

A Systematic Mapping Study of Diversity in Software Engineering: A Perspective from the Agile Methodologies (PROTOCOL DESCRIPTION)

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I. SYSTEMATIC MAPPING PROTOCOL

This document aims to describe in detail the protocol used in the systematic mapping study published in CHASE 2019:

A Systematic Mapping Study of Diversity in Software Engineering: A Perspective from the Agile Methodologies. Kohl Silveira, K., Prikladnicki, R. 12th International Workshop on Cooperative and Human Aspects of Software Engineering, CHASE (2019).

II. RESEARCH METHOD

The first phase of the study was to draw a systematic mapping, in which the guidelines on how to conduct a systematic review was considered along with guidelines provided for performing a systematic mapping by Petersen et al. [1].

A. Research questions

The goal of this systematic mapping study is to determine how diversity is being considered in software engineering more specifically when using Agile Methodologies. It leads to the following research questions (RQs):

- *RQ.1. What is reported in Software Engineering literature about Diversity?:* To answer this question, the current research literature had to be explored.
- *RQ.2. What is reported in Software Engineering literature about Diversity in Agile Methodologies?:* To answer this question, the results of the systematic mapping had to be synthesized comprehensively.

In the following, the search protocol is presented, which has been first developed by the first and second author and later been reviewed by one other researcher in software engineering.

B. Search Strategy

The research started with defining a proper scope, which was initially set to cover Software Engineering and Diversity. It led to setting the preliminary research questions and identifying the keywords. The initial keywords were searched in well-known databases such as ACM Portal and IEEE Xplore.

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Based on the search results, the research scope, research questions, and keywords were refined, search strings were reformulated, and searches were re-conducted. Moreover, the list of databases was expanded to collect as many relevant papers as possible and to run the final string we included Scopus as well. In parallel, a list of control papers was generated, which was used as a validation list to ensure the reliability and relevancy of the searches and to evaluate the search strings.

C. Search String

Search strings were formulated by combining variations for "Software Engineer" and "Software Engineering" and also a variation for "Diversity" and "Gender Diversity." The variations were included after test the strings partially and notice that we retrieve different results considering singular and plural, for example, or, when the subject is diversity, the papers are particular in the kind of diversity, for example, gender diversity. The final string is:

("Software engineer" OR "Software engineers" OR "Software Engineering" OR "software development" OR "software developer") AND (diversity OR gender OR LGBTQ OR race OR ethnicity OR "heterogeneous team")

Furthermore, some limitations were applied to the searches. The publication year was set to be between 2001 and 2018 once our RQ.2 is related to Agile Methodologies and the Agile Manifesto was published only in February 2001. This study has been conducted in December 2018/January 2019, so 2018 is entirely represented once we ran the final search string Dec 31st, 2018.

D. Study selection and quality assessment

We defined inclusion and exclusion criteria to perform the filtering in the results obtained by running the search string in the chosen databases as the following:

a) *Inclusion Criteria:* The inclusion criteria to keep a paper on this mapping follows the criteria: • Terms fulfill the search string or by similarity to the subject; • Book, Academic journal, conference and workshop papers; • Papers written in English; • Papers written from 2001 on (once the focus of RQ.2 is Agile Methodologies).

b) *Exclusion Criteria:* The exclusion criteria to keep a paper on this mapping follows the criteria: • Keywords and Abstracts which do not focus on software engineering or related areas; • Keywords and Abstracts where the word diversity is not related to Cognitive Diversity or Identity Diversity ; • Papers which do not focus on software engineering or related areas; • Papers where the word diversity is not related to Cognitive Diversity or Identity Diversity; • Proceedings; Courses; Standards; Panels; • Format is not pdf.

E. Control Papers

We generated a list of control papers which was used as a validation list to ensure the reliability and relevancy of the searches and to evaluate the search strings. Those papers were previously indicated by researchers in the area as references and followed: • From Diversity by Numbers to Diversity as Process: Supporting Inclusiveness in Software Development Teams with Brainstorming [2]; • Perceptions of Diversity on Git Hub: A User Survey [3]; • Gender and Tenure Diversity in GitHub Teams [4]

REFERENCES

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