Software Testing Methodologies

Levels of Testing

Agenda

- Dynamic Testing (Validation)
- Levels of dynamic testing
- Unit testing
- Integration testing & their types
- System testing
- Acceptance testing & their types

Dynamic Testing (Validation)

Testing that involves the execution of the software of a component or system

Levels of Dynamic Testing (Validation):

- Unit Testing
- Integration Testing
- System Testing
- Acceptance Testing

Methods of Dynamic Testing (Validation):

- White box testing
- Black box testing

Unit Testing

Unit Testing:

- It is the testing of individual software components.

- Unit Testing involves glass box testing of code conducted by the programmer that has written the code. Unit testing is primarily a debugging activity that concentrates on the removal of coding mistakes. It is part and parcel with the coding activity itself.

- It is the most 'micro' scale of testing; to test particular functions or code modules. Typically done by the programmer and not by testers.

Unit Integration Testing:

- Testing performed to expose defects in the interfaces and interaction between integrated components.

Integration Testing

Integration Testing:

- Testing performed to expose defects in the interfaces and in the interactions between integrated components or systems

- Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with interfacing. The objective is to take unit tested components and build a program structure that has been dictated by design

System Integration Testing:

- Testing the integration of systems and packages; testing interfaces to external organizations.

Integration Testing

Types of Integration Testing:

- **Big-bang testing:** A type of integration testing in which software elements, hardware elements, or both are combined all at once into a component or an overall system, rather than in stages.

- **Bottom-up testing:** An incremental approach to integration testing where the lowest level components are tested first, and then used to facilitate the testing of higher level components. This process is repeated until the component at the top of the hierarchy is tested.

- **Top-down testing:** An incremental approach to integration testing where the component at the top of the component hierarchy is tested first, with lower level components being simulated by stubs. Tested components are then used to test lower level components. The process is repeated until the lowest level components have been tested

Acceptance Testing

Acceptance Testing:

- Formal testing with respect to user needs, requirements, and business processes conducted to determine whether or not a system satisfies the acceptance criteria and to enable the user, customers or other authorized entity to determine whether or not to accept the system.

- The primary objective of acceptance testing is to get the acceptance from the client. Client will be using the system against the business requirements.

- User testing is primarily intended to demonstrate that the software complies with its requirements

Acceptance Testing

Types of Acceptance Testing:

- **Alpha Testing:** Simulated or actual operational testing by potential users/customers or an independent test team at the developers' site, but outside the development organization. Alpha testing is often employed for off-the-shelf software as a form of internal acceptance testing

- **Beta Testing:** Operational testing by potential and/or existing users/customers at an external site not otherwise involved with the developers, to determine whether or not a component or system satisfies the user/customer needs and fits within the business processes. Beta testing is often employed as a form of external acceptance testing for off-the-shelf software in order to acquire feedback from the market.

Thankyou!