

The ISO/IEC 9126-1 as a Supporting Means for the System Development Process of a Patient Information Web Service

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Abstract:

The development of patient information systems faces the mayor problems of increasing and more complex content as well as the introduction of new techniques of system implementation. An integrated development demands for a method to deal with both aspects. The ISO/IEC 9126-1 offers a framework where both views can be integrated to a general view of the system and can be used as a basis for further development. This article wants to introduce the ISO/IEC 9126-1 as a supporting means for the development of patient information systems considering the example of a web service for a patient information system.

Keywords:

Patient information system; ISO/IEC 9126; System development; Functional design; Technical design, Web service

1. Introduction

Patient information systems are becoming more and more important as the amount of information available on the health sector increases steadily [5]. But not only the availability and increasing amount of information determine the importance of patient information systems. Also the increasing need for organising and structuring the available information centres the development of patient information systems.

Apart from content concerns new techniques and concepts like Web Services or the Semantic Web technology offer a whole new range of applications to patient information systems [4,6]. Therefore also implicate increased demands on the development of patient information systems.

This states that the development of patient information systems faces two mayor challenges [6]:

- The process of system development must comply with the increasing complexity and amount of available content.
- The development has to integrate new available techniques in the implementation process of the system.

This implies that the cooperation of persons from different fields like computer science or medicine as well as the integration of their interests is a crucial factor for the success in

developing such systems [3,7]. The need for cooperation and integration leads to the problem of organising those teams from different fields in a system development process.

2. The ISO/IEC 9126

The ISO/IEC 9126 is a considerable norm for the evaluation of software products and was issued by the International Standardization Organisation in cooperation with the International Electrotechnical Commission in the year 2001. The norm divides into 4 parts:

- Part 1: Quality model
- Part 2: External metrics
- Part 3: Internal metrics
- Part 4: Quality in use metrics

The first part of the norm, the quality model, primarily deals with the establishment of a system of characteristics and subcharacteristics for the definition of software quality.

The second, third and fourth part of the norm deal with the development of criteria for the actual measurement of the characteristics defined in part one.

In this context only the first part of the ISO/IEC 9126 is to be considered important for the support in the development of patient information systems. This can be traced back to the fact that the first part provides consistent terminology through the definition of characteristics and subcharacteristics for software product quality. These characteristics also provide a framework for specifying quality requirements for software, and making trade-offs between software product capabilities.[1]

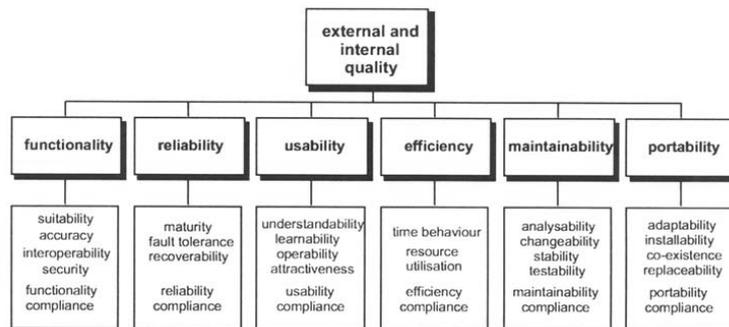


Figure 1 – External and internal quality characteristics [1]

The first part of the ISO 9126 is furthermore divided in 2 parts where the first part deals with external and internal quality and the second part covers quality in use. Quality in use offers characteristics how the quality of the system can be described from the user's point of view in a specific context or environment. Whereas internal and external quality requirements specify the level of required quality from the internal/external view of the product.[1] Figure one shows all the characteristics and subcharacteristics defined by the ISO 9126 for internal and external quality.

3. A Web Service for a patient information system

Figure 2 and figure 3 show the actual implementation of the ISO 9126-1 in the development of a Web Service for a patient information system.

The figures show the characteristics und subcharacteristics of the ISO 9126 as well as an extract from the developed requirements for this Web Service going from the root to the

branches of the mind map. This list of requirements is not exhaustive. It should exemplify how the ISO 9126 can be used in an actual system development process. The concept of this Web Service was developed in [2] and aimed for the development of a Web Service to assist a patient during the process of a breast cancer treatment. The idea for the Web Service is based on a scenario which was developed together with physicians from the University Hospital in Innsbruck [8].

