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SE ZG501
Software Quality Assurance and Testing
Lecture No. 9

Test Driven Development

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Test-Driven Development (TDD) is a software development methodology where tests are

written **before** writing the actual code. It follows a structured process:

1. **Write a test**: Create a test case based on the requirements.
2. **Run the test**: The test will fail since the actual code doesn't exist yet.
3. **Write the minimal code**: Develop only the necessary code to pass the test.
4. **Run the test again**: Ensure the test now passes.
5. **Refactor the code**: Optimize the code while keeping it functional.

V Model

The V-Model, as depicted in the diagram, represents a software development lifecycle model emphasizing a structured and sequential development and testing process. **It is called the "V- Model" because of its V-shaped structure**, where the left side represents the **verification** phase (developer's lifecycle), and the right side represents the **validation phase (tester's lifecycle). The center of the "V" is the coding phase**, which bridges the two halves.

Here's a detailed explanation of each stage in the diagram:

Verification Phase (Left Side of the V)

This phase focuses on planning, designing, and verifying that the product is being built correctly according to requirements.

1. **Business Requirement Specification (BRS)**
   - Description: Defines the **high-level business goals and user needs.** ○ Output: **A business requirement document (BRD).**
   - Corresponding Test Activity: **Acceptance Testing**.
2. **System Requirement Specification (SRS)**
   - Description: Elaborates on **detailed functional and non-functional requirements**.

V Model

- Output: **A system requirement specification document.**
- Corresponding Test Activity: System Integration Testing.

3. **High-Level Design (HLD)**
   - Description: Describes the **architecture and design of the system, breaking down modules and their interactions.**
   - Output: High-level design documents.
   - Corresponding Test Activity: Component Testing.

4. **Low-Level Design (LLD)**
   - Description: Focuses **on detailed designs for each module or component.**
   - Output: Low-level design documents.
   - Corresponding Test Activity: **Unit Testing**.

5. **Coding**
   - Description: The actual development of the software system, converting designs into executable code.

V Model

This phase involves testing to ensure the product meets the business and technical requirements.

1. **Unit Testing**
   - **Tests individual components or modules as defined in the LLD**. ○ Ensures each unit functions as intended.
2. **Component Testing**
   - Verifies the **integration and interaction between multiple components.** ○ Ensures data flow between modules works as expected.
3. **System Integration Testing**
   - Validates **the overall system's functionality** against the **system requirements**. ○ Ensures the system works in an integrated environment.
4. **Acceptance Testing**
   - Confirms that the **final product meets the business requirements (BRS).**
   - Often performed by the client or end-users.

ITIL Framework

The **ITIL framework** outlines a structured approach to IT service management, divided into five key stages:

1. **Service Strategy:** This stage **focuses on defining the organization's approach to delivering services, ensuring they align with business objectives and customer needs**.
2. **Service Design:** In this phase, **detailed plans and specifications are developed to create new services or modify existing ones**, ensuring they are fit for purpose and meet quality requirements.
3. **Service Transition:** This stage **manages the implementation of new or changed services into the live environmen**t, ensuring they are delivered e@ectively and without disruption.
4. **Service Operation:** This phase involves the ongoing management and delivery of services to users, ensuring they operate e@iciently and meet agreed-upon service levels.
5. **Continual Service Improvement:** Throughout all stages, this phase focuses on identifying and implementing improvements to enhance service quality and align with evolving business needs.

THANK YOU