Metric for Requirements Quality Based on a Mathematical Method

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***Abstract*—Initial phase of the system developmet process (Requirements engineering) orchestrates a whole development. Requirements serve as inputs to system development process and their quality have a correlation with the end product. However, vast majority of studies on this theme exist, still the question "how to measure quality of requirements?" remains problematic due to its subjectivity.**

In this paper we present our mathematical approach for assessing a quality of requirements based on assumption about a relation between the requirements quality and a quality of the resulting product. Here we consider the corrections in requirements document done within requirements engineering (RE) and software enineering (SE) stages[Farbey,1990], and their influence on the time consuming for development process.

The suggested metric takes into account a maturity of the requirements and reflects its leverage on the product, resulting in a number from 0 (bad) - 1 (good) for a quality assesement.

I. Introduction

Initial phase of system development process (Requirements engineering) orchestrates a whole work flow of the development. It initiates with collecting customers' requirements, which are objectives for a future system; it continues with their analyses and transformations into high level and low level requirements, which are inputs for system design process; and finally, it goes with testing the system design against the requirements. It means, that requirements serve as inputs to a system development and influence the result of this process; apparently, their quality correlate with the quality of the ending product [].

A. Problem

Still the question about measuring quality of requirements remains problematic due to its subjectivity[]. However, the assessment of the requirements of quality can lead to a variety of activities in the requirements of analyses and, consequently, support a more precise calculation of required resources such as, time for project realization.

B. Contribution

Here we present our mathematical approach for assessing a quality of requirements based on assumption about a relation between the requirements quality and a quality of the resulting product.Comparing with existing approaches, discussed in section section III, our method considers a relation between quality of requirements and the resulted product measuring number of changes and time-consumption during RE and SE phases. Here we consider the corrections in requirements document done within requirements engineering (RE) and software engineering (SE) stages[Farbey,1990], and their influence on the time consuming for development process. The suggested metric takes into account a maturity of the requirements and reflects its leverage on the product, resulting in a number from 0 (bad) - 1 (good) for a quality assessment. A developed system, which has passed an acceptance test by a customer, considered as an etalon of a resulting product for a measure of its quality. Here succeeded project means a good quality of a released product, and a failed project refers to a bad quality of the product. That stands, the proposed metric for requirements quality can be applied after a project completion and serves as an assessment method for research works.

The presented approach is planned for measuring quality of requirements in our current study regarding requirements categorization and its impact on a system development life cycle.

II. Metric for Requirements Quality Based on a Mathematical Method

TODO.

A. Main Definitions

Tatiana ►description of the metric and main terms, such as quality of requirements in this metric, a resulting product (a baseline for assessment)◄

B. Method for Requirements Quality Assessment

Tatiana ►detailed description of the mathematical method for measuring a quality of requirements◄

C. Case Study

Tatiana ►An example with interpretation of results◄

III. RelatedWork

TODO.

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