

**Reviewer's opinion
on Ph.D. dissertation authored by**

Bartosz Alchimowicz

entitled:

Automatic generation of user manual for web applications

1. Problem and its impact

The research questions targeted by the dissertation are clearly and appropriately specified in the introduction. The most important question, also reflected in the title itself, is whether it is possible to automatically generate user documentation for web applications whose quality is similar to that of content created by a human. The other research questions address issues which logically follow from the needs of the investigation of the primary issue which has a high practical significance.

2. Contribution

The main contributions of the dissertation are based on already internationally published papers and reports with the clear indication of the personal contributions by the Ph.D. candidate. These are the COCA quality model for user documentation (Chapter 4), the Automatic explanation of field syntax in web applications (Chapter 5), and ultimately the compilation of software artifacts for the automatic generation of user manuals (Chapter 6).

The fundamental contributions of the dissertation are original and appropriately presented.

One of the contributions is the definition of the orthogonality of a quality model (4.2.5) with justification. The definition states that a quality model is orthogonal if for each pair of characteristics C_1, C_2 belonging to it, there are objects O_1, O_2 which are subject to evaluation such that O_1 gets a highly positive score with C_1 and a highly negative score with C_2 , and for O_2 it is the opposite. The problem with this definition is that it is based on the existence of examples which are not appropriate for stating a generalized claim like Claim 1 about the orthogonality of the COCA quality model as explained in Sec 3.

Despite this problem with the definition of orthogonality, the actual characteristics considered in COCA (completeness, operability, correctness, appearance) are appropriate as a basis for the quality model used in the dissertation.

The automatic explanation of field syntax in web applications was proven to be no worse than man-made explanations through controlled experiments with students and a developed prototype tool explaining regular expressions.

The ultimate contribution of the dissertation is the automatic generation and quality evaluation of user manuals from software artifacts including software requirements specification with functional

requirements defined using use cases, non-functional requirements, and technical constraints, as well as a business case, acceptance tests and a running application.

3. Correctness

As mentioned in Sec.2, the claims in the dissertation can be trusted.

There are arguments however which could have been put differently. Namely, the justification of Claim 1, based on the definition of orthogonality, is accordingly performed by the description of examples showing the potential existence of user manuals which exhibit opposing evaluations along all pairs of considered characteristics (completeness, operability, correctness, appearance).

The justification of the definition of orthogonality itself claims that other characteristics like changeability and stability for example are not orthogonal, “as one strongly correlates with the other”. Following however the approach of the justification of Claim 1 on the basis of the definition of orthogonality, we could also claim that changeability and stability are orthogonal since there are certainly user manuals which are changeable and not stable, and others which are not changeable and stable. The definition of orthogonality could be based on correlation rather than examples as also stipulated by the dissertation.

The correct and critical consideration of the relevant international standards and industrial guidelines represents an important value of the dissertation. The careful presentation of the summary of quantitative experiences from the literature is another valuable aspect.

The systematic discussion of the issues and observations occurring during the practical experiments and resulting in improvements are particularly valuable as well.

4. Knowledge of the candidate

The introductory chapter and Chapter 2, discussing selected aspects of creating user documentation for web applications, as well as all details of the core chapters convincingly demonstrate the candidate’s general knowledge and understanding of the Computing discipline and the deep knowledge of the investigated special application domain.

Chapter 3 on Natural Language Processing also confirms the knowledge of the candidate in this field and will be useful in further advancing the candidate’s research beyond the results achieved in the dissertation. Further research would be interesting for example in the case of requirements specified using formal modelling.

The dissertation appropriately refers to the items of the extensive bibliography fundamentally by numbers. There are a few cases however, where the title of a standard is used alternately with the bibliography item number in different parts of the text like in the case of ISO/IEC Std 26514:2008 and [67].

5. Conclusion

Taking into account what I have presented above and the requirements imposed by Article 13 of the Act of 14 March 2003 of the Polish Parliament on the Academic Degrees and the Academic Title (with amendments)¹, my evaluation of the dissertation according to the three basic criteria is the following:

A. Does the dissertation present an original solution to a scientific problem? (the selected option is marked with X)

Definitely YES

Rather yes

Hard to say

Rather no

Definitely NO

B. After reading the dissertation, would you agree that the candidate has general theoretical knowledge and understanding of the discipline of **Computing**, and particularly the area of **Software Engineering**?

Definitely YES

Rather yes

Hard to say

Rather no

Definitely NO

C. Does the dissertation support the claim that the candidate is able to conduct scientific work?

Definitely YES

Rather yes

Hard to say

Rather no

Definitely NO



Signature

¹ http://www.nauka.gov.pl/g2/oryginal/2013_05/b26ba540a5785d48bee41aec63403b2c.pdf