –

i) A DSS consists of routine that reflect how the manager believes a problem be solved as well as the manager's style and capabilities. Whereas an expert system offers the opportunity to make decisions that exceeds the Manager's capabilities.

ii)The second difference between expert system and DSS is the ability of the expert system to explain its line of reasoning in reaching a particular solution.

- **What are the key reasons behind a successful expert system development?**

Prof. Gill identified five areas where the development project could be improved.

i) Coordinate expert system development with the strategic business plan and the strategic plan for information resources.

ii) Clearly define the problem to be solved and thoroughly understand the problem domain.

iii) Pay particular attention to the legal and ethical feasibility of the proposed system.

iv) Fully understand both users' concerns about the development project and their expectations of the operational system.

v) Employ management techniques designed to keep the attrition rate for developers within acceptable limits.

These are the ingredients that should be incorporated into any development projects.

Artificial Intelligence

- **Artificial Intelligence**

It is the activity of providing such machines as computers with the ability to display behaviour that would be regarded as intelligent if it were observed in humans. It represents the most sophisticated computer application seeking to duplicate some types of human reasoning.

- **Areas Involved**

i) Neutral Networks: They are highly simplified models of the human nervous system that exhibit abilities such as learning, generalization and abstraction. These abilities enable the models to learn human like behaviour.

ii) Learning: It encompasses all of the activity that enables the computer or other device to acquire knowledge in addition to what has been entered into its memory by its manufacturer or by programmers.

iii) Natural Language Processing: It enables users to communicate with the computer in different languages and enables the computer to check spelling and grammar.

Decision Support System (DSS)

It is interactive software-based systems intended to help managers in decision making by accessing large volumes of information generate from various related information systems involved in organisational business processes such as office automation system, transaction processing system etc.

- **Steps in constructing a Decision Support Systems (DSS)**

a) Identification f the problem: In this stage the developer and the knowledge engineer interact to identify the problems. The following points are discussed –

- The scope and extent are analysed
- The return of investment analysis is done
- The amount of resources needed is identified
- Areas in the problems that can give much trouble are identified and a conceptual solution of that problem is found and over all specification is made.

b) Decision about mode of development: Once the problem is identified, the immediate step would be to decide about the vehicle for development. In this stage various shells and tools are identified and analysed for their suitability. These tools whose features fit the characteristics of the problems are analysed in details.

c) Development of a prototype: Before the development of a prototype we decide the knowledge level to solve the particular problem. After this the taste of knowledge begins the knowledge of Engineer and developer which interact frequently and domain specific knowledge is entranced. When knowledge representation scheme and knowledge is available a prototype is constructed.

d) Prototype validation: The prototype under goes the process of testing for various problems and revision of the prototype takes place.

e) Planning for full scale system: In prototype construction, the area in the problem that can be implemented with the relative case is the first choice extensive planning is done. Each subsystem development is assigned, a group leader and schedules are drawn.

f) Final implementation, maintenance and evaluation: It is the final stage of DSS Life cycle. The full scale system developed is implemented at the basic resources requirements are fulfilled and parallel conversion.

- **Difference between MIS and DSS**

Points of Difference	MIS	DSS
Focus	On structured tasks and routine decisions	On semi-structured tasks requiring managerial judgement
Emphasis	On data storage	On data manipulation
Data Access	Offers only indirect access by managers on computer expert	Direct access by managers
Reliance	On Computer Expert	On Manager's own judgement

- **Group Decision Support Systems (GDSS)**

It is an interactive computer based system that facilitates solution of unstructured problems by a set of decisions makers working together as a group.

A GDSS is superior then DSS because in GDSS the decisions are taken by a group of DSS. So it is superior to the DSS.

REFERENCES

Unit - I: Key Information Systems Concept

- **ICAI/ICWAI** Study Materials

Unit- II: Information Systems in Organisations

- **ICAI/ICWAI** Study Materials