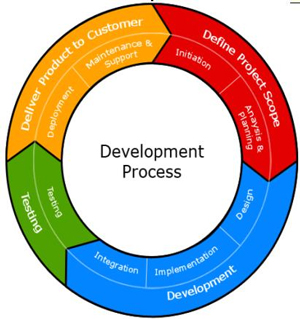
**Software Development Life Cycle (SDLC)**

“You’ve got to be very careful if you don’t know where you’re going, because you might not get there.”

**SDLC MODEL**

A framework that describes the activities performed each stage of a software development project.

* Planning
* Requirement gathering
* Design
* Development
* Integration and test
* Deployment and maintenance



There are different types of software methodologies used in software industry.

Just to name few;

1. Agile
2. Waterfall
3. V-Shaped
4. Spiral…etc.

As a chemist starting software testing job we do not need to understand or know all of them but at least we should have some knowledge of it. At Agilent Technologies, Inc. we are using the agile model.

In agile model there are several approaches but the one which is being used here in our project is Scrum.

Just to give an idea about ‘Scrum’ since we all know being from science background we are always so curious to know more in-depth of things. I would like to give a brief introduction on scrum approach of Agile.

Scrum is an iterative, incremental framework for a project management and agile software development.

Scrum is a process skeleton which contains sets of practices and predefined roles. The main roles in Scrum are,

* The “Scrum Master”, who maintains the processes (typically in lieu of a project manager)
* The “Product Owner”, who represents the stakeholders and the business
* The “Team”, a cross-functional group of people who do the actual analysis, design, implementation, testing etc.

During each sprint, typically a two to four week period, the team creates a potentially shippable product increment. The set of features that go into a sprint come from the product backlog, “which is prioritized set” of high level requirements of work to be done.

**ARTIFACTS**

**Product Backlog**: The product back log is a high-level document for the entire project. It contains the backlog items, broad decryptions of all required features, wish-list items, etc. prioritized by business value. It is the “What” that will be built.

**Sprint Backlog**:The sprint backlog is a document containing information about how the team is going to implement the features for the upcoming sprint. Features are broken down into tasks; as a best practice, tasks are normally estimated between four and sixteen hours of work.

**Burn Down**: Burn down chart is the publically displayed chart showing remaining work in the sprint backlog. Updated every day, it gives a simple view of the sprint progress. It also provides quick visualizations for reference.

**PRODUCT OWNER**

* Holds the vision for the product
* Defines the feature for the product
* Maintains a prioritized backlog for the product
* Decides on release date and content
* Is responsible for the ROI (return on investment) of the product
* Can change features and priorities every sprint
* Accepts or reject work result

**SCRUM MASTER**

* Ensures that the process is followed
* Ensures that the team is fully functional and productive
* Hosts the daily scrum, iterations review and planning meetings
* Remove impediments
* Shields the team from external interferences.

**SCRUM TEAM**

* Cross-functional, Team 7 +/-2 members
* Has the right to do everything within the boundaries of the project guidelines to reach the Sprint objectives
* Organize itself and its work
* Provides estimates for releases and sprints
* Updates sprint estimates on daily basis
* Commits to the Sprint goal and specifies work results
* Demos work results to the product owner

So finally what is Agile about? Agile is about putting something meaningful in front of business/customer quickly in an efficient and better way.

As a software QA our job is the same as lab QA which means the quality of the whole product. So as a software QA our job is to check the software is bug free and is doing what it meant to do as per the requirements.

Testing is a process of technical investigations that is intended to reveal quality-related information about the product with respect to the context in which it is intended to operate.

Quality software is reasonably bug-free, delivered on time, meets requirements and/or expectations, and is maintainable.

To start as a software QA we need to have some basic knowledge of different type of testing.

There are different types of testing.

