Bharathidasan University

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SOFTWARE COST ESTIMATION

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SOFTWARE COST ESTIMATION

Software cost estimation is the process of predicting the effort required to develop a software system.

- Project scope must be established in advanced.
- Software metrics are used as a support from which evaluation is made.
- The project is broken into small PCs which are estimated individually.
- To achieve true cost & schedule estimate, several option arise.
- Delay estimation
- Used symbol decomposition techniques to generate project cost and schedule estimates.
- Acquire one or more automated estimation tools

COST FACTOR

- Cost factors represent a value modifier that is an additional function or component from a base cost to give a new unit cost.

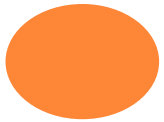
- Examples of cost factors include insurance, freight, material handling, and packaging.

COST ESTIMATION TECHNIQUES

- Cost estimation in project management is the process of forecasting the financial and other resources needed to complete a project within a defined scope.

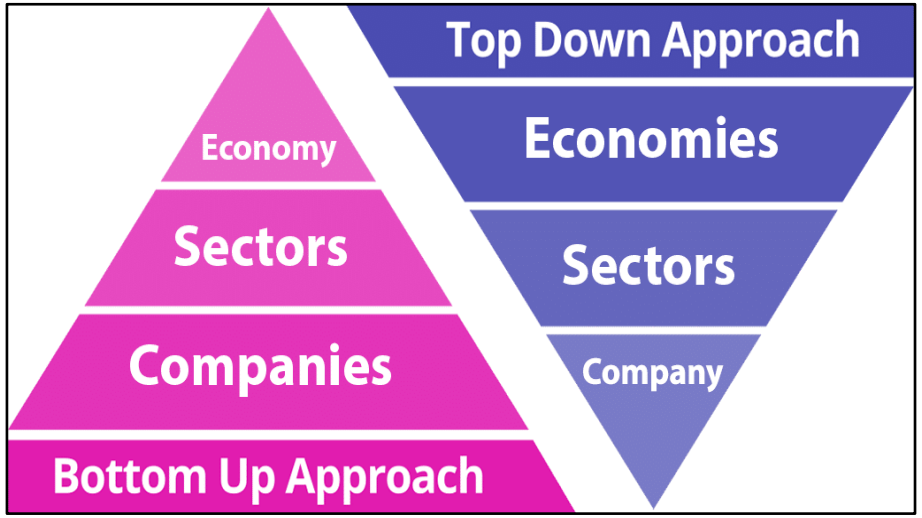
1. Top-down approach:

- It is a method of designing and building a system by starting with a high-level design and then progressively refining the design with increasing levels of detail.
- Thereafter, the product/project is divided into components belonging to lower levels.
- It is also known as the stepwise refinement approach or Macro Model.



2. Bottom-up Approach:

- Bottom-Up Model is a system design approach where the parts of a system are defined in details.
- Once these parts are designed and developed, then these parts or components are linked together to prepare a bigger component.
- This approach is repeated until the complete system is built.



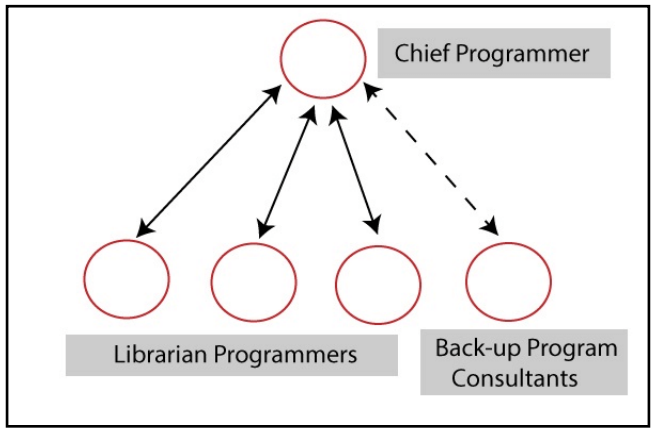
3. Expert Judgement

- Expert judgment is a technique in the project planning process that refers to making a judgment based on skill, expertise, or specialized knowledge in a particular area.

- The expertise can be based on an individual's training or educational background, career experience, or knowledge of the product/market.

STAFFING LEVEL ESTIMATION

- Staffing deals with the appoint personnel for the position that is identified by the organizational structure.
- It involves: Defining requirement for personnel. Recruiting (identifying, interviewing, and selecting candidates)



ESTIMATING SOFTWARE MAINTENANCE COSTS

- Software cost estimation is the process of predicting the effort required to develop a software system.

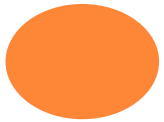
- Software maintenance typically require 40-60 percent of the total life cycle effort devoted to the software product.

- A widely used rule of thumb for the distribution of maintenance activities is

  60% - Enhancements

  20% - Adaption

  20%- Corrections



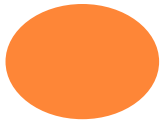
SOFTWARE REQUIREMENT

Definition:

- The software requirements are description of features and functionalities of the target system.

- Requirements convey the expectations of users from the software product.

- The requirements can be obvious or hidden, known or unknown, expected or unexpected from client's point of view.



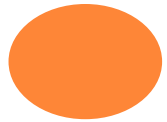
Types of Software Requirement

1. Functional Requirement

Functional requirements are such software requirements that are demanded explicitly as basic facilities of the system by the end-users.

