

Define the Problem: With their *dynamic* nature, the problems must reside in an organization. Therefore, the first step in Management Information System design is to know the problem in detail. This is achieved by a continuous and iterative process of:

1. Stating the information need.
2. Asking questions about that need.
3. Suggesting the interpretations of that need.
4. Detailing the original statement.
5. Reviewing the more detailed statement of need with management.

Set System Objectives: Like other functional areas, the manager should set objectives in terms of design of information system.

Although it is a difficult task to set objectives, because most of the organizations set their objectives very ambiguously like “improve efficiency;” meet the production schedule” and so on. In order to achieve the objectives successfully they should be *specific*.

After setting the objectives, *system designer* should state them by using *descriptive statement*, or *flowchart*, or *data flow diagrams* and so on, to convert the objectives for the manager.

Establish System Constraints: Constraints mean problems, boundaries or restriction that enable the designer to stipulate the condition under which objective may be accomplished and to consider the limitation that restricts the design.

Determine Information Need: A clear statement of information need is fundamental and necessary for a good system design. If the manager does not convey his or her information needs, a good design will not be prepared. The type of information needs depends on two factors:

- Personal managerial attributes of the individual manager.
- Organizations environment in which the decisions are made.

Determine Information Sources: Determination of information needs and to determine the information source.

For designing a new system, the existing system needs to be analyzed. There are two approaches. One is in favor of this and other says there is no need of analyzing the existing system. However, in a system design, the analysis of existing system becomes a necessary requirement.

There are two techniques for analysis and synthesis for discovering the information source:

- Input/output analysis using decision table.

- Multidimensional flow using flow chart. So it is the next design step to prepare a list that matches needs and sources

Develop alternative conceptual designs and select one: Every problem can be solved in a number of ways. So before selecting the most feasible alternative, one has to evaluate each alternative in the light of:

1. Compare expected performance of the conceptual design with the objectives of the system.
2. Prepare a rough or preliminary cost-effectiveness analysis of the information system.
3. Examine the flow chart for strength and weakness of each conceptual design.
4. Expand the conceptual design in more details, if none of these provides a preferred design.

Document the System Concept: In this stage manager participation to the design process shows what input, output, master files and rules for processing are required.

The general system flowchart is a common method of indicating the general structure of a computer-based information system. At this stage the formats of *input* are designed. The *input* received from *outside sources* is then converted into machine usable forms.

The output data definition includes the specifications of the destination like where they go and in what form, etc. Including the specification in what percentage one gets the output and at what frequency and form it will take, i.e., hard copy, soft copy, etc. After preparing the output and after input has been documented, the last step is to prepare a report for the manager.

Prepare the Conceptual Design Report: The conceptual design report, is in a sense a proposal for the spending of funds and for organizational change. It consists of performance specification, function to be performed by the system and means by which each function is measured. Along with this report separate documentation should be provided.

Detailed Design

In order to make a detailed design, first of all the system designers have to gain the support of all the staff members from top to bottom level. To seek their acceptance it is better to involve them in the designing process.

The detailed design is done for the areas of designing user interface, data design and process design.

1. **User Interface Design:** The user interface design activity is related to facilitate the interaction between the user and their computer based application. It includes:
 - ❖ What operating system should the Management Information System be based on?

- ❖ Focus on designing attractive and effective forms of user input and output.
- ❖ Design methods of converting source document into object document means converting human understandable form to machine understandable language.

This activity produces the detailed design specifications for information product like display screen, forms, documents and reports.

2. **Data design:** It involves:

- ❖ The design of the structure of databases i.e. what type of specific data element is carried.
- ❖ Entities and their characteristics.
- ❖ The relationships between these entities.
- ❖ The integrity rules, i.e., how data is maintained and used in the information system.

3. **Process Design:** It involves the design of process i.e., the design of software programs, procedure needed by information system. At this stage the developer has to decide about the detailed specification of software, that is either software has to be purchased, or developed or it is purchased and modified according to the proposed system requirements.

The product of this stage is to know system specifications means, the details of a proposed system. So the system analysts along with management and information system user can use their expertise to design a new or improved Information System.

Finally, system design should be such, which specifies what types of hardware, software, data, people and network resources are required to make a better Information System. It also specifies how such resources will convert data resources into final information product which is needed or expected by the end user from the Information System.

Before implementation and after designing the proposed system, the system must be tested because this is also one of the major activities of a detailed design.

There are three ways to get system feedback on the viability of designed Information System:

1. Modeling
2. Simulation
3. Test planning.

The importance of testing at the designing stage is much because any fault or problem discovered at this stage will be easily removable, less costly and will reduce overall project cost.

