

# Introduction to system Analysis

2011

## What is a System?

- ❑ A system is an orderly grouping of independent components linked together according to a plan to achieve a specific object.

system

# Characteristics of a system

There are five types of characteristics for a system. They are

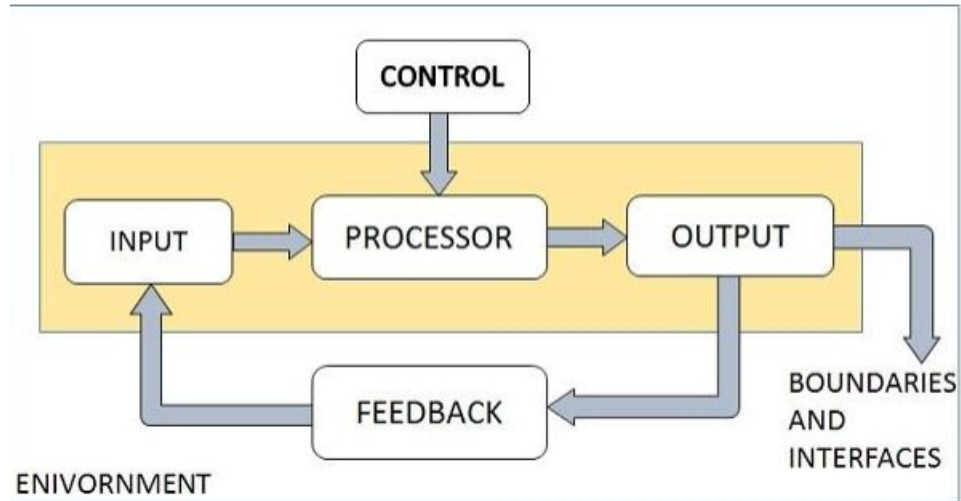
1. Organization
2. Interaction
3. Interdependence
4. Integration
5. A central objective

## Briefly Describe the characteristics of a system.

- ❑ **Organization** implies structure and order. It can also be defined as the arrangement of components that helps to achieve objectives.
- ❑ **Interaction:** It refers to the manner in which each component functions with other components of the system.
- ❑ **Interdependence:** It means that parts of the organization or computer system depend on one another.
- ❑ **Integration:** It refers to the holism of systems. It is concerned with how a system is tied together.
- ❑ **Central Objective:** A system should have a central objective.
- ❑ Objectives may be real or stated.

## What are the element of a system?

- ❑ A system has three basic elements **input, processing and output**. The other elements include control, feedback, boundaries, environment and interfaces.
- ❑ Can you have a viable system without feedback?
- ❑ Yes. You can have a viable system without feedback but it is highly impractical and is not recommended.



# What are the elements of a system?

**Outputs and inputs:** A major objective of a system is to produce an output that has value to its user. In order to get a good output, inputs to system must be appropriate.

**Processors:** It is the element of a system that involves the actual transformation of input into output. It is the operational component of a system.

**Control:** The control elements guide the system.

**Feedback:** Feedback measures output against a standard in some form of cybernetic procedure that includes communication and control.

**Environment:** The environment is the “supra-system” within which an organization operates.

**Boundaries and Interfaces:** A system should be defined by its boundaries- the limits that identify its components, processes, and interrelationships when it interfaces with another system.

system

## Types of system

- ☐ Physical or Abstract Systems
- ☐ Open or Closed Systems
- ☐ Adaptive and Non Adaptive System
- ☐ Permanent or Temporary System
- ☐ Man–Made Information Systems

types of system

## What are the differences between Physical & Abstract System?

Physical System	Abstract System
Physical systems are tangible entities.	Abstract systems are conceptual entities.
They can be seen and counted.	They can't be seen.
Is a system based only on matter and energy.	It can be the result of design or invention.
For example, the physical parts of a computer center.	For examples, models– the abstract conceptualization of physical situations.



