UNIVERSITI TEKNOLOGI MARA

MODELLING SOCIO-TECHNICAL CONGRUENCE USING LOWER-LEVEL TECHNICAL DEPENDENCIES TO MEASURE COORDINATION IN SOFTWARE ENGINEERING PROJECTS

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ABSTRACT

Socio-technical congruence (STC) is a match between technical dependencies and actual coordination activities carried out by software engineers. STC reduces the resolution time for a modification request, decreases errors, and increases performance and software quality. Recent studies on STC have highlighted the inability of STC to represent a lower level of technical dependencies and the use of a limited range of actual coordination in the conceptualization. However, only a few studies investigated STC's relationship with task complexity in distributed development settings. In this study, we proposed an enhancement to the current STC model. This study enhanced the current STC model by constructing an integrated model of STC that conceptualizes lower-level technical dependencies and actual coordination and validate the enhanced STC model on task complexity in distributed software development. We performed linear regression analysis on three open-source software projects at the component level and discovered a significant negative relationship between congruence and task complexity. We observed that higher congruence would decrease the changes made in lower-level technical dependencies (component level) to complete modification requests. We also observed that congruence does not necessarily reflect task complexity when developers are already aware of the area of change. This study contributes the following: 1) an enhanced STC model and 2) an additional piece of empirical evidence on the relationship between the enhanced STC model on task complexity in distributed software development.

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