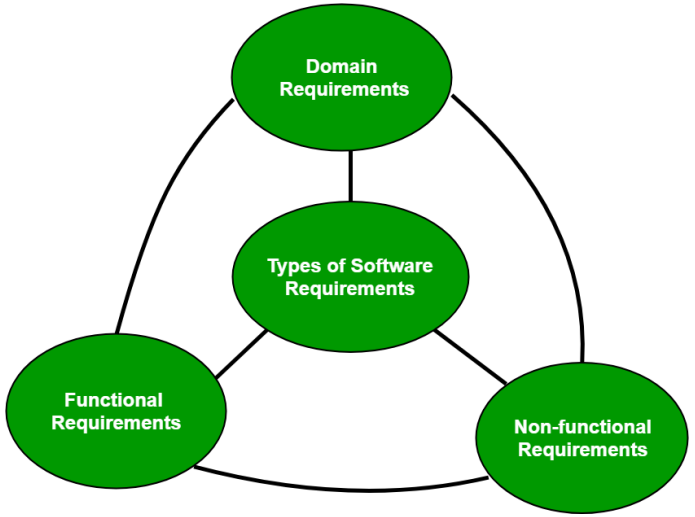
2. Non-Functional Requirement (NFR)

These requirements are defined as the quality constraints that the system must satisfy to complete the project contract



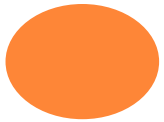
3. Domain Requirement

- Domain requirements are the requirements related to a particular category like software, purpose or industry, or other domain of projects



SOFTWARE REQUIREMENT SPECIFICATION (SRS)

- A software requirements specification (SRS) is a document that describes what the software will do and how it will be expected to perform.
- It also describes the functionality the product needs to fulfil the needs of all stakeholders (business, users).



Properties of SRS

1. Correct - User review is done to check that the requirements listed in the SRS are proper.

2. Unambiguous - if all requirements have only one interpretation.

3. Complete - The SRS is complete if it has the following components:

- All fundamental requirements
- Definition of the software's reactions
- Complete labeling and references

4. Consistent - The SRS is said to be consistent if no subset of the requirements has a conflict.

5. Verifiable

- Check whether the final software meets all requirements.
- The requirements are verified with the help of software reviews.

6. Traceable

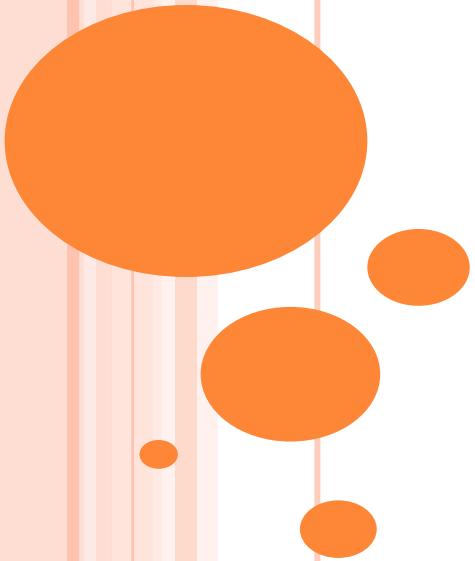
The SRS is traceable if the origin of each requirement is clear and if it facilitates the referencing of each condition in the future

9. Design Independent

The final system should include the option of selecting from numerous design possibilities.

10. Testable

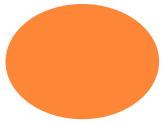
An SRS document should be constructed so that it is simple to build test cases and test plans.



FORMAL SPECIFICATION TECHNIQUE

FORMAL SPECIFICATION TECHNIQUE

- This technique is a mathematical method to specify a hardware or software system.
- It verifies whether a specification is realizable, and verifies that an implementation satisfies its specification.
- A formal specification language consists of two sets —syn and sem, and a relation sat between them.
  - The set syn called the syntactic domain.
  - The set sem called the semantic domain.
  - The relation sat called the satisfaction relation.



1. Syntactic domains

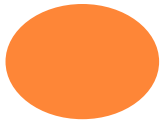
The syntactic domain of a formal specification language consists of an alphabet of symbols and a set of formation rules to construct well-formed formulas from the alphabet.

2. Semantic domains

Abstract data type specification languages used to specify algebras, theories, and programs.

3. Satisfaction relation

It is essential to determine whether an element of the semantic domain satisfies the specifications.



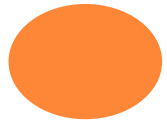
Specification Technique

1. Algebraic approach

- The system is specified in term of its operation and their relationship

2. Model- based Approach

- The system is specified in term of a state model that is constructed using mathematical constructs such as sets and sequences.



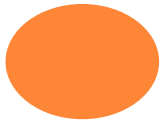
LANGUAGE IN FORMAL SPECIFICATION

1. Model Based Languages

- In it the specification is expressed as a system state model.
- This state model is constructed using well understood mathematical entities such as sets, relations, sequences and functions.

2.Algebraic Specification Languages

- Process algebras are amenable to algebraic manipulation; however, there are also languages which describe a system solely in terms of its algebraic properties.

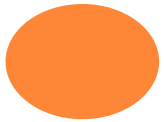


3. Process oriented Languages

- In these languages processes are denoted and built up by expressions and elementary expressions, respectively, which describe particularly simple processes.

4. Hybrid Languages

- Many systems are built with a combination of analog and digital components.
- In order to specify and verify such systems it is necessary to use a specification language that encompasses both discrete and continuous mathematics.



THANK YOU