## What are the difference between open system and closed system?

Open System	Closed System
A system which can exchange energy and matter with the environment.	A system which is protected from the environment.
Elements of the system will vary with time.	Elements of the system won't vary with time.
There is no boundary outside the system.	There is a boundary around the system.
For example, Fire-camp	For examples, intake water bottle.

## ***Adaptive and Non Adaptive System***

- ☐ Adaptive System responds to the change in the environment in a way to improve their performance and to survive. For example, human beings, animals.
- ☐ Non Adaptive System is the system which does not respond to the environment. For example, machines

system file

## ***Permanent or Temporary System***

- ❑ Permanent System persists for long time. For example, business policies.
- ❑ Temporary System is made for specified time and after that they are demolished. For example, A Data Processing system is set up for a program and it is dissembled after the program

system file

## ***Social, Human-Machine, Machine System***

- ❑ Social System is made up of people. For example, social clubs, societies.
- ❑ In Human-Machine System, both human and machines are involved to perform a particular task. For example, Computer programming.
- ❑ Machine System is where human interference is neglected. All the tasks are performed by the machine. For example, an autonomous robot

system file

## ***Man-Made Information Systems***

- ❑ It is an interconnected set of information resources to manage data for particular organization, under Direct Management Control (DMC).
- ❑ This system includes hardware, software, communication, data, and application for producing information according to the need of an organization.
- ❑ **Man-made information systems are divided into three types -**
  - ❑ **Formal Information System** - It is based on the flow of information in the form of memos, instructions, etc., from top level to lower levels of management.
  - ❑ **Informal Information System** – It is employee based system which solves the day to day work related problems.
  - ❑ **Computer Based System** - This system is directly dependent on the computer for managing business applications. For example, automatic library system, railway

## What will be the aftermath of an open system?

❑ An open system is directly connected with the environment. So the system will be affected by the environment soon. As a result many change will be occurred in system. If the system is related to temperature then the temperature will be changed and will be at same temperature of the environment. After a long time our main objective will be lost

❑ What will be the aftermath of an closed system?

❑ A closed system is not directly connected with environment. It is protected from environment by a boundary. So the environment can not affect a closed system. And system never been corrupted. The system neither loss any energy to environment nor gain any energy from the environment. So, after a long time the system remains almost same.

# Systems Models

- ❑ ***Schematic Models*** : 2D, information flow, material flow, and information feedback
- ❑ ***Flow System Models*** : material, energy, information flow orderly,
- ❑ ***Static System Models***: one pair relationships, activity time, cost quantity, Gantt chart, static circuit.
- ❑ ***Dynamic System Models***: ongoing, constantly changes status, input, process, program, output

# Categories of Information

## ***Strategic Information***

• long range planning policy for next few years, trends in revenue, financial investment, human resource, population growth ,DSS

## ***Managerial Information*** : Middle management for short, sales analysis, cash flow, projection, annual financial

## ***Operational information***: low management for daily and short term planning to enforce day-to-day operational activities. For example, keeping employee attendance records, overdue purchase orders, and current stocks available.



# System Analysis and Design (SAD)

- ❑ Mainly deals with the software development activities. Success of any system depends on good SAD.
- ❑ SAD, as performed by the system analysts, seeks to understand what human need to analyze data input or data flow systematically,
- ❑ process information in the context of a particular business.
- ❑ Furthermore, system analysis and design is used to analyze,
- ❑ design and implements in the support of users and the functioning of business that can be accomplished through the use of computerized information system.

# System Analysis

1. To know how a system currently operates and
2. To identify the users requirements in the proposed system

is a process of collecting factual data, understanding the process involved, identifying problems and recommending feasible suggestion for improving the system functioning. This involves studying the business processes, gathering operational data, understand the information flow, finding out bottlenecks and evolving solutions for overcoming the weakness of the system so as to achieve the organizational goals. System analysis also includes subdividing of complex process involving the entire system, identification of data store and manual process.

# System Design

## 1. PRELIMINARY OR GENERAL DESIGN:

- ❖ general design, specified,
- ❖ The costs of implementing these features and the benefits to be derived are estimated. If the project is still considered to be feasible (possible), we move to the detailed design stage.

