Master thesis proposal: Scalability of Requirements Engineering Methods: Survey

Background and Motivation

The complexity and size of software intense systems continues to grow, which in turn gives increasingly large and complex sets of requirements. At the same time, requirements engineering research literature provides industrial examples [1][2] where current RE technology have a useful but partial effect. The amount of embedded software is growing, and the amount of variability is growing even faster.

The increased role and importance of software comes with an increased number of requirements. The explosion of new ideas is particularly an inevitable part of a company that operates in Market Driven Requirements Engineering (MDRE) context [3]. This flow of new requirements is almost always delivering more requirements for software products than the actual development resources can implement during each project cycle. As a result, the size and complexity of the requirements databases grow even faster than the size and complexity of actual software products.

This situation is named Large-Scale Requirements Engineering (LSRE) or even Very-Large Scale Requirements Engineering (VLSRE) and is characterized in [4]. The size of the requirements databases in this case may exceed tens of thousands of requirements, which puts new expectations on requirements management tool support. Furthermore, as development projects grow in complexity and new products with many features are released to the market, the importance of good practices in requirements management grows [5]. Improving the scalability of requirements engineering and management tools, processes and methods is crucial for succeeding in VLSRE contexts.

Thesis focus and tasks

The main goal of this thesis is to investigate the scalability of the current requirements engineering tools and techniques. The investigation is planned to be performed using the data source triangulation method, which means that the evidence should originate from multiple sources. One of the sources can be (but it is not limited to) a systematic literature review. Other source can be a web-based survey and finally the last source of evidence can be semi-structured interviews. The preliminary list of research questions contains the following questions:

- What is the reported empirical evidence of how requirements engineering methods, processes and tools scale up?
- How the issue of scalability is tackled or analyzed in the reported papers?
- Which processes, methods or tools can be considered as scalable based on the reported evidence?
- How software industry assesses the scalability of used requirements engineering tools, methods and processes?

This Master Thesis proposal is appropriate for one or two students working in parallel (the scope can be adjusted in case only one student will take this topic).

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REFERENCES