

Quality:

Software quality product is defined in term of its fitness of purpose. That is, a quality product does precisely what the users want it to do. For software products, the fitness of use is generally explained in terms of satisfaction of the requirements(SRS ,BRS).

Example: Consider a functionally correct software product. That is, it performs all tasks as specified in the SRS document. But, has an almost unusable user interface. Even though it may be functionally right, we cannot consider it to be a quality product.

What is Quality Assurance?

Assurance is nothing but a positive declaration on a product or service. It provides a guarantee that the product will work without any problems as per the expectations or requirements.

Mostly related with the process and checking that client expectation is meeting properly or not.

Note-Refer SQA notes as well.

What is QC?

Quality control popularly abbreviated as QC.

It is a Software Engineering process used to ensure quality in a product or a service.

It examines the quality of the "end products" and the final outcome.

The main aim of Quality control is to check whether the products meet the specifications and requirements of the customer.

If an issue or problem or bug is identified, it needs to be fixed before delivery to the customer.

Difference between Quality Control and Quality Assurance?

Sometimes, QC is confused with the QA. Quality control is to examine the product or service and check for the result.

Quality Assurance in Software Engineering is to examine the processes and make changes to the processes which led to the end-product.

Quality Assurance (QA)	Quality Control (QC)
It focuses on providing assurance that quality requested will be achieved.	It focuses on fulfilling the quality requested.
It is the technique of managing quality.	It is the technique to verify quality.
It does not include the execution of the program.	It always includes the execution of the program.
It is a managerial tool.	It is a corrective tool.
It is process oriented.	It is product oriented.
The aim of quality assurance is to prevent the defects.	The aim of quality control is to identify and improve the defects.
It is a preventive technique.	It is a corrective technique.
It is responsible for full software development life cycle.	It is responsible for software testing life cycle.
Example: Verification	Example: Validation

QA Complete Process

Quality Assurance methodology has a defined cycle called PDCA cycle or Deming cycle.

The phases of this cycle are:

- Plan
- Do
- Check
- Act



Let's look into the above QA Process steps in detail -

- Plan - Organization should plan and establish the process related objectives and determine the processes that are required to deliver a high-Quality end product.
- Do - Development and testing of Processes and also "do" changes in the processes
- Check - Monitoring of processes, modify the processes, and check whether it meets the defined objectives or not.
- Act - A Quality Assurance tester should implement actions that are necessary to achieve improvements in the processes

An organization must use Quality Assurance to ensure that the product is designed and implemented with correct procedures.

This helps reduce problems and errors, in the final product.

Quality Assurance Certifications:

There are several certifications available in the industry to ensure that Organizations follow Standards Quality Processes. Customers make this as qualifying criteria while selecting a software vendor.

ISO 9000

CMMI level

CMMI level

The Capability Maturity Model Integrated (CMMI) is a process improvement approach developed specially for software process improvement.

This model is widely used in Software Development Organizations.

CMMI has 5 levels.

An organization is certified at CMMI level 1 to 5 based on the maturity of their Quality Assurance Mechanisms.

- Level 1 - Initial: In this stage the quality environment is unstable. Simply, no processes have been followed or documented
- Level 2 - Repeatable: Some processes are followed which are repeatable. This level ensures processes are followed at the project level.
- Level 3 - Defined: Set of processes are defined and documented at the organizational level. Those defined processes are subject to some degree of improvement.
- Level 4 - Managed: This level uses process metrics and effectively controls the processes that are followed.

- Level 5 - Optimizing: This level focuses on the continuous improvements of the processes through learning & innovation.