**Unit 33 Application Development Using Project Management Methods**

3. Evaluate development tools and frameworks

33.3.4 I can explain the effectiveness of tests and reflect on their purpose

I can explain the effectiveness of testing in software development. As there is no method is 100 % effective. But testing is very important during the development of software applications . A primary purpose of testing is to detect software failures so that defects may be discovered and corrected. Testing cannot establish that a product functions properly under all conditions, but only that it does not function properly under specific conditions. The scope of software testing may include the examination of code as well as the execution of that code in various environments and conditions as well as examining the aspects of code: does it do what it is supposed to do and do what it needs to do. In the current culture of software development, a testing organization may be separate from the development team. There are various roles for testing team members. Information derived from software testing may be used to correct the process by which software is developed It saves time and large costs .

**Various types of testing**

* **Unit testing -**In the V-Model, Unit Test Plans (UTPs) are developed during module design phase. These UTPs are executed to eliminate bugs at code level or unit level. A unit is the smallest entity which can independently exist, e.g a program module. Unit testing verifies that the smallest entity can function correctly when isolated from the rest of the codes/units.

**Manual testing -** Manual testing is a software testing process in which test cases are executed manually without using any automated tool. All test cases executed by the tester manually according to the end user's perspective. It ensures whether the application is working, as mentioned in the requirement document or not. Test cases are planned and implemented to complete almost 100 percent of the software application. Test case reports are also generated manually.Manual Testing is one of the most fundamental testing processes as it can find both visible and hidden defects of the software. The difference between expected output and output, given by the software, is defined as a defect. The developer fixed the defects and handed it to the tester for retesting.Manual testing is mandatory for every newly developed software before automated testing. This testing requires great efforts and time, but it gives the surety of bug-free software. Manual Testing requires knowledge of manual testing techniques but not of any automated testing tool.

* **Integration testing-**Integration Test Plans are developed during the Architectural Design Phase. These tests verify that units created and tested independently can coexist and communicate among themselves. Test results are shared with customer's team.
* **System testing-**System Tests Plans are developed during System Design Phase. Unlike Unit and Integration Test Plans, System Test Plans are composed by client's business team. System Test ensures that expectations from application developed are met. The whole application is tested for its functionality, interdependency and communication. System Testing verifies that functional and non-functional requirements have been met. Load and performance testing, stress testing, [regression testing](https://en.wikipedia.org/wiki/Regression_testing), etc., are subsets of system testing.
* **User acceptance testing-**User Acceptance Test (UAT) Plans are developed during the Requirements Analysis phase. Test Plans are composed by business users. UAT is performed in a user environment that resembles the production environment, using realistic data. UAT verifies that delivered system meets user's requirement and system is ready for use in real time.