Bharathidasan University

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Tiruchirappalli - 620024.

Programme Name	:	Bachelor of Computer Applications
Course Code	:	20UCA5CC7
Course Title	:	Software Engineering
Semester	:	V
Unit	:	Unit I
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INTRODUCTION

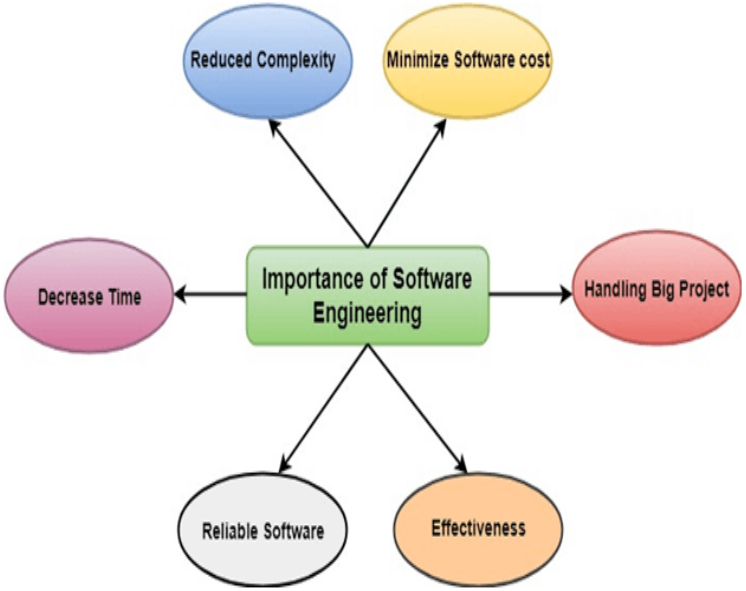
INTRODUCTION

- The term software engineering is the product of two words, software, and engineering.
- Software is a collection of programs.
- Software, when made for a specific requirement is called software product.

Definition:

- Software engineering is the establishment and use of sound engineering principles in order to obtain economically software that is reliable and work efficiently on real machines.

Importance of Software Engineering



QUALITY AND PRODUCTIVITY FACTORS

Some factor that affects Quality and Productivity factors are:

- Individual ability
- Team communication
- Product complexity
- Appropriate notations
- Systematic Approach
- Controlling Change
- Level of Technology
- Required Reliabilty
- Available Time
- Problem understanding.

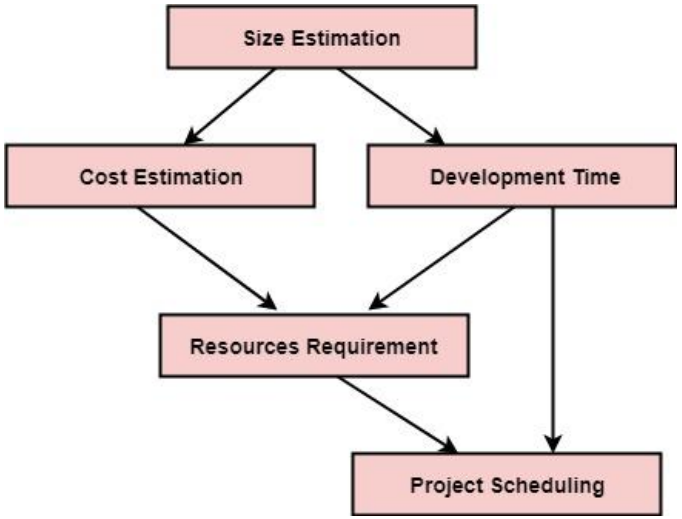
MANAGERIAL ISSUES

- Methods for Cost estimation techniques
- Methods for Resource allocation policies
- Methods for budgetary Control
- Methods to manage project milestones or sprints
- Methods to setup maintain and continuously evolve a suitable release or project schedule
- Methods for effective communication between team members and customers
- Methods to develop and sustain effective contractual agreements with customers so that legal and contractual terms are observed.

PLANNING AND DEVELOPMENT

PLANING A SOFTWARE PROJECT

A Software Project is the complete methodology of programming advancement from requirement gathering to testing and support, completed by the execution procedures, in a specified period to achieve intended software product.



