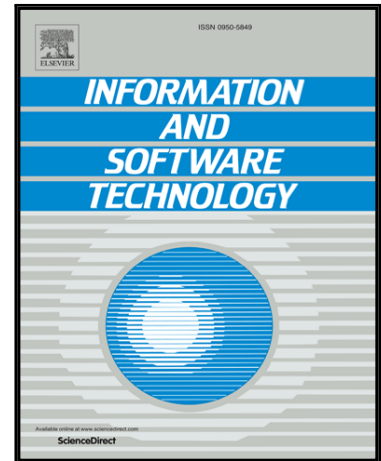


Accepted Manuscript

An Empirical Study on Catalog of Non-functional Requirement Templates: Usefulness and Maintenance Issues

Sylwia Kopczyńska, Jerzy Nawrocki, Mirosław Ochodek

PII: S0950-5849(18)30120-4
DOI: [10.1016/j.infsof.2018.06.009](https://doi.org/10.1016/j.infsof.2018.06.009)
Reference: INFSOF 6007



To appear in: *Information and Software Technology*

Received date: 22 November 2017
Revised date: 21 May 2018
Accepted date: 19 June 2018

Please cite this article as: Sylwia Kopczyńska, Jerzy Nawrocki, Mirosław Ochodek, An Empirical Study on Catalog of Non-functional Requirement Templates: Usefulness and Maintenance Issues, *Information and Software Technology* (2018), doi: [10.1016/j.infsof.2018.06.009](https://doi.org/10.1016/j.infsof.2018.06.009)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

An Empirical Study on Catalog of Non-functional Requirement Templates: Usefulness and Maintenance Issues

Sylwia Kopczyńska^{a,*}, Jerzy Nawrocki^a, Mirosław Ochodek^a

^a*Poznan University of Technology
Faculty of Computing, Institute of Computing Science
ul. Piotrowo 2, 60-965 Poznań, Poland*

Abstract

Context. Non-functional requirements (NFRs) are not easy to elicit and formulate. Therefore, some experts advocate using templates, i.e., statement patterns with parameters and optional parts. Unfortunately, there is still scarcity of evidence showing the benefits of this approach.

Objective. We aim at evaluating the usefulness of catalog of NFR templates in the context of inexperienced requirements elicitors and the effort required to maintain such catalog.

Method. To investigate the usefulness of NFR templates, an experiment was conducted with 107 participants. The participants, individually or in teams, elicited NFRs based on a business case concerning an e-commerce system.

To study the maintenance effort, we analyzed 2231 NFRs, 41 industrial projects to simulate the development of a catalog of NFR templates. We investigated how the characteristics of the catalog, essential from the maintenance perspective, change over a series of projects (a counterpart of elapsing time).

Results. The participants using NFR templates provided NFRs that were more complete, less ambiguous, more detailed, and better from the point of view of verifiability than their counterparts using the ad hoc approach. However, the catalog of templates did not speed up the elicitation process.

As regards the maintenance effort, we introduced the notion of mature catalog. In our case, ca. 40 projects were needed to make the catalog mature and then it contained 400 templates but less than 10% of them were used by a single project. The mature catalog subjected to the Pareto principle—about 20% of templates resulted in almost 80% of NFRs. Moreover, when updating the catalog after each project, less than 10% of templates had to be modified or added.

Conclusions. Catalog of NFR templates seems useful. It increases the quality of NFRs and does not hinder elicitation speed. However, it takes time to make such catalog mature.

Keywords: non-functional requirements; templates; elicitation; empirical study; usefulness; maintenance; catalog

1. Introduction

Software requirements are usually categorized into functional and non-functional ones. The former describe so-called user-valued transactions (i.e., functionality that supports the users), and the latter state conditions under which the provided functionality is really useful (e.g., maximum response time).

Non-functional requirements (NFRs) are too often neglected, especially those that are difficult to write and ostensibly obvious. That is an important risk factor, as in many cases a project failure can be traced, amongst others, to an inappropriate management of them (see e.g., [1], [2], [3], [4]).

One of the approaches aiming at improving the practice of specifying NFRs is to use *templates*. Templates, also called *boilerplates* or *blueprints*, are expressed in natural language as a text with some gaps (parameters) to be filled in and optional parts to select while formulating a requirement.

*Corresponding author

Email address: skopczynska@cs.put.poznan.pl
(Sylwia Kopczyńska)

Download English Version:

<https://daneshyari.com/en/article/8953924>

Download Persian Version:

<https://daneshyari.com/article/8953924>

[Daneshyari.com](https://daneshyari.com)