

UNIT - 2

Information Requirement Analysis

* Requirement Analysis :-

Requirement analysis is very important and essential activity after gathering all the requirement from the client. This activity review all the requirements and may provide a graphical view of the entire system.

Requirement analysis is done to obtain a clear understanding of the need of the client and the user. All the requirement have been specified at the proper level of abstraction.

• Problem during the analysis -

1- Completeness and consistency - One major problem is how to organise the information obtained so the information can be effectively evaluated for completeness and consistency.

2- Contradictions - Another major problem is resolving the contradiction that exist in the information from the different parties.

* Requirement problems - Most important requirement problems that the analyst has to identify and eliminate in the problem. Once the analyst detect any inconsistency and incompleteness in the gathered requirement, the requirement analysis and the negotiation process gone under the process.

An incomplete requirement is one where some of the requirements have been overlooked.

★ Requirement Analysis Principle:-

It is categorized in five properties which are given below -

1. Model of data domain
2. Model function
3. Model behaviour
4. Partition the model
5. Model assesse

★ Information Modelling :-

Information modelling is a representation of concept relationship, constraints, rules and operations to specify data semantics. It can provide the sharable, stable and organised structure of information requirement. Once all the requirements have been gathered and analysed, any computer base system can be model these requirements.

Using a representation of input processing output user-interface, a software system engineer can create a model of system components.

• Types of information models :-

Information model can be divided into following two categories -

- Logical models
- Physical models

Logical models - The logical model shows that

what a system can do any task and which type of logical and mathematical application will be involved. The logical model include essential models, conceptual model and business model.

2- Physical model — The physical model show not only what a system is do mathematically and logically but it checked (how the system is physically and technically implemented). They are implementation dependent because they reflect by technology choice.

Tools for Information Modelling :-

1. Process modelling tools
2. Logic modelling tools
3. Data modelling tools

1- Process modelling tools — Process modelling is a technique for organising and documenting the structure and flow of data through a system process and what procedure to be implemented by a process or developing team.

2- Logic modelling tools — The logical process model are used to document an information system for the implementation of new technology. In the

3- Data modelling tools — In the data process model, it is a process model and the abstract representation of development process. A development process is a set of activities, ^{done} together with an ordering relationship between the activities. The main tool The main tool is the information

modelling is data flow diagram.

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* Data Flow Diagram :-

A DFD is a 'graphical representation' of the flow of data through an information system. DFD can also be used for the visualisation of the data processing.

The DFD are commonly used during the problem analysis. The DFD are quite general and are not limited to the problem analysis for software requirement specification. DFD are very useful in understanding a system and can be effectively used during the analysis.

A DFD show the flow of data through a system, it view a system as a function that transform the input into the desired output. Any complex system will not perform this transformation in a single step and data will typically undergo a series of transformation before it become the output.

• DFD Rules -

No process can have only outputs, if an object has only output then it must be source. No source and process can have only input. If an object has only input then it must be a sink.

A process has a limited source of output. In DFD, the delete and changes are the updation

process.

- **Developing DFD :-** The following steps are used to develop a DFD using a top-down approach.

Step 1- Make a list of business activities to use it to determine the various properties.

(a) External entities

(b) Data flow

(c) Process

(d) Data store

Step 2- Create a context diagram which show external entities and data flow to form the system. Do not show any detailed process or data stored.

Step 3- Check for error and make sure the labels are assigned to each process and data flow are meaning full.

Step 4- Develop a physical data flow diagram from the logical data flow diagram.

Step 5- Partition the physical data flow diagram by separating or grouping parts of the diagram in order to facilitate programming and implementation.

- **Advantages of DFD :-**

1- **Early implementation** - Freedom from committing to the technical implementation of the system is to early.