Defining the Problem

(i) Identifying the problem

- Needs of the client
- A need is an instance in which a necessity or want exists
- Solution needs to meet the requirements of these needs
- Functionality Requirements
- Describe what the system will do & what the solution needs to achieve
- The requirements of the system give direction to the project

(ii). Compatibility Issues

- Software of various types runs on a variety of environments
- When designing software developers must ensure products are able to be used on multiple devices and conditions
- Examples include:

    Problems with different operating systems versions

    Browsers that do not implement HTML standards

    Hardware not supporting software

(iii). Performance Issues

- Testing and real world applications are very different
- Testing must be extremely rigorous and broad

PLANNING AND DEVELOPMENT PROCESS

Planning a Project

- Project planning is a discipline addressing how to complete a project in a certain timeframe, usually with defined stages and designated resources.
- One view of project planning divides the activity into these steps:
  - setting measurable objectives
  - identifying deliverables
  - scheduling
  - planning tasks

Development Process

- The Software Development Process is the structured approach to developing software for a system or project, sometimes called the Software Development Life Cycle (SDLC).

The Software Development Process include 5 major steps:

1. Planning and Analysis

- The client describes a problem that needs to be addressed, which serves as the foundation for completing the rest of the software requirements.

2. Designing

- The software and system design is developed according to the instructions provided in the 'Requirement Specification' document.

3. Developing and Implementation

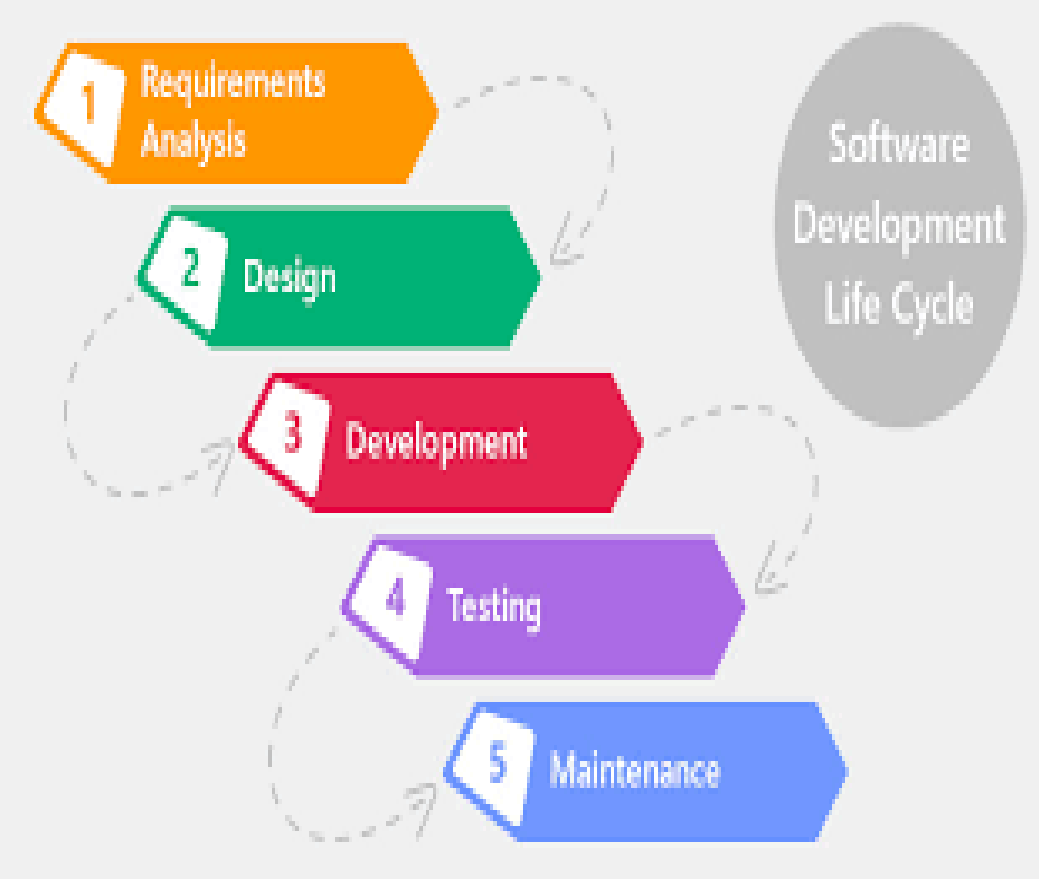
- In this stage, the actual coding is done and the code is produced based on the design specifications.
- This is the most critical and also the longest stage in the SDLC.

