***System Testing:***

Once Integration testing is completed successfully, we move on to the next level of testing, which is called ***System testing***. IEEE defines the system tests as ***“A testing performed on a complete and integrated system to check the system’s compliance with its specific requirements”*.** System testing can be classified as :

* ***Functional System testing:*** *This ensures that the system is performing all the functions that were specified in the software requirement specification. E.g. On an Amazon website, a user should be able to search a product, add to cart, and finally place an order using a debit/credit card.*
* ***Non-Functional System testing:*** *This ensures that the non-functional aspects of the system are working to acceptable standards. E.g. On an amazon website, the search results should be shown to the user within 3 seconds. The cart page should not crash on a simultaneous user load of 50k users. Some of the types of Non-functional requirements are :*
  + ***Performance*** *– System performs to industry standards.*
  + ***Load Handling*** *– Performance of system under increased load*
  + ***Recovery*** *– How the system recovers on failures. E.g. What happens when Payment gateway goes down.*
  + ***Reliability*** *– Ability of software to repeatedly perform its function consistently with time.*
  + ***Usability*** *– Ease with which a user can perform desired functions*

Some of the considerations for System testing are as follows :

* *System testing is done from a user perspective while component testing and integration testing is done from a technical perspective.*
* *System testing is often performed in a dedicated environment that is close to production in terms of hardware and software configurations.*
* *Stubs and mock services are not used in System testing.*
* *System testing usually takes more time than Component and Integration testing.*

***Acceptance Testing:***

Acceptance testing is performed after System testing is successfully executed. Acceptance testing is done to provide the end-users the confidence that the system will work according to their expectations. While all the other levels (*Component, Integration, and System*) are executed by the software producers, acceptance testing is the only level that is carried out by the customers and end-users. The amount of acceptance testing required depends on product risk, and also how much testing has been successfully executed in previous levels.

Acceptance testing could be of various types, some of the key ones are listed below.

* ***Contract Acceptance Testing:*** *In some of the projects, the criteria for accepting a product is predefined, and documented as a contract. The acceptance testing is carried out to check if the software complies with the documented criteria. E.g. A train ticket booking software could have acceptance criteria that it should support simultaneous bookings of up to 1000 users per minute. So simply ensuring that the software can book the ticket will not result in the acceptance of software. The software has to prove that it can take up a minimum of 1000 bookings per minute without any performance degradation.*
* ***Regulation Acceptance Testing:*** *The software must meet regulatory standards of different countries and industries before it is released to production. E.g. US, UK has strict laws that a website should adhere to accessibility standards.*
* ***User Acceptance Testing:*** *This testing is mainly carried out by end-users. There could be different user groups who will use the software, and we need to ensure that each group is represented in UAT. E.g. A ticket booking system will be used by customers, agents, and admins. All these groups will have a different perspective of how the software should work for them, so it’s essential to include all of them in UAT*
* ***Operational Acceptance Testing:*** *Operational testing ensures that software is ready to be used and maintained in a live environment. Typical checks can include Back-up facilities, training for end-users, Disaster recovery plans, etc.*
* ***Alpha Testing:*** *Alpha testing is usually carried out by the internal staff of the software development company. It’s done when the software is at the verge of completion, and it’s done at the developer’s site. The team could include an independent testing team.*
* ***Beta Testing:*** *Beta testing is done by a group of customers. It is done at the customer’s site and usually performed after Alpha testing has been completed successfully.*