

The Waterfall Model in Large-Scale Development

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Abstract. Waterfall development is still a widely used way of working in software development companies. Many problems have been reported related to the model. Commonly accepted problems are for example to cope with change and that defects all too often are detected too late in the software development process. However, many of the problems mentioned in literature are based on beliefs and experiences, and not on empirical evidence. To address this research gap, we compare the problems in literature with the results of a case study at Ericsson AB in Sweden, investigating issues in the waterfall model. The case study aims at validating or contradicting the beliefs of what the problems are in waterfall development through empirical research.

1 Introduction

The first publication on the waterfall model is credited to Walter Royce's article in 1970 (cf. [1]). In literature there seems to be an agreement on problems connected to the use of the waterfall model. Problems are (among others) that the model does not cope well with change, generates a lot of rework, and leads to unpredictable software quality due to late testing [2]. Despite the problems identified, the model is still widely used in software industry, some researchers are even convinced that it will be around for a much longer period of time (see [3]). The following trends can be seen in research. First, the model seems to be of very little interest for researchers to focus on as it seems to be old-fashioned. Instead, recent studies have much more focus on agile and incremental development. Secondly, there is very little empirical research backing up what we believe to know about the waterfall model. In order to identify the evidence provided by empirical research on the waterfall model we conducted the following search on Inspec & Compendex:

- (“waterfall model” OR “waterfall development”) AND (“empirical” OR “case study” OR “industrial”)