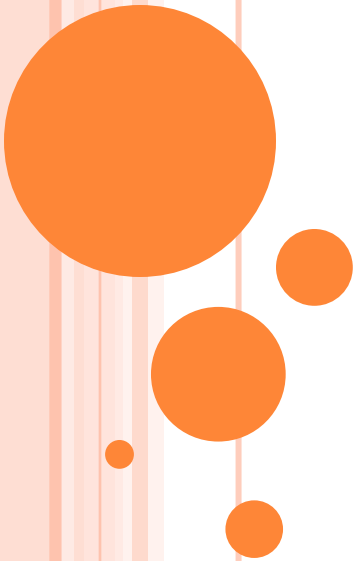
4. Testing

- After the development of the code, it is tested to see if it meets all the requirements that were determined in the first stage.
- Various kinds of testing such as system testing, unit testing, acceptance testing, and integration testing are carried out.

5. Deployment and Maintenance

- This is the final stage, where the finished software is delivered to the customer.
- The real problems are identified once the customer begins use.

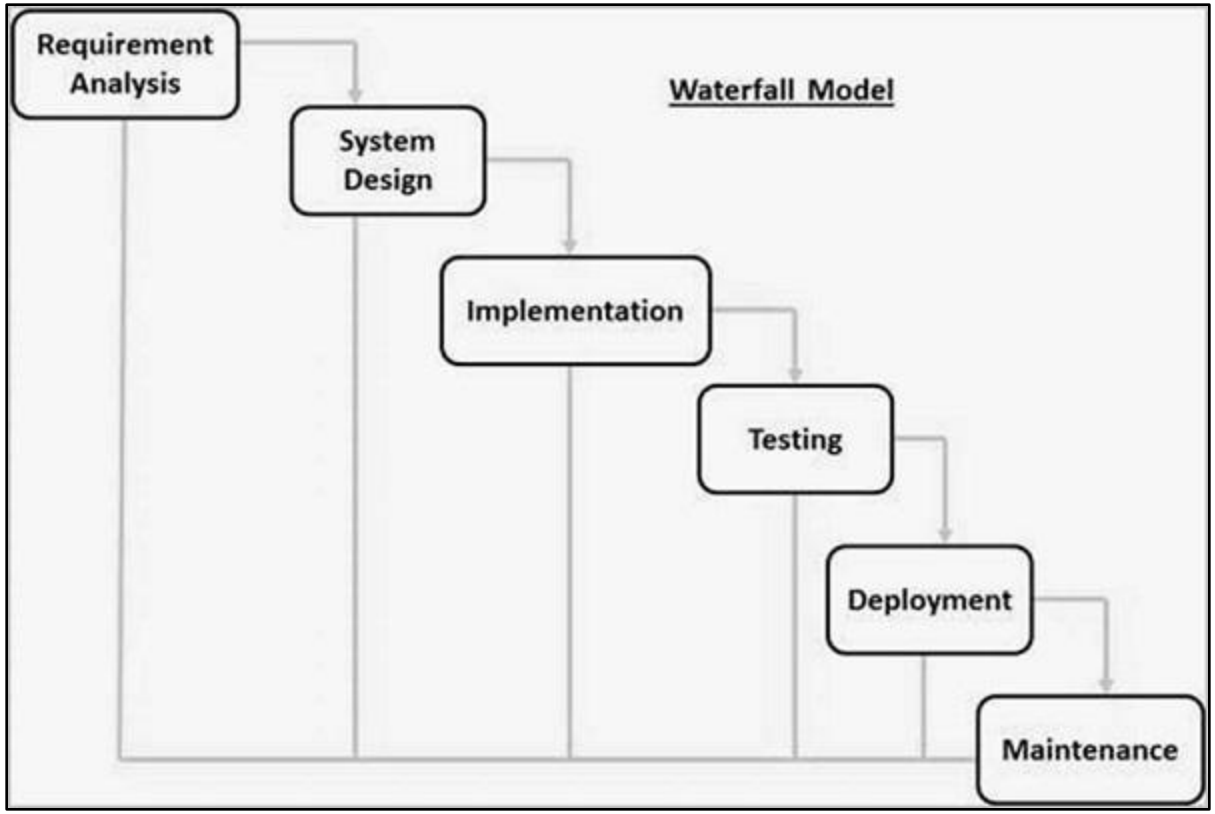

1
Requirements Analysis
2
Design
3
Development
4
Testing
5
Maintenance
Software Development Life Cycle



Models

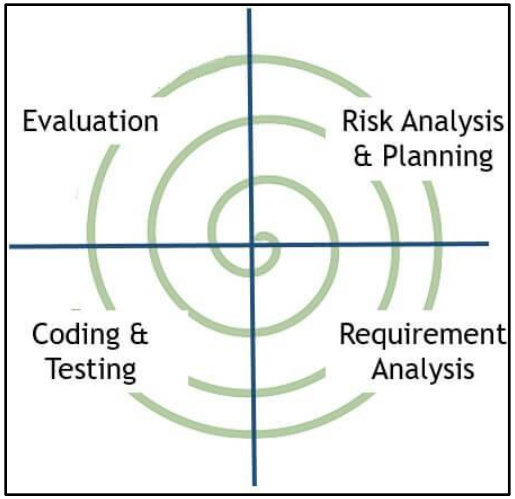
1. Waterfall Model

- The Waterfall is a universally accepted SDLC model.
- In this method, the whole process of software development is divided into various phases.