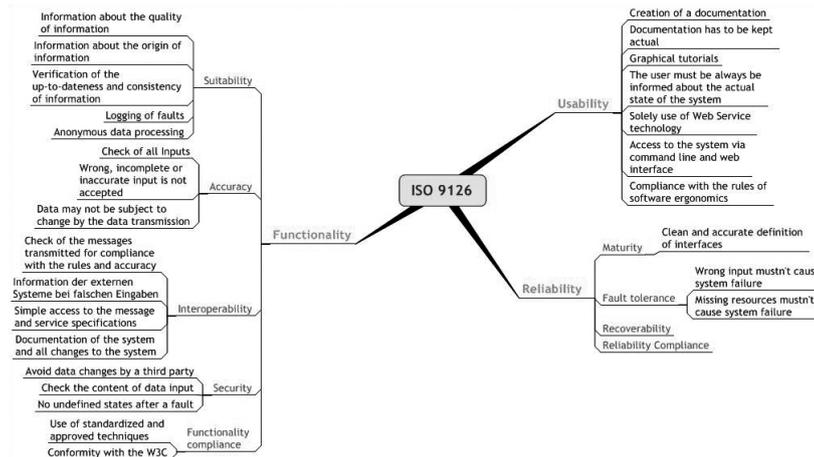


Figure 2 – Part 1: Actual implementation of the ISO 9126 in a Web Service for a patient information system

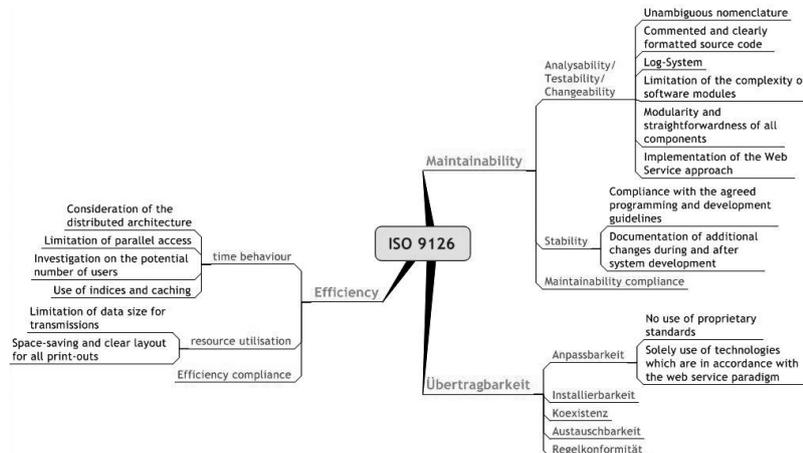


Figure 3 – Part 2: Actual implementation of the ISO 9126 in a Web Service for a patient information system

The figures show that the ISO 9126-1 with its terminology renders a structured approach for the developing team possible.

4. Discussion

The use of the ISO 9126 has a great impact on the system development process and helps to solve and assist respectively in solving several problems during the development process:

- The ISO 9126-1 provides the developing team with a consistent terminology and structure and offers a proofed framework.
- The norm helps with the definition of clear objectives for the further steps of the development process of the system.
- It can be used as a basis for a system specification.
- The ISO 9126 addresses functional as well as technical aspects in its framework.
- The integration of external and internal quality characteristics gives a complete overview of the system.
- The Framework can be used in different levels of development cause of the general terminology. This means that the ISO can be used as an accompanying throughout the whole development process.

However the ISO 9126 itself isn't sufficient to be solely used to describe all requirements of a patient information system in detail. The ISO 9126 can only be used as an initial means, to provide the further methods of system development with a structured basis of information.

5. Outlook

As mentioned in paragraph four, the ISO 9126 assists in the system development process but can not be used solely for the system description. The next step should be to define a complete system development process based on the use of the ISO 9126 as well as to further elaborate the characteristics and subcharacteristics given by the norm to better match the specific needs of the system development process in patient information system and health information systems respectively.

6. References

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