

Naming the Pain in Requirements Engineering: A Survey Design and German Results

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Abstract: This paper summarises the results published in *Information and Software Technology* in January 2015. Although researchers are investigating requirements engineering with a plethora of empirical studies, a broad empirical basis is still missing. To get a foundation about the state of the practice in RE, we propose a distributed family of open and reproducible surveys. The instrument is based on a theory that integrates a set of hypotheses inferred from our experiences and available, isolated studies. We test each hypothesis in our theory and identify further candidates to extend the theory by correlation and Grounded Theory analysis. Our results from Germany reveal, for example, a tendency to improve RE via internally defined qualitative methods rather than relying on normative approaches like CMMI. The survey design proved itself useful and is, at present, now employed in 14 countries in total (see also our website: www.re-survey.org). We found that surprisingly many aspects of the status quo and the problems are similar in the surveyed countries. Yet, there are also notable differences. We will report on both the survey design and the detailed results from Germany, and we will give an outlook on the results of the current world-wide replications of the survey.

Keywords: Requirements Engineering, Survey Research, Family of Surveys

1 Introduction

Requirements engineering (RE) is a key to successful development projects as the elicitation, specification and validation of precise and stakeholder-appropriate requirements are critical determinants of software & system quality [Br06]. Although the importance of a high quality RE has been recognised for many years, we can still observe industry struggling in defining and applying a high quality RE [Me12]. The diversity of how RE is performed in various industrial environments, each having its particularities in the domains of application or the software process models used, renders process improvement and, in particular, empirical research difficult.

Our long-term research objective is to establish an open and externally valid set of empirical findings about practical problems and needs in RE that allows us to steer future research in a problem-driven manner. To this end, we conduct a continuously and independently replicated, globally distributed survey on RE that investigates the state of the practice including the status quo, experienced problems as well as related causes and effects. Here, we report the design of the family of surveys on RE and the results obtained from its initial start in Germany (73 completed questionnaires). Our instrument relies on an initial theory obtained from available RE studies and is used to generate hypotheses

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which we test during the results analysis. The results gathered from open questions are further used to already extend our initial theory using Grounded Theory analysis. Furthermore, we investigate patterns in statistically significant correlations to find further candidate hypotheses for the theory. Finally, we will give an outlook on the results of the current world-wide replications of the survey. We published the full details of the design and the results from Germany in [MFW15].

2 Survey Design and Results from Germany

We can only give two examples of research questions from the survey design and the results from Germany. For example, we had the research question: **How is RE defined, applied, and controlled?** One hypothesis in this area was the mainly, *Requirements are elicited via workshops*. Using the results from Germany, we could corroborate this hypothesis. Another research question was: **Which contemporary problems exist in RE, and what implications do they have?** We found that *incomplete or hidden requirements* was the top-rated problem in RE practice followed by *moving targets* and time boxing.

3 Outlook

At present, we are in the process of finalising the second round of surveys which includes Germany again but has replications all over the world. It has not been a direct replication, but we refined and extended the underlying theory based on the results reported here as well as the discussions with all collaborators. We found that surprisingly many aspects of the status quo and the problems are similar in the surveyed countries. Yet, there are also notable differences. For example, we investigated the differences in RE problems between Brazilian and German countries in more detail [Me15] and found that moving targets pose a bigger problem in German companies while Brazilian companies have more problems with human collaboration.

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