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SDLC

(Software Development Life Cycle)

It typically includes the phases like **Planning,Design,Coding,Testing,Development,and Maintanance**

It outlines the stages involved in creating software applications,ensuring efficiency,quality,project is developed in a methodological way that meets the required standards and quality

Phases:

Planning

System Design

Implementation

Testing

Deployment

Maintanance

Planning:

Objective:

Define the purpose and scope of the Software.Identity Goals,Resources,Timelines,and the Budget.

To understand the user needs and define the software functional and non-functional requirement.

Involves discussions with stackholder(eg.,Client,and End users,Product managers).

The output is typically a software Requirements Specification (SRS)document that outlines the requirements in detail.

Identifes contraints,security needs,performance and scalability expections.

System Design:

Objective :

Design the software architecture and create detailed system Specification

This DDS is assessed by market analysts and stakeholders

High Level Design:

Architectur,modules,data flow,and interface design.

it involves desicions about the software structure,including the choice of technology stack(eg., Front-end,backend,database),communication protocals,and how different modules will interact

Data Flow Diagram(DFD):

Theses diagrams depríct the flow of data within the system,including input and output.

It shows how data is processes through the System,highlighting key processes,data stores,and data interactions.

System components:Identifies the major components or modules of the system,their responsibilities,and how they interact with each other.

Low-level Design (LLD):

Detailed design for each module,database design,algorithms,and data structures.

The input to LLD is HLD i.e. LLD translates the HLD into smaller and more specific details.

LLD, or Low-Level Design, is a phase in the software development process where detailed system components and their interactions are specified.

It involves converting the high-level design into a more detailed blueprint, addressing specific algorithms, data structures, and interfaces.

LLD serves as a guide for developers during coding, which ensures the accurate and efficient implementation of the system's functionality.

Implementation:

(Coding/Development):

Objective:

Convert design documentation into actual code.

Developers write the code in the chosen programming language.

Collaboration with other teams(eg.,Database,UI/UX) for Integration.

Version control Systems are used to manage the code Changes.

Testing:

Testing is conducted following the development phase as a way of ensuring the system's quality.

Objective:

Unit Testing

Integration Testing

System Testing

Unit Testing:

Testing individual components.

A "unit" is the smallest testable part of an application,typically a single function or method within a class

Developers write test cases before or during the development of the Code.

By testing Individual components early,defects can be identified and fixed immediately,whicjh is cheaper and easier than discovering them in later stages

Unit test help detects bugs early in the development process,thus minimizing the risk of defects in later stages

Integration Testing:

Ensuring that different modules work Together.

Verify the correction interaction between integrated modules or components.

Ensure that invidual modules,work together as a coherent system

Integeration testing and before system testing in the SDLC

System Testing:

Validating the entire system.System testing is typically conducted in an environment that mirrors the production environment as closely as possible.

This includes identical hardware,software,network configurations,and database.

A detailed test plan is created to specified what aspect of the system need to be tested and how the tests should be executed.

Test case are designed to cover different aspects of the system,including edge cases,error handling,and negative scenarios

Deployment:

Objective :

Release the software for use by the target people.

Deployment on production servers or distribution to end users.

Configurations and fine-tuning of the system for optimal performance.

Maintanance :

Objective:

Keep the software updated and address any issues that arise after deployment.

Bug fixes and patches.

Periodic updates and new features releases

Performance monitoring and optimization

Addressing changing user requirements or external system changes.