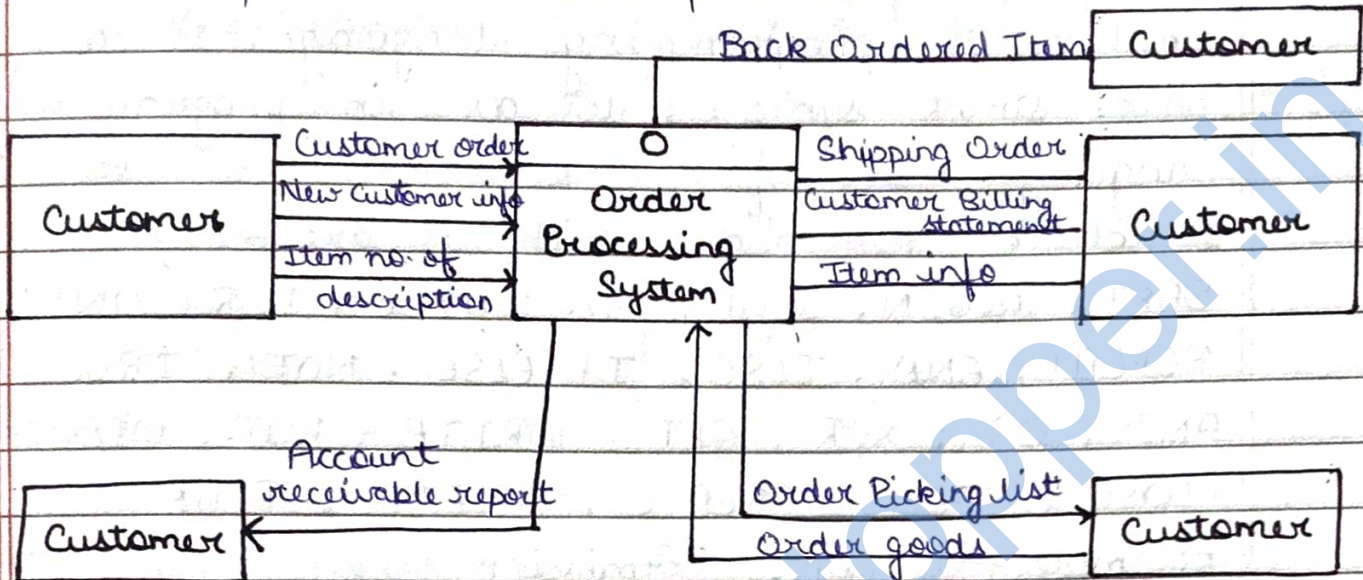
- 2- **Study independence** - Further understanding of the whole process of the system and its sub-systems.
- 3- **Analysis** - Analysis of a proposed system to determine if the necessary data and the process have been defined.
- 4- **Tool for communication** - It can be used as a tool to interact with user. An interesting use of DFD is to show them to user and the system analyst. The system analyst check the accuracy of the DFD.
- 5- **Reduced cost** - They allow the system analyst to describe each component used in the DFD. The analysis can then be performed to ensure that all necessary output may be obtained from the input data and that processing the logic reflected in the diagram.
Detecting and correcting errors and design the error diagram from input data.

✓ • Disadvantages of DFD -

- 1- During the implementation of development module within the DFD there are no chance to remove the error from the running stage.
For Example - Some input information is missing or is incorrect then it is not possible to overcome by the system analyst.
- 2- A DFD model does not specify the order in

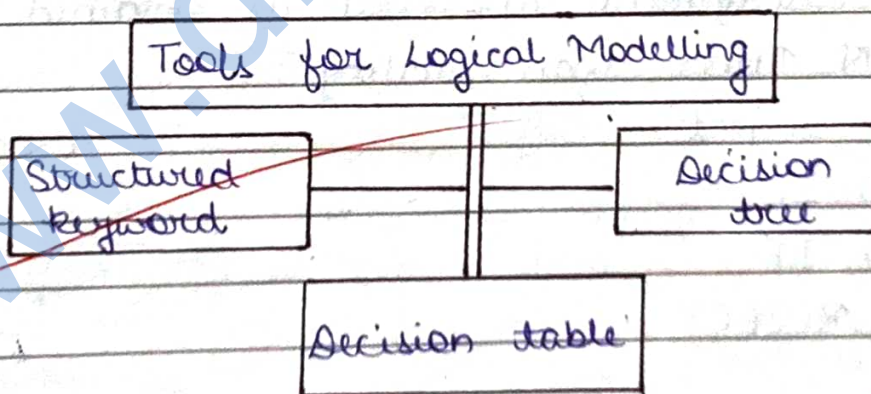
which the different process is to be executed.

3- Decomposition methodology to arrive at the successive level of DFD. Due to this reason several alternative DFD representation are possible.



