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Date: 05/24/2018

Article 1: System Testing: What? Why? & How?

According to this article, the definition of system testing is “the testing of a complete and fully integrated software product.” All the modules of this system have been integrated, and this system is ready to be treated as one product to test. Generally, this system has been tested through white-box testing, such as unit testing and integration testing, and it is prepared for entering black-box testing. The differences between white-box and black-box testing are that white-box testing focuses on the internal structures and mechanism of this system, whereas black-box testing concentrates on the external scenarios and behaviors of the system. The test cases of black-box testing are derived from software requirement specification (SRS) documents, software design, and users’ expectations.

There are many reasons why system testing is important. The first reason is that system testing is the first time that testers can test the system as a whole. Before system testing, this system is only tested by single units or classes and by combined units or classes. The second reason is that system testing will evaluate the whole system according to the requirement documents, which will show how far this system can satisfy users’ expectations. Moreover, system testing can validate this system and make sure that this system can meet the required application architecture and business requirements. The final reason is that this system can be tested in a specific environment that is similar to the real production. If the system cannot perform well in system testing, there is no way to proceed with production smoothly.

As to different hierarchical levels of testing, these testing activities from the bottom to the top are unit testing, integration testing, system testing, and acceptance testing, and the corresponding testing objectives of these levels are coding, design, requirements, and customers’ needs. Every level of testing has a different purpose. Consequently, any technical processes cannot omit any of these tests because these tests verify the product in different aspects.

Regarding the entry criteria for system testing, firstly, unit testing must be completed because this demonstrates that the coding of this system is verified and approved. Next, individual units or classes must be fully integrated without critical issues. If critical issues still exist, continue fixing them. Later, this system should be completely developed in accordance with the SRS documents. Finally, this system should reach a qualified degree that makes it eligible to be tested for system testing. For example, a phone product should be able to restart 100 times without system panic, and then this system is allowed to enter system testing.

There are many approaches to execute system testing. A system testing plan has to be determined according to goals, testing strategies, requirements, responsibilities, etc. Consequently, test cases need to be generated, and test data are also required. At the system testing stage, automated tests should be included. During the execution of system testing, test cases might be updated due to the introduction of new management tools. In the meanwhile, bug reports must also be generated regularly. Finally, system testing is not only performed one time. If the test result is bad, system testing should be repeated until this system passes the test plan and test cases.