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## Assessing the impact of socio-technical congruence in software development: a systematic literature review

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### Abstract

Software development is a critical task that depends on coordination among team members and organizational activities that bring team members together. The literature indicates various techniques that have been applied to control the coordination level among team members. Notable among these techniques is social-technical congruence (STC), which helps to measure the alignment between the social and technical capabilities of an organization and teams at various stages of software development. The dynamic nature and changes of coordination requirements make STC a potential research area in this regard. The main objective of this study is to perform a systematic literature review (SLR) that recognizes and structures existing studies that represent new evolutionary trends in the field of STC. A SLR is performed of 46 publications from 4 data sources, including journals, conferences and workshop proceedings, most of which were published between 2008 and 2019. To this end, a thorough analysis is carried out to elicit the studies based on 7 research questions in this SLR. The outcome of this SLR is a set of ample research studies representing various aspects, performance impacts, factors, and evolutionary trends in the field of STC. Furthermore, STC measurement techniques are classified in two distinct groups, matrix based and social network analysis-based measures. After a systematic exploration of these aspects, this study results in new insightful features and state of art of STC. This SLR concludes that some areas still require further investigation. For instance, (1) STC-related literature exists, but only one research work mainly focuses on the risk of overwhelming STC (i.e., excessive STC measurement may overburden the software development process); (2) STC measurement techniques facilitate the identification of congruence gaps, but no attention has been given towards the unweighted

social network analysis based STC measurement models; (3) STC measurement techniques are generally applied in the development phase of

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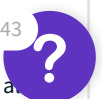
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the project lifecycle, but these measurements are rarely used in other software development phases, such as the requirement and testing phases or all phases; and (4) The development factors that effects on STC measurement are rarely focused by researchers in the context of various domains.

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