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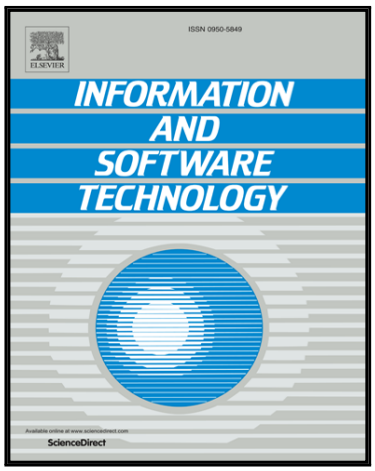

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PII: S0950-5849(18)30022-3
DOI: 10.1016/j.infsof.2018.02.006
Reference: INFSOF 5960

To appear in: *Information and Software Technology*

Received date: 20 June 2017
Revised date: 24 January 2018
Accepted date: 20 February 2018

Please cite this article as: Lucas Gren, Alessia Knauss, Christoph Johann Stettina, Non-Technical Individual Skills are Weakly Connected to the Maturity of Agile Practices, *Information and Software Technology* (2018), doi: 10.1016/j.infsof.2018.02.006

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Non-Technical Individual Skills are Weakly Connected to the Maturity of Agile Practices

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Abstract

Context Existing knowledge in agile software development suggests that individual competency (e.g. skills) is a critical success factor for agile projects. While assuming that technical skills are important for every kind of software development project, many researchers suggest that non-technical individual skills are especially important in agile software development.

Objective In this paper, we investigate whether non-technical individual skills can predict the use of agile practices.

Method Through creating a set of multiple linear regression models using a total of 113 participants from agile teams in six software development organizations from The Netherlands and Brazil, we analyzed the predictive power of non-technical individual skills in relation to agile practices.

Results The results show that there is surprisingly low power in using non-technical individual skills to predict (i.e. explain variance in) the mature use of agile practices in software development.

Conclusions Therefore, we conclude that looking at non-technical individual skills is not the optimal level of analysis when trying to understand, and explain, the mature use of agile practices in the software development context. We argue that it is more important to focus on the non-technical skills as a team-level capacity instead of assuring that all individuals possess such skills when understanding the use of the agile practices.

Keywords: skills, agile practices, code quality, empirical study

1. Introduction

Agile methods are increasingly used in industry as they are established to support projects in their success [55]. Cockburn & Highsmith [10] argue that individual competency is an important success factor in agile projects. In agile methods "the emphasis on people and their talent, skill, and knowledge becomes evident." Even on team-level, they argue that the emphasis is again "on competency rather than process." Literature suggests that we progress through two major stages during the development of a cognitive skill, a declarative knowledge stage and a procedural knowledge stage [3]. While the former can be acquired by reading text books (e.g. learn how to lead a team), the latter, the procedural knowledge, can only be acquired in process (e.g. by actually leading a team and learning from mistakes). Hence, it seems that success in agile projects depends on individual skills, that are developed in individuals over time. Many studies in software engineering have focused on explaining the individual skills (see e.g. Turley & Bieman [66]), which implies that the individual non-technical skills are believed to predict team-level performance in relation to collaborative aspects. However, no studies have looked at explicit connections between agile

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