

NEW APPROACH TOWARDS ENSURING SOFTWARE QUALITY

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ABSTRACT

The software quality maintenance is becoming a crucial task in the software development. The Quality control process includes various activities which are carried out during development to ensure the effectiveness of software that is produced at the end of development cycle. It is necessary to measure the software Quality for reasons like errors, failures, risks, high cost. This paper provides a brief introduction about software quality management, SQA, software quality control plan.

Keywords- Quality control plan, software quality assurance, software quality control, Software quality management

I. Introduction

Software quality specifies how well it complies with a given design, specifications, and requirements. It reflects an attribute based on fitness for purpose of a software product. Software quality indicates whether its software structure is able to meet its end user requirements along with its maintainability, correctness, robustness.

II. Software quality management

The software quality management is the process of managing the effectiveness of software. The aim of the software quality management is to manage the quality of software and its software process. It assures the product that fulfills the user needs. The quality of software is dependent upon five characteristics- Reliability, Efficiency, Security, Maintainability and (adequate) Size. Therefore, an object oriented model contributes to a better understanding for these notions.

Fig. below shows a software product, which is to fulfill requirements in having appropriate characteristics. The existence of relationships between requirements and characteristics makes statements about the quality of a product possible.

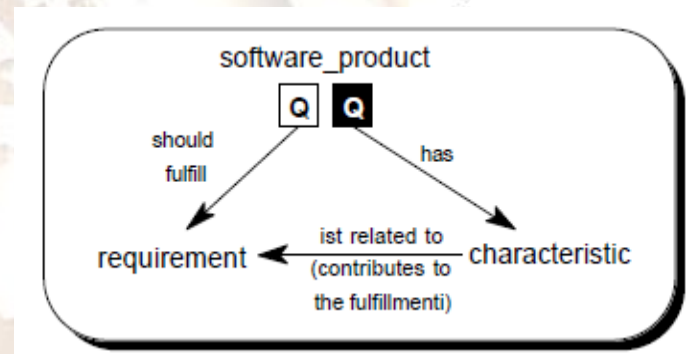


Fig-relationship between requirements and characteristics in conjunction with quality

The software quality management is collection of various activities. These activities define the process of managing and controlling the software quality. They include-software quality assurance, SQP(plan) and SQC(control).

The software quality assurance is define as the process in which the quality of software is assured by applying various means, by execution of knowledge, standards, rules to verify the product during its development cycle. The SQP defines some plans which are undertaken to achieve some good goals at the end of development.It includes how tools, policies, procedures are applied to achieve the expected goals and overcome risk and risk management.

The SQC is the measure for controlling and maintaining the quality of software being developed. It ensures that the SQA and SQP are strictly followed by each one of the project developers. It includes how to conduct standard process such as quality review, Verify and evaluate to improve the use of methods, procedures and adopted software tools.

SQM Roles

- To ensure that the required level of quality is achieved in a software product.
- To encourage a company-wide "Quality Culture" where quality is viewed as everyone's responsibility.
- To reduce the learning curve and help with continuity in case team members change positions within the organization.
- To enable in-process fault avoidance and fault prevention through proper development

Many people use the terms SQM and SQA (Software quality assurance) interchangeably.

III. Software quality assurance

Software Quality Assurance is a set of activities designed to evaluate the process by which the products are developed or manufactured. The main objectives of SQA are it assures acceptable levels of confidence, conformance to functional technical requirements. The SQA assures some standard steps and then follows these steps to evaluate the software product. These QA groups would not take any part in the manufacture process itself but would measure and audit the process to make sure the established guidelines and standards where being followed. SQA encompasses the entire software development process, which includes processes such as requirements definition, software design, coding, source code control, code reviews, change management, configuration management, testing, release management, and product integration. SQA is organized into goals, commitments, abilities, activities, measurements, and verifications. The QA group would then give input (metrics or measures) into a process of continuous improvement. It's not enough that software quality is important, some other points needs to be remembered regarding it and these are (1) explicitly define what is meant when you say 'software quality', (2) create a set of activities that will help ensure that every software engineering work product exhibits high quality, (3) perform quality assurance activities on every software project, (4) use metrics to develop strategies

for improving your software process, and as a consequence, improving the quality of the end product.

IV. Software quality control

Software Quality Control is the set of procedures used by organizations to ensure that a software product will meet its quality goals at the best value to the customer, and to continually improve the organization's ability to produce software products in the future. Software quality control refers to specified functional requirements as well as non-functional requirements such as supportability, performance and usability. It is distinct from software quality assurance which includes audits of the quality management system against a standard. Whereas software quality control is a control of products, software quality assurance is a control of processes.

Quality Control Plan: The project quality defines the steps followed to fulfill the requirements such that the end product meets its specification and quality of product is maintained. The plan for quality control should be clear, consistent, not detailed, understandable, unambiguous, and correct. The quality control plan consists of various parts that are defined as-

- Quality of control staff-it may include the no. of members in a team, experienced /inexperienced staff, and project manager.
- Quality of review-the review is done by the experienced project member who is not in the team.
- Quality of procedures undertaken –it deals with checking of reports, drawings, calculations.
- Dispute handling
- Documentation and Responses.

V. Conclusion

The purpose of Quality Control Plan is to assure that the quality of the product being developed is maintained throughout the development process. The Plan also includes the procedures which assist in controlling the quality of the product. The basic requirement of Quality Control is to fulfill all the valid requirements of the project. It also requires the developer to ensure that all the project activities are co-ordinated and completed as per schedule and reviews are made periodically. Although some

evidences show how SQA and SQC are subjected to improve a SDLC process but still only a few clear patterns can be seen. This is because SQC is only involved in Verification and Validation while SQA helps in continuous process improvements. These differences between them lead to objectivity and impartiality. The SQA/SQC both can be used only at small scale but not for large scale practice.

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