1. Systems development is the process of defining, designing, testing, and implementing a new software application or program.
2. System analysis. : the act, process, or profession of studying an activity (such as a procedure, a business, or a physiological function) typically by mathematical means in order to define its goals or purposes and to discover operations and procedures for accomplishing them most efficiently.
3. Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development.
4. Characteristics of a System

1. Organization

2. Interaction

3. Interdependence

4. Integration

5. A central objective

ORGANIZATION:

Organization implies structure and order. It can also be defined as the arrangement of components that helps to achieve objectives.

For eg: - in the design of a business system, the hierarchical relationships starting with the president on top and leading towards the workers represents the organization structure. So this gives the authority structure and specifies the formal flow of communication.

Like wise a computer system is designed around an input device, a central processing unit, an output device and one or more storage units.

INTERACTION:

Interaction refers to the manner in which each component functions with other components of the system.ie, there should be an interrelationship between each components of a system.

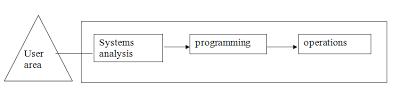
For eg: - in an organization there should be interaction between purchase department and production department, same way advertising with sales, payroll with personnel.

In computer system, the central processing unit must interact with the input device to solve a problem. In turn the main memory holds programs and data that the arithmetic unit uses for computation.

INTERDEPENDENCE:

This is one of the important characteristics of a system.

Interdependence means the parts or the components of an organization or computer system depend on one another. Each component or parts should depend on other components of an organization. One component or subsystem depends on the input of another subsystem for proper functioning, ie, the output of one subsystem is required input for another subsystem. For example: - A decision to computerize an application is initiated by the user, analyzed and designed by the analyst, programmed and tested by the computer operator. In the below figure:- none of these persons can perform properly without the required input from others in the computer center subsystem.



INTEGRATION

Integration refers to the holism of systems. Synthesis follows analysis to achieve the central objective of the organization. It is concerned with how a system is tied together. It is more than sharing a physical part or location. It means that parts of the system work together within the system even though each part performs a unique function.

CENTRAL OBJECTIVE

The last characteristic of a system is its central objective. Objectives may be real or stated. The important point is that users must know the central objective of a computer application early in the analysis for a successful design and conversion.

1. Elements of a System

•Outputs and Inputs

•Processor

•Control

•Feedback

•Environment

•Boundaries and Interface

Inputs and Outputs- Inputs are the elements that enter the system for processing and output is the result of processing.

•Processor- It is the element that involves the actual transformation of input into output.

Control- The control element guides the system.

•Feedback- Output is compared against performance standards.

•Environment- It is the suprasytem within which an organization operates.

•Boundaries and Interface- A system should be defined by its limits.

1. Types of System

* Physical – These are tangible entities that may be static or dynamic in operation. For example- parts of a computer center are the desks, chairs etc. that facilitate operation of the computer. They are static and a programmed computer is dynamic.
* Abstract System – These are conceptual or non physical entities. For example- the abstract conceptualization of physical situations. A model is a representation of a real or planned system. A model is used to visualize relationships.
* Deterministic System – It operates in a predictable manner and the interaction between parts is known with certainty. For example: Two molecules of hydrogen and one molecule of oxygen makes water.
* Probabilistic System – It shows probable behavior. The exact output is not known. For example: weather forecasting, mail delivery.
* Social System- It is made up of people. For example: social clubs, societies
* Human Machine System- When both human and machines are involved to perform a particular a particular task to achieve a target. For example:- Computer.
* Machine System- Where human interference is neglected. All the tasks are performed by the machine.
* Natural System- The system which is natural. For example- Solar system, Seasonal System.
* Manufactured System- System made by man is called manufactured system. For example- Rockets, Dams, Trains.
* Permanent System- Which persists for long time. For example- policies of business.
* Temporary System- Made for specified time and after that they are dissolved. For example- setting up DJ system.
* Adaptive System- respond to change in the environment in such a way to improve their performance and to survive. For example- Human beings, animals.
* Non Adaptive System-The system which doesn't respond to the environment. For example- Machines
* Open System – It has many interfaces with its environment. It interacts across its boundaries, it receives inputs from and delivers outputs to the outside world. It must adapt to the changing demands of the user.
* Closed System – It is isolated from the environmental influences. A completely closed system is rare.

1. System Model
   1. to conceptualize and construct systems
   2. As a field of study systems modeling has emerged with the development of system theory and systems sciences.
2. Categories of Information

* Executive support systems (ESS)

Designed to help senior management make strategic decisions. An ESS gathers, analyses and summarises the key internal and external information used in the business. ESS typically involve lots of data analysis and modelling tools, such as "what-if" analysis, to help strategic decision-making.

A good way to think about an ESS is to imagine the senior management team in an aircraft cockpit, with the instrument panel showing them the status of all the key business activities.

* Management information systems (MIS)

Primarily concerned with internal sources of information. MIS usually take data from the transaction processing systems (see below) and summarise it into a series of management reports.

MIS reports tend to be used by middle management and operational supervisors.

* Decision support systems (DSS)

Specifically designed to help management make decisions in situations where there is uncertainty about the outcomes of those decisions.

DSS use tools and techniques to help gather relevant information and analyse the options and alternatives. DSS often involves use of complex spreadsheet and databases to create "what-if" models.

* Knowledge management systems (KMS)

Exist to help businesses create and share information. They are typically used in businesses where employees create new knowledge and expertise, which can then be shared by other people in the organisation to create further commercial opportunities. Good examples include firms of lawyers, accountants and management consultants.

KMS are built around systems which allow efficient categorisation and distribution of knowledge. For example, the knowledge itself might be contained in word processing documents, spreadsheets, PowerPoint presentations. internet pages etc. To share the knowledge, a KMS would use group collaboration systems, such as an intranet.

* Transaction processing systems (TPS)

Designed to process routine transactions efficiently and accurately.

A business will have several TPS; for example:

Billing systems to send invoices to customers

Systems to calculate the weekly and monthly payroll and tax payments

Production and purchasing systems to calculate raw material requirements

Stock control systems to process all movements into, within and out of the business

Office automation systems

Try to improve the productivity of employees who need to process data and information.

Perhaps the best example is the wide range of software systems that exist to improve the productivity of employees working in an office (for example, Microsoft Office XP), or systems that allow employees to work from home or whileon the move.

1. SDLC

The systems development life cycle (SDLC), also referred to as the application development life-cycle, is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying an information system.