- The waterfall model is a continuous software development model in which development is seen as flowing steadily downwards (like a waterfall) through the steps of requirements analysis, design, implementation, testing (validation), integration, and maintenance.
- The developer must complete every phase before the next phase begins. This model is named "Waterfall Model".


Requirement Analysis
System Design
Implementation
Testing
Deployment
Maintenance
Waterfall Model

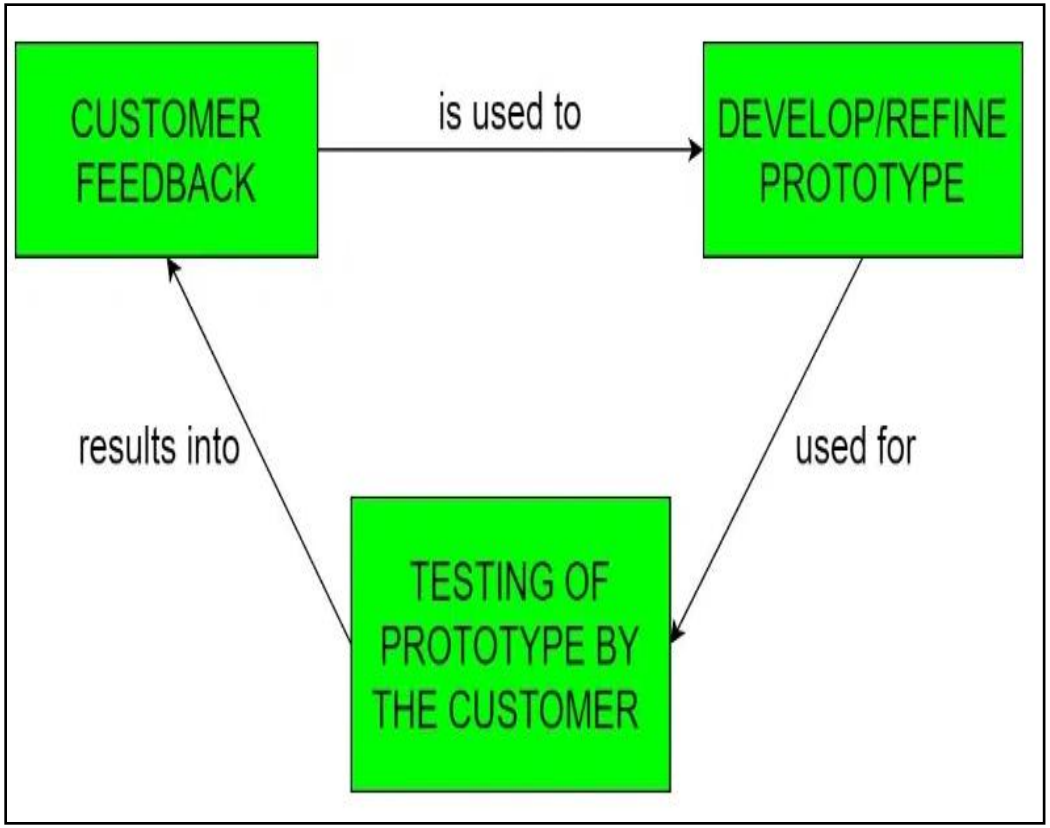
2. The Spiral Model

- This model has four phases dividing the model into quadrants: planning, risk analysis, engineering, and evaluation.
- The number of loops in the spiral depends on the specific project and the project manager's discretion.
- On average, software development takes 6 months with this model.



