QUALITY ASSURANCE DOCUMENTATION

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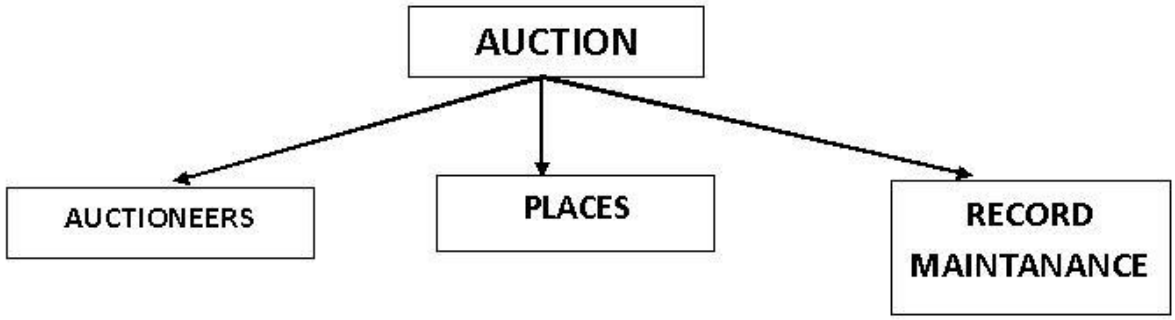
Software quality assurance (SQA) is a process that assures that all software engineering processes, methods, activities, and work items are monitored and comply with the defined standards. These defined standards could be one or a combination of any like ISO 9000, CMMI model, ISO15504, etc.
SQA incorporates all software development processes starting from defining requirements to coding until release. Its prime goal is to ensure quality.

QA Activities: -

1) QA Management Plan:
The foremost activity includes laying down a proper plan regarding how the QA will be carried out in your project. Here the plan.

Task Name	Duration	Planned Started	Planned Finished
Analysis	1 day	04-07-2022	04-07-2022
Design	1 day	05-07-2022	05-07-2022
Development	1 day	06-07-2022	06-07-2022
Testing	1 day	07-07-2022	07-07-2022

2) Apply software Engineering Techniques:
Applying some software engineering techniques aids by a high-quality specification. For gathering information, a designer may use techniques such as interviews and FAST (Functional Analysis System Technique).



4) Executing Formal Technical Reviews:

In this process, a meeting is conducted with the technical staff to discuss the actual quality requirements of the software and the design quality of the prototype. This activity helps in detecting errors in the early phase of SDLC and reduces rework effort in the later phases.

5) Having a Multi-Testing Strategy:

By multi-testing strategy, we mean that one should not rely on any single testing approach, here we approach to use multiple testing method for our project that should be Unit testing, Functional testing and also Integration testing

6) Controlling Change:
In this activity, we use a mix of manual procedures and automated tools to have a mechanism for change control.

By validating the change requests, evaluating the nature of change, and controlling the change effect, it is ensured that the software quality is maintained during the development and maintenance phases.

7) Measure Change Impact:
Here, we should determine the impact of the change which is brought by the defect fix. They need to test not only if the change has fixed the defect, but also if the change is compatible with the whole project.

For this purpose, we use software quality metrics that allow developers to observe the activities and proposed changes from the beginning till the end of SDLC and initiate corrective action wherever required.

8) Maintaining Records and Reports:

It is crucial to keep the necessary documentation related to quality team and share the required quality assurance information with the stakeholders. The test results, audit results, review reports, change requests documentation, etc. should be kept for future reference.

Quality Assurance Standards:

Here we follow some popular standards that's are:

ISO 9000: This standard is based on seven quality management principles which help the organizations to ensure that their products or services are aligned with the customer needs.

Principles of ISO 9000 are depicted here:

CMM level:
CMM stands for **Capability maturity model.** This model originated in software engineering. It can be employed here to direct process improvement throughout a project, department, or entire organization.

An organization is appraised and awarded a maturity level rating (1-5) based on the type of appraisal.

QA Techniques:

There are several techniques for QA. Auditing is the chief technique that is widely adopted. However, we have a few other significant techniques as well.

Various QA Techniques include:

- **Auditing:** Auditing involves inspection of the work products and its related information to determine if the set of standard processes were followed or not.
- **Reviewing**: A meeting in which the software product is examined by both the internal and external stakeholders to seek their comments and approval.
- **Code Inspection:** It is the most formal kind of review that does static testing to find bugs and avoid defect growth in the later stages. It is done by our tester The reviewer should not be the author of the code.
- **Design Inspection:** Design inspection is done using a checklist that inspects the below areas of software design:
    - General requirements and design
    - Functional and Interface specifications
    - Conventions
    - Requirement traceability
    - Structures and interfaces
    - Logic
    - Performance
    - Error handling and recovery
    - Testability, extensibility
    - Coupling and cohesion
    -
- **Functional Testing:** Using this QA technique we verifies what the system does without considering how it does it. This type of widely rang of black box testing mainly focuses on testing the system specifications or features.
- **Standardization:** Standardization plays a crucial role here. It decreases the ambiguity and guesswork, thus ensuring quality.
- **Static Analysis:** It is a software analysis that is done by an automated tool without actually executing the program. This technique is highly used for quality assurance for auction system software. Software metrics and reverse engineering are some popular forms of static analysis.
- **Walkthroughs:** A software walkthrough or code walkthrough is a kind of peer review where the developer guides the members of the development team to go through the product and raise queries, suggest alternatives, and make comments regarding possible errors, standard violations, or any other issues.
- **Path Testing:** It is a white box testing technique where the complete branch coverage is ensured by executing each independent path at least once.
- **Stress Testing:** This type of testing is done to check how robust a system is by testing it under heavy load i.e. beyond normal conditions.
- **Six Sigma:** Six Sigma is a quality assurance approach that aims at nearly perfect products or services. So, we use here for purpose that main objective of six sigma is process improvement so that the produced software is 99.76 % defect-free.