1. **Black box testing**-not based on any knowledge of internal design or code, tests are based on requirements and functionality.
2. **Grey box testing**-Grey box testing refers to the technique of testing a system with limited knowledge of the internals of the system.
3. **White box testing**-based on knowledge of the internal logic of an application code.
4. **Unit Testing**-the most micro scale of testing; to test the particular functions or code module. This is done by the developers.
5. **Smoke Test**-typically an initial testing effort to determine if a new software version is performing well enough to accept it for major testing effort.
6. **Functional Testing**-black box type testing geared to functional requirements of an application, this type of testing is done by testers
7. **System Testing**-testing conducted on a complete, integrated system to evaluate the systems, compliance with its specified requirements, similar to black box testing.
8. **Regression testing**-re-testing after fixes or modifications of the software or its environment.
9. **Load/Stress/Performance testing**-testing an application under heavy loads, such as a testing of a website under range of loads to determine at what point the system’s response time degrades or fails.
10. **Acceptance testing**-allows the end-user or customer to decide whether or not to accept the product.
11. **Alpha testing**- testing by potential users/customers on an independent test team at the developers’ site. It’s the internal acceptance testing, before the software goes to beta testing.
12. **Beta testing**- released to a limited audience outside of the company. Software is released to group of people so that further testing can ensure the product has few faults or bugs. Sometime available to open public to increase the feedback.

**Test Case**

A test case is a document, which has a set of test data, preconditions, expected results and post conditions, developed for a particular test scenario in order to verify compliance against a specific requirement.

**BUG/DEFECT**

“A computer bug is an error, flaw, mistake, failure, or fault in a computer program that prevents it from working correctly or produces an incorrect result. Bugs arise from mistakes and errors, made by people, in either a program’s source code or its design.”

**Classification of Defects/ Bugs**

There are various ways in which we can classify defects. Below are some of the classifications:

**Severity Wise:**

**1. Critical:** A defect receives a “critical” severity level if one or more critical system functionalities are impaired by a defect with is impaired and there is no workaround.

**2. High:** A defect receives a “high” severity level if some fundamental system functionalities are impaired but a workaround exists.

**3. Medium:** A defect receives a “medium” severity level if no critical functionality is impaired and a workaround exists for the defect.

**4. Low:** A defect receives a “low” severity level if the problem involves a cosmetic feature of the system.

Like software development life cycle, bug also have a life cycle, which is called bug life cycle.

**Bug status description:**

**This is somehow varies company to company and kind of tool company is using to manage the bug life cycle but overall concept is the same.**

**1. New:** When QA files new bug.

**2. Deferred:** If the bug is not related to current build or cannot be fixed in this release or bug is not important to fix immediately then the project manager can set the bug status as deferred.

**3. Assigned:** ‘Assigned to’ field is set by project lead or manager and assigns bug to developer.

**4. Resolved/Fixed:** When developer makes necessary code changes and verifies the changes then he/she can make bug status as ‘Fixed’ and the bug is passed to testing team.

**5.** **Duplicate:** if the bug is reaped then bug status is changed to DUPLICATE.

**6. Could not reproduce:** If developer is not able to reproduce the bug by the steps given in bug report by QA then developer can mark the bug as ‘CNR’. QA needs action to check if bug is reproduced and can assign to developer with detailed reproducing steps.

**7. Need more information:** If developer is not clear about the bug reproduce steps provided by QA to reproduce the bug, then he/she can mark it as “need more information’. In this case QA needs to add detailed reproducing steps and assign bug back to developer for fix.

**8. Reopen:** If QA is not satisfied with the fix and if bug is still reproducible even after fix then QA can mark it as ‘Reopen’ so that developer can take appropriate action.

**9. Closed:**If bug is verified by the QA team and if the fix is ok and problem is solved then QA can mark bug as ‘Closed’.

**10. Rejected/Invalid:** Sometimes developer or team lead can mark the bug as Rejected or invalid if the system is working according to specifications and bug is just due to some misinterpretation.