# SYSTEM ANALYST AND TOOLS

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The system analyst has two primary objectives

- Assessment objective

- Assistance objective

**Assessment objective :** A system analyst has to observe, understand and evaluate the interactions which routinely occurs as a part of the Job under investigation.

Herein the analyst has to know.

- What is being done ?

- Who is doing it ?

- Why is it being done ?

- How is it being done ?

- What are major problems in doing it ?

**Assistance Objective :** A system analyst is to provide alternative solutions to make the existing system more efficient.

- For this job, he seeks the help of the computer. At such times he acts like a communication-link between technology and user.

- Analyst now finds out other ways to deal with the existing problem and also checks the benefits and liabilities associated with these alternative approaches.

- Better assessment of problems will provide better assistance, and probably the presence of other kinds of assistance gives the analyst a broader perspective for the assessment.

# SYSTEMS ANALYSIS TOOLS

- The *first* and obvious purpose of a system analyst's work is to establish precisely
  - What the system is intended to achieve?
  - What information enters it, leaves it and is held within it?
- Only when he knows to what objectives a system is directed, and in a position to change or replace it.
- The *second* purpose is to enable him to communicate with management at all levels, so that the findings of his investigations can be confirmed and possible changes discussed on the basis of common knowledge.
- The *third* purpose is to design the system i.e. enter into system design stage.

Now we are discussing a few tools which can be used to establish these requirements of a system analyst's job.

- Fact Finding Tools
  - Interviews
  - Observations
  - Questionnaires
- Graphical Tools
  - DFD
  - Decision Trees
  - Decision Tables
  - Flow Charts
  - Organisation Chart
- Other Tools
  - Data Dictionary
  - Structured English

# Fact Finding / Data Gathering Tools

- In System Analysis, the most important step to begin a task is the fact finding of the system to be analysed. The system analyst does not have to know only what is happening in the present existing system, but also has to know what improvements  are to be carried out.

- The main tools for fact finding are

- Interviews

- Questionnaire

- Observations

# Data Flow Diagram (DFD)

- It is also known as Bubble chart .
- After the fact finding, the system analyst has to properly record the flow of documents within the organisation in the form of a chart known as Data Flow Diagram (DFD).
- The very purpose of such a chart is to clearly show to the system analyst about the various documents being handled within the system, their organisation along with some major actions taken on those documents.
- To make a DFD, we can use various symbols to show the documents, direction of movement, the process of matching the documents, destroying or filing them etc. These symbols may vary from organisation to organisation.

- *DFD Symbols*

We shall consider the following symbols as shown

- A square defines a source or destination of system data.          OR

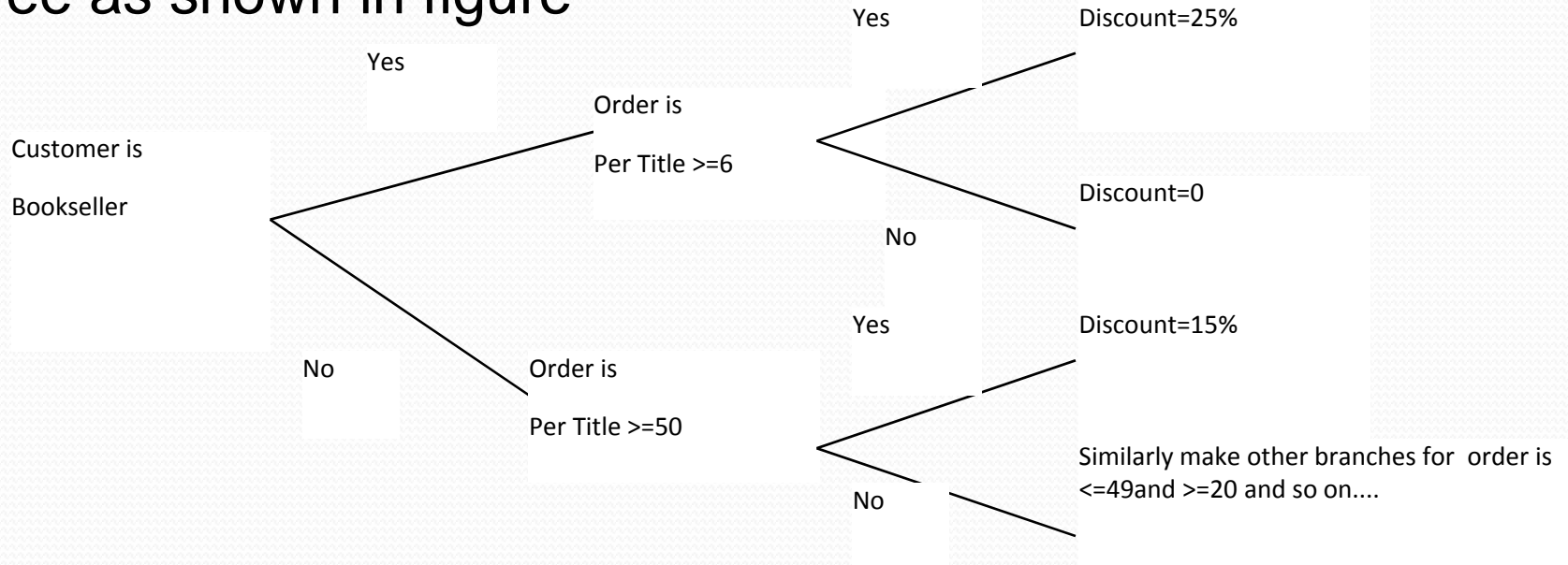- An arrow identifies data flow-data in motion. It is a pipeline through which information flows.

