

INTRODUCTION

SOFTWARE DEVELOPMENT

OBJECTIVE

- ✖ Software Development Using object oriented approach
- ✖ Software development approaches
 - + Structured approach
 - + Object oriented approach

SDLC MODEL

A framework that describes the activities performed at each stage of a software development project. It covers the detailed plan for building, deploying and maintaining the software.

BENEFITS OF SDLC

- ✖ It offers a basis for project planning, scheduling, and estimating
- ✖ Provides a framework for a standard set of activities and deliverables
- ✖ It is a mechanism for project tracking and control
- ✖ Increases visibility of project planning to all involved stakeholders of the development process
- ✖ Increased and enhance development speed
- ✖ Improved client relations
- ✖ Helps you to decrease project risk and project management plan overhead

SDLC PHASES

- ✖ Planning
 - + Problem definition
 - + Preliminary Investigation/Feasibility study
- ✖ Requirement gathering and analysis
- ✖ Design
- ✖ Implementation
 - + coding
 - + Testing
 - + User Training
 - + Documentation
 - + Deployment
- ✖ Maintenance

PLANNING

- ✖ Evaluate the terms of the project. This includes calculating labor and material costs, creating a timetable with target goals, and creating the project's teams and leadership structure. Planning should clearly define the scope and purpose of the application.

PLANNING ACTIVITIES

- ✖ Identify the problem – Reasons behind need for automation
- ✖ Preliminary investigation – gather facts about the System/organization. Fact finding techniques – Interviewing, Questionnaires, Observation, Document reading/analysis, Research
- ✖ Feasibility study

FEASIBILITY STUDY

- ✖ This is a research conducted to assess the viability of the project.
- ✖ The objective of the feasibility study
 - + is to establish the reasons for developing the software
 - + To analyze whether the software will meet organizational requirements.
 - + To determine whether the software can be implemented using the current technology and within the specified budget and schedule.

TYPES OF FEASIBILITY STUDIES

- ✖ Economic: Can we complete the project within the budget or not?
- ✖ Legal: Can we handle this project as cyber law and other regulatory framework/compliances.
- ✖ Operation feasibility: Can we create operations which is expected by the client?
- ✖ Technical: Need to check whether the current technology in terms of H/w and S/W can support the development
- ✖ Schedule: Decide that the project can be completed within the given schedule or not.

TYPES OF FEASIBILITY

- ✖ Social – Impact of the software on employees lives
- ✖ Environmental

REQUIREMENT GATHERING AND ANALYSIS

- ✖ During this phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only.
- ✖ The purpose of the Requirements Analysis Phase is to transform the needs and high-level requirements specified in earlier phases into unambiguous (measurable and testable), traceable, complete, consistent, and stakeholder-approved requirements

SYSTEM DESIGN

- ✖ In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.

System design involves the following main activities

- ❖ Architectural design: This defines the relationship of the major structural components of the system. It involves identifying the different components and how they are related with one another.
- ❖ Data Structure design : This transform the information domain model created during analysis into data structure that would be required to implement the software – the data structure refers to the form that data takes and the manner in which this data is stored and access.
- ❖ Procedural design :This transforms the structural component design into procedural description of the software. They can be shown using pseudo code, flow chart , decision tables in the structural development paradigms etc.

- ❖ Component design : This tries to allocate services in a different components of the system – involve the design of individual modules. Procedural design may be part of component design.
- ❖ Interface design :Users and module communicate with each other therefore, this requires interface design to show the messages will be handled between the different components – Human computer interaction is an element of interface design. Generally interface design include, dialogue design, form design, report design etc.

BOEHM'S FIRST LAW

Errors are most frequent during requirements and design activities and are more expensive the later they are removed.

IMPLEMENTATION

- ✖ The process of putting the system in place. System implementation activities include
 - + Coding – Writing Programs
 - + Testing – verify and validate the software
 - + Software changeover strategy – Direct, parallel, Phased, Pilot
 - + User Training
 - + Software Documentation
 - + Deployment

MAINTENANCE

- ✖ The Maintenance Phase occurs once the system is operational. It includes implementation of changes that software might undergo. Types of maintenance
 - + Corrective maintenance
 - + Perfective maintenance
 - + Adaptive maintenance
 - + Preventive maintenance

SOFTWARE QUALITY FACTORS

McCall's Factor Model Classifies all software requirement into 11 software quality factors, grouped into three categories :

1. Product operation factors : Correctness, Reliability, Efficiency, Integrity, Usability.
2. Product revision factors : Maintainability, Flexibility, Testability.
3. Product transition factors : Portability, Reusability, Interoperability.

PRODUCT OPERATION

It includes five software quality factors, which are related with the requirements that directly affect the operation of the software such as operational performance, convenience, ease of usage and its correctness. These factors help in providing a better user experience.

- ❖ Correctness –
The extent to which a software meets its requirements specification.

- ❖ Efficiency – The amount of hardware resources and code the software, needs to perform a function.
- ❖ Integrity – The extent to which the software can control an unauthorized person from the accessing the data or software.
- ❖ Reliability – The extent to which a software performs its intended functions without failure.
- ❖ Usability – The extent of effort required to learn, operate and understand the functions of the software.

PRODUCT REVISION :

It includes three software quality factors, which are required for testing and maintenance of the software. They provide ease of maintenance, flexibility and testing effort to support the software to be functional according to the needs and requirements of the user in the future.

❖ Maintainability – The effort required to detect and correct an error during maintenance phase.

❖ Flexibility – The effort needed to improve an operational software program.

❖ Testability – The effort required to verify a software to ensure that it meets the specified requirements.

PRODUCT TRANSITION :

It includes three software quality factors, that allows the software to adapt to the change of environments in the new platform or technology from the previous.

- ❖ Portability – The effort required to transfer a program from one platform to another.
- ❖ Re-usability – The extent to which the program's code can be reused in other applications.
- ❖ Interoperability – The effort required to integrate two systems with one another.

THE END