

## UNIT - 4

### Application Development Methodology and Case Tools

\* Information Engineering :- Information engineering is the engineering discipline that deals with the generation and distribution analysis and use of information data and knowledge in the system. The component of information engineering include more theoretical such as machine learning, AI, CT and signal processing and theory and many more applied field such as natural language, bio medical images computing robotics. The fields of the information engineering is based heavily on mathematics such as probability calculus, algebra, optimization and complex analysis.

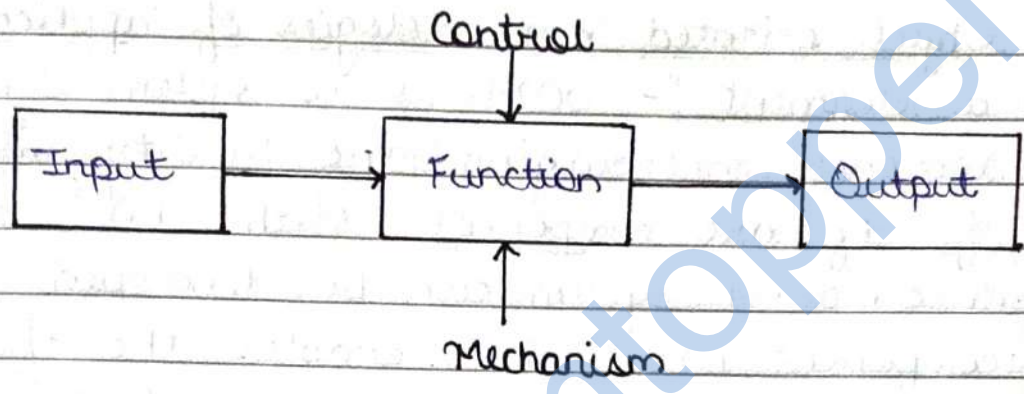
#### Tools of Information Engineering -

In the past, some area in information engineering such as signal processing used for Analog engineering, but nowadays most information engineering is done with digital computer. Many tasks in the information engineering can be parallelized and now a days the information engineering is carried out using CPU's and AI accelerators. There are also used quantum computers.



\* Structured Analysis and System design in information engineering :- SAPT is a system engineering and software engineering methodology for describing system as a hierarchy system. It is structured analysis modelling language which uses the two types of the diagram -

- 1- Activity models and
- 2- Data models



It is a system engineering and software engineering methodology for describing system as a hierarchy of function. SPAT is a modelling language. It was developed in 1960. The SPAT's representation is the following -

- 1- A main box where the name of process or the action is specified.
- 2- On the left hand side of this box, incoming arrow that is input and output.
- 3- On the upper part, the incoming arrow - means used the action.
- 4- Authors or developer of SAPT models.
- 5- Comments who renew the author work.
- 6- Readers or users of SPAT models.
- 7- Expert, who can advise the author.
- 8- Technical committee or renewers of the SPAT models in details.



- 9- Project manager who governs the system analysis and design.
- 10- Monitor or chief analyst to assist SAST and developers and users.
- 11- Instructor to train SAST developers and user of the data models.

\* Object oriented methodologies of application development :- OOM is a system development approach encouraging the facility and reuse of software component. With this methodology a computer system can be developed on a component basis which enables the effective reuse of existing component and facilitates the sharing of its component by other system.

\* Document of OOM — These document provides a brief overview of the ~~com~~ OOM. It benefits the process and some of the major techniques used in OOM. These are following —

- 1- OOM procedures manual — This document describes the comm<sup>n</sup> process structures and procedures involved in conducting the commercial project.
  - 2- OOM documentation manual — This document define the deliverables for the project using the OOM. It describes the purpose content and preparation guidelines for each deliverables.
- Object oriented design techniques are



widely accepted due to following reasons -

- (i) Simplicity due to abstraction.
- (ii) Easily decomposed into sub-problem.
- (iii) Easily maintenance
- (iv) Reuse of code and design
- (v) Improvement in the productivity.

OOD is a group of methodologies that sees real world entities as objects and classes.

For example - hospital is the real entity.

### \* Steps of object oriented system development -

- 1- Define the use case model.
- 2- During the system analysis phase drawing UML syntax.
- 3- Counting in the analysis phase develop class diagram.
- 4- Still in the analysis draw state diagram.
- 5- Develop and document the system.
- 6- Begin system design by modifying the UML diagram

### • Characteristics of Object Oriented System :-

The basic characteristics of OOD are classes, object, method and message.

- 1- Dynamic binding refers to the ability of an object oriented system to differ the data types of object until run time.
- 2- Polymorphism means having the ability to take to take on the multiple form.

### • Key activities in an object oriented design process :-

There are five key activities in an object oriented design -



- Design the system architecture.
- Identify the principal objects
- Develop the design model
- Specify the triggers interface.