- A circle or a "bubble" represents a process that transforms incoming data flow into outgoing data flow.

- An open rectangle is a data store-data at rest, or a temporary repository of data.

# Decision Tree

- Decision tree can be defined as the graphical representation of conditions and outcomes resembling the branches. A decision tree has as many branches as there are logical alternatives. It simply sketches the logical structure based on the stated policy.

- It is an excellent tool, because, it is easy to construct, easy to read, and easy to update.

- It shows only skeletal aspects of picture however, and does not lend itself to calculations. The alternative of decision tree is Structured English.

Consider an example : A publisher gives a different discount to different customers. If customer is bookseller, publisher gives a trade discount of 25% for the order of 6 copies or more per title. If orders from libraries and individuals, 5% allowed on orders of 6-19 copies per book title; 10% on orders for 20-49 copies per book title; 15% for the order of 50 or more per book title.
The above problem can be explained with the help of decision tree as shown in figure

Customer is

Bookseller

Yes

Order is

Per Title >=6

Yes

Discount=25%

No

Discount=0

No

Order is

Per Title >=50

Yes

Discount=15%

No

Similarly make other branches for order is <=49and >=20 and so on....

# Decesion Table

- Decision Table is most extensively used in applications dealing with artificial intelligence where there need to be a set of If-----then-----else rules to be applied, before taking a given decision. Their use is becoming more and more popular. The general structure of a decision table consists of four quadrants as shown in figure

| Condition stub | Condition entries |
|---|---|
| Action stub | Action entries |

|  | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| i) Is it cold ? | Yes | Yes | No | No |
| ii) Is it wet ? | Yes | No | Yes | No |
| i) Take Coat | X | X |  |  |
| ii) Take Umberella | X |  | X |  |
| iii) Take Neither |  |  |  | X |

# Organisation Chart

- An organisation chart is a graphical representation of management structure/hierarchy. In the organization chart, different levels of hierarchy shown. For example there may be a chart at the level of the complete organisation giving the level of a department providing details upto the level of a bottom level. This chart helps to clearly understand the structure with respect to the level of the person and the name of the individual occupying a given level.
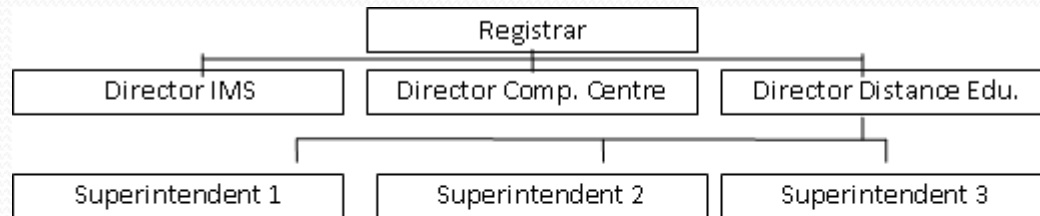
# Structured English

COMPUTE-DISCOUNT
   Add up the number of copies per book title
IF order if from bookstore
   and-IF       order is for 6 copies or more per book title
       THEN:  Discount is 25%
   ELSE       (order is for fewer than 6 copies per book title)
       SO:  no discount is allowed
ELSE  (order is from libraries or individual customers)
  SO-IF       order is for 50 copies or more per book title
       discount is 15%
   ELSE-IF order is for 20 to 49 copies per book title
       discount is 10%
   ELSE-IF order is for 6 to 19 copies per book title
       discount is 5%
   ELSE       (order is for less than 6 copies per bok order)
    SO :     no discount is allowed

# Data Dictionary

A data dictionary is a structured repository of data which keep details of the contents of data flows, processes, and data store.

When constructing Data Dictionary, analyst should remember several points

- Each data flow in DFD has one data dictionary entry

- Definition must be readily accessible by name

- There should be redundancy in data definition

- The procedure for writing definitions should be precise.

# PROS AND CONS OF SYSTEM ANALYSIS TOOLS

- The primary strength of the DFD is its ability to represent data flows. It may be used at high or low levels of analysis and provides good system documentation. However, the tool only weakly shows input and output detail.

- The data dictionary helps the analyst simplify the structure for meeting the data requirements of the system. If may be used at high or low levels of analysis, but it does not provide functional details, and it is not acceptable to many non-technical users.

- Structured English is best used when the problem requires sequences of actions with decisions.

- Decision trees are used to verify logic and in problems that involve a few complex decisions resulting in a limited number of actions.

- Decision trees and decision tables are best suited for dealing with complex branching routines such as calculating discounts or sales commissions or inventory control procedures.

- **A decision table is perhaps the most useful tool for communicating problem to the user.**

# Thanks!

- For any question…      Leave comment