

Title of Paper

Quality is Conformance to Requirements

Presenter

Renate Stücka, Telelogic (D)

Instructional Level

Introductory Intermediate Advanced

Target Group

Product managers, project managers, development managers, quality managers

Keywords

- Software Quality Management
 - Compliance to quality standards
 - System Quality
-

Abstract

According to a popular definition the quality of a system or software product is sufficient and acceptable if all requirements are met. By gathering and documenting all requirements and by steering the development process along these requirements a high quality result can be achieved. However, if the set of requirements is incomplete the quality of deliverables will be poor. Often attention is paid to functional requirements only, ignoring the fact that these do not represent more than just a subset of the expectations to be met by the project deliverables. Further essential requirements include quality models reflecting various standards, safety relevant criteria, restrictions resulting from production or logistics and more depending on the particular project.

The sum of requirements describes the profile of the system under development. As requirements reflect a multitude of needs, characteristics, features and functions, many groups of stakeholders need to be involved in requirements elicitation, analysis and specification. In addition to the development organization other contributors can be quality assurance, sales, marketing, manufacturing, and customers.

An individual requirement is a mandatory system characteristic. It must be possible to get to a distinct statement if a particular requirement is fulfilled: a verification procedure must exist for each requirement resulting in two possible responses "true" or "false". The entire set of requirements known and specified at a point in time form the requirements model of the target system. A solution needs to fulfill either all requirements or an acceptable subset. It is not relevant if an individual requirement is fulfilled - however, failure to fulfill an essential requirement can lead to disaster, e.g. in a safety-critical aircraft system.

On any level of abstraction a subset of requirements describes a consistent model. For example, the set of user requirements defines how the system will behave on a functional level, and the set of quality requirements specifies in detail which quality standards and criteria must be met by the system under development.

Linking corresponding requirements through the abstraction layers provides for tracking requirements through the entire development lifecycle. As the project progresses, coverage of requirements can be monitored and the different levels of abstraction and implementation consistently map each other. A high level quality requirement, e.g. specifying an acceptable MTBF (Mean Time Between Failure), can be pursued through all levels of refinement, down to implementation and test cases to verify that this requirement is met. The system requirements correspond to the user requirements, and the design meets the system requirements. Traceability links are used to indicate the relationships between information structures and modules in different layers.

During the test phase the requirements represent the reference profile to which all functional and non-functional system/product characteristics must adhere. For each individual test level, such as module test, integration test, system test or acceptance test a corresponding subset of requirements needs to be verified. The end-to-end traceability links – requirement, design, implementation, and test – ensure that the project deliverables truly reflect the entire scope of requirements and therefore meet the quality objectives without any restrictions.

Biography

Renate Stuecka is Director of Field Marketing, EMEA, at Telelogic. Previous positions at Telelogic include responsibility for business development, partners and alliances, PR and communication, positioning and development of new opportunities. Mrs. Stuecka joined Telelogic in November 2000, bringing to the company more than 15 years of experience in marketing, sales and development of high-tech products in the software and communications industry. Mrs. Stuecka has a university degree in Computer Science from the University of Dortmund, Germany.

Contact information of Presenter

Renate Stücka
Telelogic Deutschland GmbH
Otto-Brenner-Straße 247, 33604 Bielefeld, Deutschland
renate.stuecka@telelogic.com ,
fon +49 (521) 14 503 254, fax +49 (521) 14 503 50
