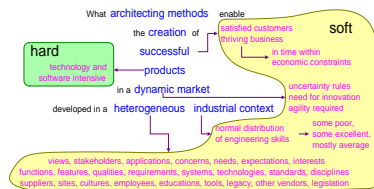


Reflection on Research Method to Study Architecting Methods

-



Gerrit Muller

Embedded Systems Institute

Den Dolech 2 (Laplace Building 0.10) P.O. Box 513, 5600 MB Eindhoven The Netherlands

gerrit.muller@embeddedsystems.nl

Abstract

The difficulties of doing scientific research on architecting methods, where many soft issues play a role, are shown. The importance of creating a scientific base is discussed.

Distribution

This article or presentation is written as part of the Gaudí project. The Gaudí project philosophy is to improve by obtaining frequent feedback. Frequent feedback is pursued by an open creation process. This document is published as intermediate or nearly mature version to get feedback. Further distribution is allowed as long as the document remains complete and unchanged.

All Gaudí documents are available at:
<http://www.gaudisite.nl/>

version: 1.3

status: finished

February 10, 2011

1 Introduction

In this chapter we look back at the research method. Where did the research method support the search for successful architecting methods? What aspects of the research methods can be improved?

Section 2 discusses the value of the research question. The *hypothesis*, the *criteria*, and the *evaluation* are discussed in Section 3. Section 4 looks back at the *case description*. The *conclusion* is formulated in Section 5.

2 Research Question

The explicit formulation of a research question has helped to focus the subject of research. The research objectives and the context have been made explicit. The intention of the research question was to limit the scope to a 'manageable' sized research project.

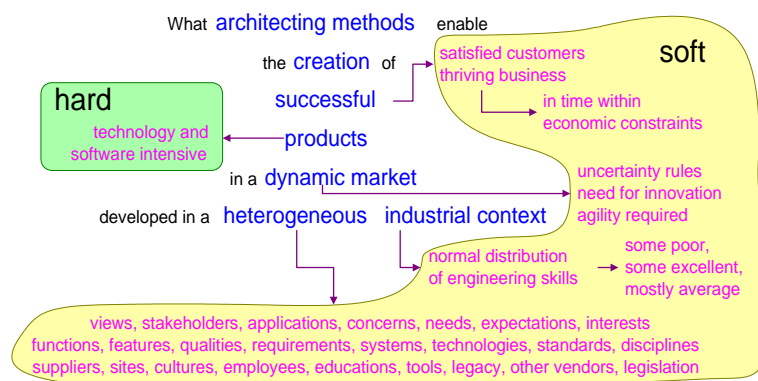


Figure 1: The original research question, characterized with hard and soft factors

The human factor is quite dominantly present in the success probability of the architecting method. Figure 1 shows the original research question, with a characterization into soft and hard factors. It is immediately clear that many soft factors dominate in the research question. These soft factors can broaden the research scope tremendously. A lot of effort in writing the thesis went into maintaining focus and into balancing hard and soft factors.

3 Hypothesis, Criteria, and Evaluation

The hypothesis (Section ??) extended the research question ((Section ??) into a statement that can be validated. The main extension is the addition of **how**. The criteria (Section ??) sharpen the hypothesis by adding **who**. The criteria were

very valuable in the evaluation, because they focused the evaluation discussion to a limited set of issues. The separation of the criteria for the different stakeholders was essential, because success is measured differently for different stakeholders.

The limitation of this research method is that the hypothesis is only made plausible. The architecting method has been demonstrated successfully in the case and partially in other situations. The hypothesis is not invalidated. In this type of research, with many soft factors, invalidation experiments are difficult: is the hypothesis invalid or did the context not fit in the soft preconditions? Repeated invalidation efforts are needed to increase the plausibility of the method.

4 Case Description

The case description is indispensable for this type of research. It illustrates the architecting method much more effectively than any theoretical text can do. The case is also essential to evaluate the hypothesis. The main weakness is that only one case is described. The soft factors are seen as context in this thesis. Soft factors play a dominant role in practice and as shown in Section 2. More case descriptions are needed to separate the method contribution better from the impact of the soft factors. Unfortunately, most cases contain too much sensitive information for the market or the competition. The research can also be extended by including more soft factors in the case description. Describing more soft factors can be privacy sensitive, because it describes behavior of individuals.

Courses and research projects are less competition sensitive. Describing cases from courses and research projects will help to improve the foundation of research methods. Of course, real industrial cases are more supportive than the more indirect cases from research and education.

5 Conclusion

The overall research method (research question, hypothesis, criteria, case and evaluation) worked satisfactory, because it helped to articulate the objectives and to focus the research. More case descriptions and more cases describing soft factors will increase the value of this type of research. In Chapter ?? future research directions are discussed.

References

- [1] Gerrit Muller. The system architecture homepage. <http://www.gaudisite.nl/index.html>, 1999.

History

Version: 1.3, date: April 7, 2004 changed by: Gerrit Muller

- added references to hypothesis, research question and criteria
- changed status to finished

Version: 1.2, date: January 19, 2004 changed by: Gerrit Muller

- some small text updates
- changed status to concept

Version: 1.1, date: January 6, 2004 changed by: Gerrit Muller

- many small text updates
- changed status to draft

Version: 1.0, date: September 29, 2003 changed by: Gerrit Muller

- created new Sections "Introduction", "Hypothesis, Criteria and Evaluation", "Case description" and "Conclusion"

Version: 0.1, date: September 29, 2003 changed by: Gerrit Muller

- moved general reflection to Chapter "Research method to study architecting"

Version: 0, date: July 11, 2003 changed by: Gerrit Muller

- Created, no changelog yet