

ABSTRACT

An Examination of the Relationship between Social Capital Theory and Software Quality in Free and Open Source Software Development

Steve Donnahue Whyte

As individuals and firms increasingly consider free and open source software (FOSS) as possible alternatives to proprietary packages, they are faced with the challenge of evaluating the uncertainties of several key software quality related facets such as development and product continuity, community support, product selection, maintenance and product usage. This challenge is further compounded by the fact that FOSS product quality is difficult to determine using established traditional software quality models. This study formulates and tests a theoretical model to determine open source project success based on the extent of the social relationships between members of FOSS project communities. The model applies Social Capital Theory as its basis and tests are conducted using secondary data stored within the SourceForge Research Data Archive repository.

The results suggest that the level of interaction amongst core members, moderated by the centrality position of bug reporters in online discussion forums who report software bugs is significantly related to project success. The low explanatory power associated with the overall results however suggests that further research is needed in order to investigate whether other existing factors may need to be considered when examining success in FOSS communities or whether social capital may need some type of context when used to examine FOSS project success.

As a contribution to theory, seven previously uninvestigated hypotheses are tested and implications for practice derived. This study further contributes to knowledge as the empirically tested results have added to the recent and continued debate on the extent and the level of impact of social capital on FOSS project success.

This study contributes to methodology by proposing a more comprehensive model of the social capital structures associated with successful FOSS projects than current models by the inclusion of a more comprehensive set of influential factors to provide greater explanatory power.

Keywords: Steve Donnahue Whyte; Social Capital Theory; Social Network Analysis, Free and Open Source Software; Software Quality; Open Source.