Zero-Level DFD

★ Logical Modelling Tools :-



DFD through our versatile tool but not provide 100% accurate result for their user and for modelling all the complexities of the system.

Logic modelling involve representing the interlevel internal structure and the functionality of

the process in the DFD.

- **Structured keyword** - When the process logic involves formulas or iteration, structured decisions are not complex. The structured keyword is similar to programming language. It does not have strict syntax rules as in programming language. Some of the keywords are used in structured keywords which are -
START, BEGIN, STOP, DO, WHILE, FOR, UNTIL, REPEAT, END, ELSE, IF ELSE, NOT, TRUE, FALSE, AND, OR, XOR, GET, WRITE, PUT, UPDATE, CLOSE, OPEN, CREATE, DELETE, READ.

Example - Loan Permission

IF customer has an Bank account

THEN

IF Customer has no dues from previous account

THEN Allow loan facility

ELSE

IF Management approval is obtained

THEN Allow loan facility

ELSE reject

END IF

END IF

ELSE REJECT

- **Decision Table** - Decision table is a matrix representation of the logic of a decision which specify the possible condition and resulting the action. The decision tables are a convenient way to organise information in a systematic manner. The major drawback of a decision tree is

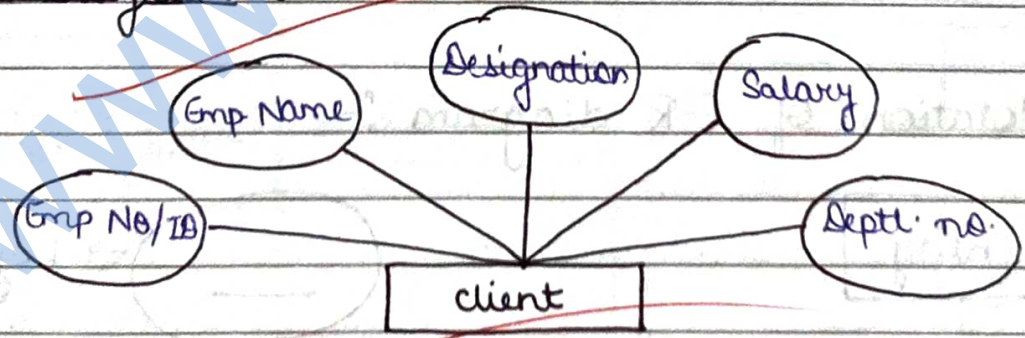
the lack of information in its unit given format.
 A decision table is a single representation of the relationship between condition and action.

Carriage Evaluation	1	2	3	4
Pass exam	Y	Y	N	N
Complete course work	Y	N	Y	N
Pass	X			
Refer		X	X	
Fail				X

• Decision tree—

Decision tree is a graphic representation of a decision process. The decision making involves several stages and at every stage each of the choice result in a different outcome. In other words, a decision tree is a predictive model, hence the decision tree are simple use for knowledge representation for a user and developer of application program.

* E-R Diagram :-



The basic E-R diagram was introduced by Peter for study the large database. E-R diagram or data schema is another means of capturing the data for their organisation. The ERD capture the entities,

their attributes and the relationship between the entities.

ERD represent the relationship of different databases with the help of different E-R diagram notations.

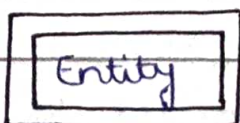
• Objectives of E-RD :- Benefits

- 1- Straight-forward relational representation - Having designed an E-R diagram for a database application the relational representation of the database model becomes relatively straight-forward.
- 2- Easy conversion of E-R diagram to other data model - The conversion of E-R diagram to a network or hierarchical model can be done easily.
- 3- Graphical representation for better understanding - A E-R model gives graphic and diagrammatical representation of various entities, its attributes and relationship between entities.

• Notation of E-R diagram :-



→ Key attribute



→ Weak entity



→ Derived attributes



→ Relationship

From the above E-R diagram, it is clear that these notations can make the databases strong because of multiple assumption with multiple notation will be encapsulated. The relationship notation diagram show the database mapping constraints which is given below:

- 1- One to one (1:1) mapping constraints
- 2- 1:M One to many mapping constraints
- 3- M:M Many to many mapping constraints
- 4- M:1 Many to one mapping constraints

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