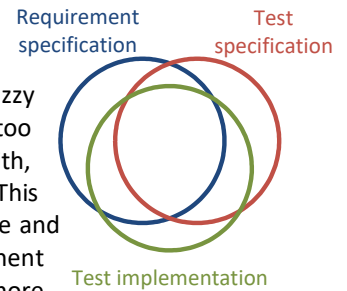




Motivation

Many software and system development projects suffer from the insufficient specification of system-specific quality attributes, such as performance, scalability or robustness. The communication of such requirements is often difficult due to their fuzzy notion, and so is the implementation and quality assurance. The consequence is too often, that NFR are retrofitted in the development process or pursued in parallel with, but separately from, other artefacts such as functional requirements or test cases. This leads in turn to inconsistencies within the development life cycle – especially in agile and DevOps environments, where the short change cycles are dependent on permanent adaptations of, e.g., tests. That is to say, the test implementations do not reflect anymore the test specification, which is typically a more technical representation of a concrete NFR.



Behaviour-driven development (BDD) is one means to specify requirements in natural language via structured text patterns. This promises to allow finding a common understanding of the requirements while strengthening their unambiguity and measurability. Yet, little is known about how and why to apply BDD exactly in context of NFR. This thesis shall provide first answers in this direction.

Tasks

The master thesis shall comprehend the following tasks as part of a joint collaboration with Siemens CT (in Munich):

- Elaboration of the state of the art in classifying and specifying non-functional requirements using pattern-based techniques. This step will be done based on work given by the advisors, such as [1].
- Selection of one, ideally two, exemplary quality attributes for further analysis.
- Elaboration of a pattern-based template for specifying the previously selected quality attributes.
- Evaluation of the templates via a case study and via qualitative feedback by domain experts.

The scope of the work is the evaluation using the pattern-based template as one means to test the sensitivity of BDD-techniques to NFR in industrial contexts. The evaluation shall thus yield a comparison of the status quo of how NFR are handled in practice without BDD-based techniques and potential benefits and barriers of applying pattern-based techniques as known in BDD. This analysis shall include quantitative as well as qualitative analyses and a critical discourse of how and why to rely on behavior-driven development for non-functional requirements.

Prerequisites

- Basic knowledge in software engineering methodologies
- The thesis will be written in English

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References

[1] Eckhardt, J. Categorizations of Product-related Requirements in Practice – Observations and Improvements, PhD thesis, Technical University of Munich, 2017.