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Quality, what does it mean?

Quality seems to imply different things, what do we mean when we say it is a quality product? This question even get more interesting if we compare industries to each other. Clearly a medical product has a higher level of quality than any game. And if so, what exactly do we mean or not mean by “a higher level of quality”?

Quality definitions

Before starting testing activities, e.g., defining the test strategy and test approach, there must be consensus about what quality really means in a specific business context. The objectives of the project in terms of quality must be clear. Otherwise what are we aiming for? Only then can wrong expectations, unclear promises and misunderstandings be avoided. Garvin showed that in practice generally five distinct definitions for quality can be recognized [Garvin]. I will describe these definitions briefly from the perspective of testing based on earlier publication [Trienekens and Van Veenendaal].

The product based definition

Quality is based on a well-defined set of software quality attributes. These attributes must be measured in an objective and quantitative way. Differences in the quality of products of the same type can be traced back to the way the specific attributes, e.g., reliability, performance, maintainability, have been implemented. This highly related to what is often called non-functional testing. Discuss with stakeholders which attributes are of importance and need to be tested. Often the existence of the attributes makes the difference.

The user based definition

Quality is fitness for use. This definition says that software quality should be determined by the user(s) of a product in a specific business situation. Different business characteristics require different “qualities” of a software product. Quality can have many subjective aspects and cannot be determined on the basis of only

quantitative and mathematical metrics. This is related to the validation process. It is related to testing with use cases, end-users, beta testing etc.

The manufacturing based definition

This definition points to the manufacturing, i.e. the specification, design and construction, processes of software products. Quality depends on the extent to which requirements have been implemented in a software product in conformance with the original requirements. Quality is based on inspection, using formal test design techniques and (statistical) analysis of defects and failures in (intermediate) products. Is testing is definition is covered by verification, e.g., using formal test design techniques such as decision tables and classification tree method, and applying traceability from test design to requirements.

The value based definition

This definition states that software quality should always be determined by means of a decision process on trade-off's between time, effort and cost aspects. The value based definition emphasis the need to make trade-off's, this in often done by means of communication with all parties involved, e.g. sponsors, customers, developers and producers. This quality definition relates to risk-based testing and the good enough paradigm. How much testing is enough? Which product risks must be mitigated etc.

The transcendent definition

This "esoteric" definition states that quality can in principle be recognized easily depending on the perceptions and the affective feelings of an individual or group of individuals towards a type of software product. Although the least operational one, this definition should not be neglected in practice. Often a transcendent statement about quality can be a first step towards the explicit definition and measurement of quality. I have always found this one very difficult to use in testing, but perhaps to some extent is related to the games industry. Why is a game appealing to my sons, I sometimes just do not understand: the transcendent definition?

Using the definitions....

The existence of the various quality definitions shows that it is difficult to determine the real meaning and relevance of software quality and thus the focus of the testing

activities. Testing practitioners have to deal with this variety of definitions, interpretations and approaches. I have learned over the years that in discussing the test strategy and test approach, it helps to also start a discussion about product quality. What does it mean for the stakeholders and what is expected? The framework as presented in this column has proven to be highly useful and easy to apply. Of course in practice it is often a mix, the discussion however makes things much more clearer to all, and expectations become more aligned. Such a discussion should take place on a project level, but also on an organizational level to drive (test) improvement activities. What does product quality mean for your stakeholders?

[Garvin] D. Garvin, "What does product quality really mean?", in: *Sloan Management Review*, Vol. 26, No. 1, 1984

[Trienekens and Van Veenendaal] J. Trienekens and E. van Veenendaal, "Software Quality from a business perspective", Kluwer Bedrijfsinformatie, 1997, ISBN 90-267-2631-7

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Erik van Veenendaal (www.erikvanveenendaal.nl) is a leading international consultant and trainer, and a widely recognized expert in the area of software testing and quality management with over 20 years of practical testing experiences. He is the founder of Improve Quality Services Ltd. (www.improveqs.nl). In 2007 he received the European Testing Excellence Award for his contribution to the testing profession over the years. He has been working as a test manager and consultant in various domains for more than 20 years. He has written numerous papers and a number of books, including "The Little TMMi", "ISTQB Foundations of Software Testing" and "Testing according to TMap". Erik is also a former part-time senior lecturer at the Eindhoven University of Technology, vice-president of the International Software Testing Qualifications Board (2005–2009) and currently vice chair of the TMMi Foundation.

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