## 2. STRUCTURED OR DETAILED DESIGN

More structured, blue print, relationship among components, input, output, databases, forms, codifications scheme, and process specification.

# STRUCTURED OR DETAILED DESIGN

1. Defining precisely the required system output
2. Determining the data requirement for producing the output
3. Determining the medium and format of files and databases
4. Devising processing methods and use of software to produce output
5. Determine the methods of data capture data input
6. Designing input forms
7. Designing codification scheme
8. Detailed manual procedures
9. Documenting the design

## What is the concept of prototyping?

- ❑ An alternative to “paralysis by analysis” is an advanced technique called prototyping. Prototyping recognizes problems of cognitive style and uses advanced computer technology. It advocates building a simple system through trial and error and refining it through an iterative process.

PROTOTYPING



1.

2.

3.

system



system ENTROPY



candidate system





- i.
- ii.
- iii.
- iv.



- i.
- ii.
- iii.
- iv.

system change



- 1.
- 2.
- 3.
- 4.



- 
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- 
- 

candidate system



- 1.
- 2.
- 3.
- 4.



- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

system analyst

Which skill is favored over the other in the stages: Feasibility study, Design, Implementation, Maintenance.

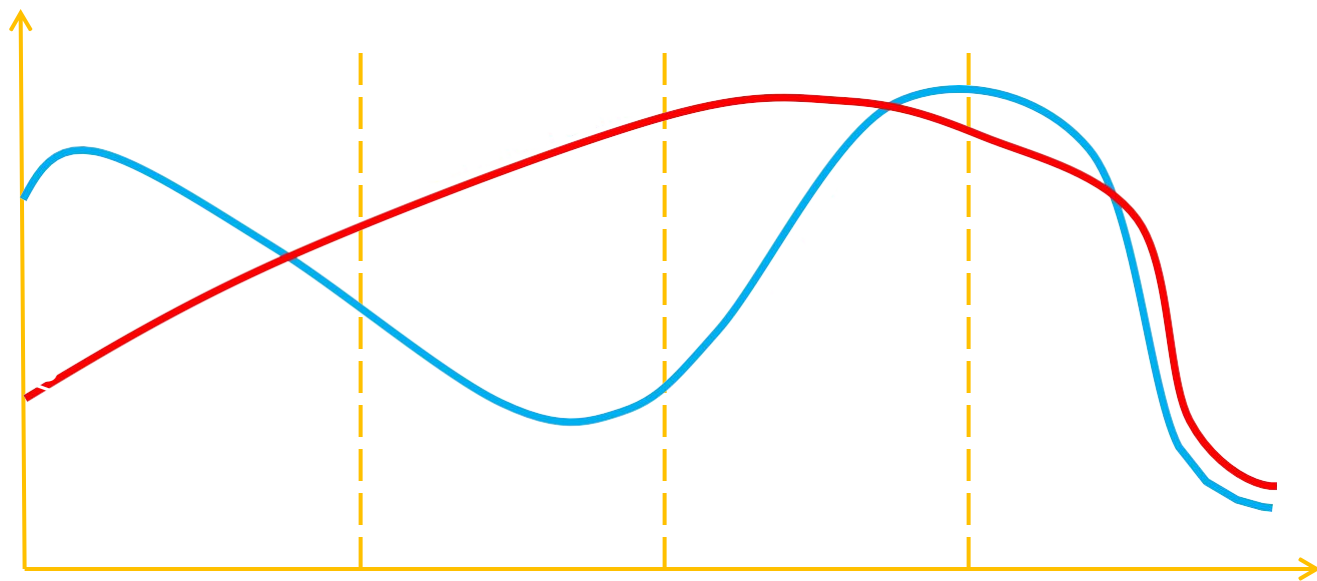
i.

ii.

iii.

iv.

system analyst



system analyst

## What are the pros and cons of the traditional approach to system analysis?



1.

2.