\* Data modelling :-

(Data modelling is the process of creating a data model for the data to be stored in the database.) This data model is a conceptual representation of data objects. The association between different data objects and their rules.

Data modelling helps in the visual representation of data and enforces the business rules regulatory companies and the government policies on the data. Data models ensure consistency and in naming conventions, default values and security while ensuring quality of data.

Data model emphasis on what data is needed and how it should be organised instead of what operations need to be performed on data. Data model is like architecture of building plan which help to build a conceptual model and set the relationship between the data item.

There are two types of data model -

- 1- Entity Relationship (E-R) model.
- 2- UML (Unified Modelling Language)

The primary goal of using data model are -

- (a) Ensure that all data objects required by the database are actually represented.



- (b) A data model helps design the database at the conceptual, physical and logical levels.
- (c) Data model structure helps to define the relation tables, primary and foreign key and stored procedure.
- (d) It provides a clear picture of the base data and can be used by the database developers to create a physical database.
- (e) It is also helpful to identify missing and redundant data.
- (f) Though the initial creation of the data model is labour and time consuming and it makes the IT infrastructure upgrade and maintenance cheaper and faster.

\* Process model :- Process models are processes of the same nature that classified together into a model. Then a process model is a description of process at the type level. The same process model is used repeatedly for development of a many applications and installation.

- Process modelling tools :- Techniques to model business process such as the flowchart, functional flow, block diagram, control flow diagram, PERT diagram has emerged since the beginning at the 20th century. Develop a model using a analogy, or abstract representation to describe a scientific principle to design solution, develop and used the model describe or predict the phenomena. Develop a diagram or simple physical prototype to convey a proposed



object tools or process.

• Advantage of Process Modelling :- There are hundred of different process model eg - waterfall, fix, spiral, rapid, prototyping model and agile model. All these above model have different characteristics with different software environment.

There are following key advantages of process model is -

1. Quality of conservation
2. Mutual understanding
3. Documentation
4. Transparency
5. Alignment of business processes with business and IT infrastructure.
6. Business process improvement and quality.
7. Standardization of best practices
8. Business system requirements
9. Rapid prototyping united process
10. Extreme language programming environment
11. Visual model are thing like flow chart, picture etc.

★ Use of computer aided VLSI engineering case tool :-  
 The software engineering case tools are used for developing high quality defision tree and maintainable software. Case software is often to associated with method for the development of the information system together with the automated tool, that can be used in the software development process.  
 (It is the domain of software tools used



to design and implement application. Case tools are similar to and were partially inspired by CAD tools for designing the hardware product.)

- 1- The case tools are support specific task in the SDLC.
- 2- It combine the two or more tools focused on a specific part of software life cycle.
- 3- Software environment combine two or more tools and support the complete software life cycle.
- 4- Business and analysis modelling, graphical modelling tools. Eg- E-R modelling.
- 5- Development, design and construction phase of the life cycle, debugging environment like JISE.
- 6- Verification and validation and construction phase of life cycle debugging environment.
- 7- Control the check-in and check-out of repository object.
- 8- Analysing the code for complexity, modularity and performance etc.
- 9- It manage the project plan, task assignment, scheduling.

Another common way to define case tools is user defined like upper case and lower case tools.

\* Implementation of Information System :-

System implementation is the process of defining how the information system should be build (physical system design) ensuring that the information system is operational and used, ensuring that the information system meets quality standard.



- Stages of implementation of Information System :-  
The system described in the guide include the following -

1. Exploration
2. Installation
3. Full implementation
4. Initial implementation
5. Expansion and scale up

Each stage has specific step and associated activities to produce a system that is easy to read, code and maintain the following -

1. Factoring decomposition
2. Span of control.
3. Reasonable size
4. Coupling - minimize the inter-module dependency
5. How the various program parts/module of an information system are physically organised.
6. How the modules communicate with each other through data couple (data exchange) and flag (control/message).
7. How the modules are related to each other in term of sequence selection and repetition.

- \* Connecting DFD to structure chart :- The following assumption are required for implementation of information system.

1. Locate the central transform/transaction center.
2. Find the co-ordinating module for the top of the chart.
3. Identify the primary input and output data flow.



- 4- Draw a top-level chart.
- 5- Refine the chart until the data origin, system function and output disposition are defined.

#### Management Info. System

★ Implementation of MIS :- The following points are required for the implementation of MIS -

- 1- Implementation plans - It is the series of action oriented step planned for making the implementation smooth.
- 2- Organising the MIS department.
- 3- Selection and procurement of hardware.
- 4- Creating the database.
- 5- Training of users.
- 6- Creating physical infrastructure
- 7- Transition of new system

Implementation is the process that turns strategies and plans into action in order to accomplish goals. The critical action move to strategic plans from a document that sits on the shelf to action that drive business grows.

Implementation is the carrying a unit, execution or practice of a plan, a method or any decision idea, model, specification standard or policy for doing something. Implementation is the action that must follow any in order for something to the actually happens.