3. Prototype Model

- Prototyping is defined as the process of developing a working replication of a product or system that has to be engineered.
- This model is used when the customers do not know the exact project requirements beforehand
- In this model, a prototype of the end product is first developed, tested, and refined as per customer feedback repeatedly till a final acceptable prototype is achieved which forms the basis for developing the final product


CUSTOMER FEEDBACK
is used to
DEVELOP/REFINE PROTOTYPE
results into
used for
TESTING OF PROTOTYPE BY THE CUSTOMER

ORGANIZATIONAL STRUCTURE

ORGANIZATIONAL STRUCTURE

- The organizational structure of an organization tells you the character of an organization and the values it believes in.

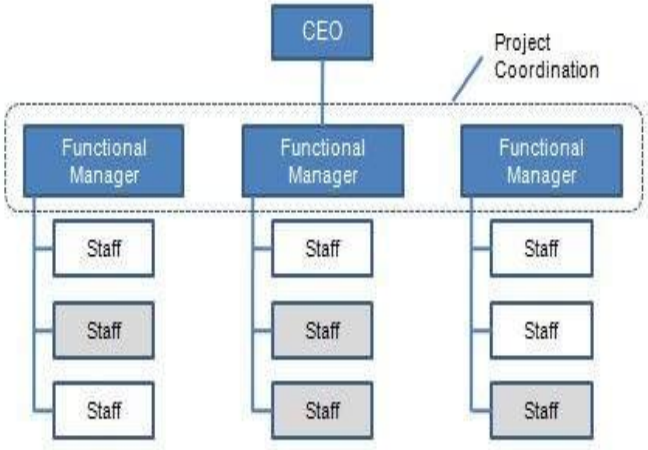
Types of Organizational Structure

1. Bureaucratic Structures

- Bureaucratic structures maintain strict hierarchies when it comes to people management.

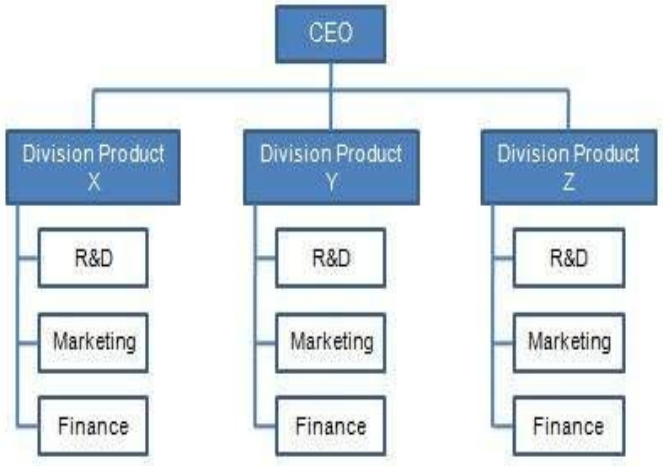
2. Functional Structure

- The organization is divided into segments based on the functions when managing.
- This allows the organization to enhance the efficiencies of these functional groups.



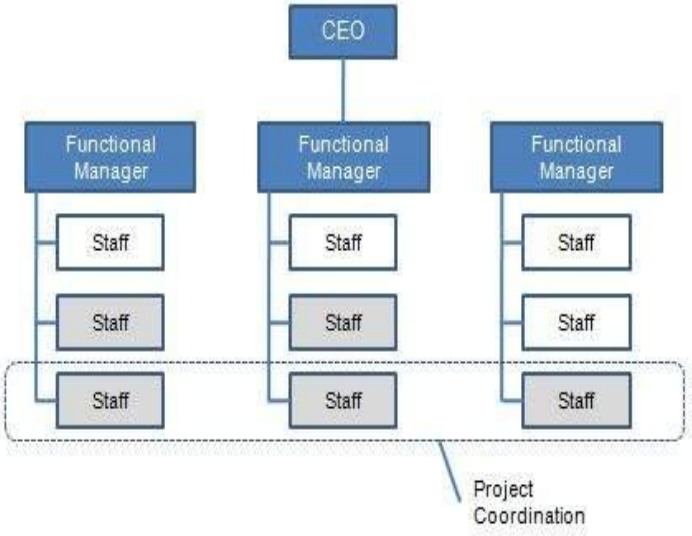
3. Divisional Structure

- These types of organizations divide the functional areas of the organization to divisions.
- Each division is equipped with its own resources in order to function independently.



4. Matrix Structure

- The organization places the employees based on the function and the product.



OTHER PLANNING ACTIVITIES

The list of activities are as follows:

- Project planning and Tracking
- Project Resource Management
- Scope Management
- Estimation Management
- Project Risk Management
- Scheduling Management
- Project Communication Management
- Configuration Management

THANK YOU