Software Quality

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Software Quality – Definition

Software Quality - IEEE definition

Software quality is:

1. The degree to which a system, component, or process meets specified requirements.

2. The degree to which a system, component, or process meets customer or user needs or expectations.

Two Alternative definitions of software quality, held by the founders of modern quality assurance, **Philip B. Crosby and Joseph M. Juran**.

■ "Quality means conformance to requirements" *(Crosby, 1979)*.

■ "(1) Quality consists of those product features which meet the needs ofcustomers and thereby provide product satisfaction.

(2) Quality consists of freedom from deficiencies" *(Juran, 1988)*.

Software Quality – Definition

Software Quality – Pressman's Definition

Software quality is defined as:

Conformance to explicitly stated functional and performance requirements, explicitly documented development standards, and implicit characteristics that are expected of all professionally developed software.

Software Quality Assurance - Definition

Software Quality Assurance - IEEE Definition

Software quality assurance is:

1. A planned and systematic pattern of all actions necessary to provide adequate confidence that an item or product conforms to established technical requirements.

2. A set of activities designed to evaluate the process by which the products are developed or manufactured. Contrast with quality control.

Software Quality Assurance - Definition

This definition may be characterized in the following:

■ *Plan and implement systematically*. SQA is based on planning and the application of a variety of actions that are integrated into all the stages of the software development process. This is done in order to substantiate the client's confidence that the software product will meet all the technical requirements.

■ Refer to the *software development process*.

■ Refer to the specifications of the *technical requirements*.

Software Quality Assurance - Definition

SQA - Expanded Definition

Software quality assurance is:

A systematic, planned set of actions necessary to provide adequate confidence that the software development process or the maintenance process of a software system product conforms to established functional technical requirements as well as with the managerial requirements of keeping the schedule and operating within the budgetary confines.

Software Quality Assurance - Definition

The main deviations from the IEEE definition are:

■ SQA *should not be limited to the development process*. Instead, it should be extended to cover the long years of service subsequent to product delivery.

■ SQA actions *should not be limited to the technical aspects* of the functional requirements, but should include also activities that deal with scheduling and the budget

Software Quality Assurance vs. Software Quality Control

Quality Control

It is defined as "*a set of activities designed to evaluate the quality of a developed or manufactured product*"; in other words, activities whose main objective is the *withholding of any product that does not qualify*. Accordingly, quality control inspection and other activities take place as the development or manufacturing of the product is completed yet before the product is shipped to the client.

Quality Assurance

The main objective of quality assurance is to *minimize the cost* of guaranteeing quality by a variety of activities performed throughout the development and manufacturing processes/stages. These activities *prevent the causes of errors*, and detect and correct them early in the development process. As a result, quality assurance activities substantially *reduce the rate* of products that do not qualify for shipment and, at the same time, *reduce the costs of guaranteeing quality* in most cases.

The Objectives of SQA Activities

Software Development *(Process-Oriented)*

1. Assuring an acceptable level of confidence that the software will conform to functional technical requirements.

2. Assuring an acceptable level of confidence that the software will conform to managerial scheduling and budgetary requirements.

3. Initiating and managing of activities for the improvement and greater efficiency of software development and SQA activities. This involves improving the prospects of achieving the functional and managerial requirements while reducing the costs of carrying out the software development and SQA activities.

The Objectives of SQA Activities

Software Maintenance *(Product-Oriented)*

1. Assuring with an acceptable level of confidence that the software maintenance activities will conform to the functional technical requirements.

2. Assuring with an acceptable level of confidence that the software maintenance activities will conform to managerial scheduling and budgetary requirements.

3. Initiating and managing activities to improve and increase the efficiency of software maintenance and SQA activities. This involves improving the prospects of achieving functional and managerial requirements while reducing costs.

Summary

Software Quality Definitions?

SQA Definitions?

Objectives of SQA