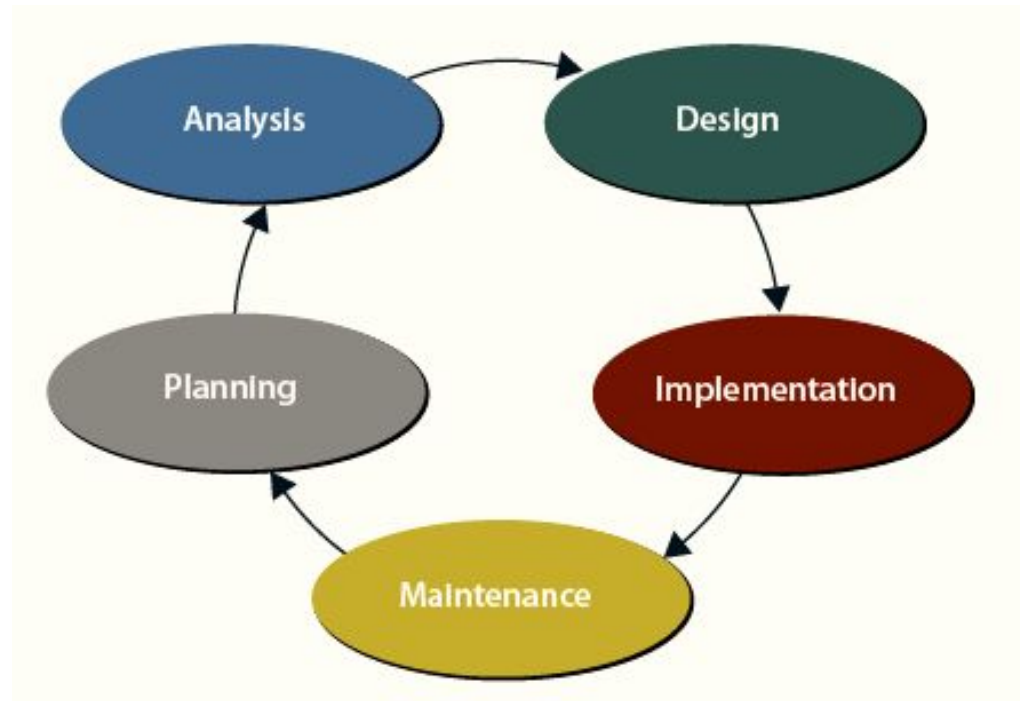
3.

4.

Traditional Analysis



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feasibility study



feasibility study



system design



initial investigation



initial investigation



system requirements





Analyst User Interface





interview



BASIS FOR COMPARISON	STRUCTURED INTERVIEW	UNSTRUCTURED INTERVIEW
Meaning	Structured Interview is one in which a particular set of predetermined questions are prepared by the interviewer in advance.	Unstructured Interview refers to an interview in which the questions to be asked to the respondents are not set in advance.
Data collection	Quantitative	Qualitative
Research	Descriptive	Exploratory
Type of Questions	Closed-ended questions	Open-ended questions
Factors evaluated	Explicit	Implicit
Used by	Positivist	Interpretivist
Application	To validate results, when the number of candidates is quite large.	To probe personal details of the candidate, so as to judge if he is the right person for the job.



Questionnaire



system analysis



1.

2.

3.

4.

# system analysis



Traditional Approach	Structured Approach
This structured approach looks at the system from a top-down view. It is a formalized step by step approach.	Structured analysis is a set of techniques and graphical tools that allow the analyst to develop a new kind of system.
There has no proper way in this approach.	DFD, Data Dictionary are some examples of structured approach.

SYSTEM ANALYSIS



BASIS FOR COMPARISON	VALIDITY	RELIABILITY
Meaning	Validity implies the extent to which the research instrument measures, what it is intended to measure.	Reliability refers to the degree to which scale produces consistent results, when repeated measurements are made.
Instrument	A valid instrument is always reliable.	A reliable instrument need not be a valid instrument.
Related to	Accuracy	Precision
Value	More	Comparatively less.
Assessment	Difficult	Easy



system analysis





investment



REC