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COLLABORATION THROUGH OPEN SUPERPOSITION: A THEORY OF THE OPEN SOURCE WAY¹

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This paper develops and illustrates the theory of collaboration through open superposition: the process of depositing motivationally independent layers of work on top of each other over time. The theory is developed in a study of community-based free and open source software (FLOSS) development, through a research arc of discovery (participant observation), replication (two archival case studies), and theorization. The theory explains two key findings: (1) the overwhelming majority of work is accomplished with only a single programmer working on any one task, and (2) tasks that appear too large for any one individual are more likely to be deferred until they are easier rather than being undertaken through structured team work. Moreover, the theory explains how working through open superposition can lead to the discovery of a work breakdown that results in complex, functionally interdependent, work being accomplished without crippling search costs. We identify a set of socio-technical contingencies under which collaboration through open superposition is likely to be effective, including characteristics of artifacts made from information as the objects being worked on. We demonstrate the usefulness of the theory by using it to analyze difficulties in learning from FLOSS in other domains of work and in the IS function of for-profit organizations.

Keywords: Open source, information systems development, materiality, socio-technical system, collaboration, coordination

Introduction

The success of new ways of organizing closely associated with information systems, such as open source software and Wikipedia, is surprising because these modes of work blend three circumstances previously found to be challenging: working at a distance (e.g., Lipnack and Stamps 1997; Olson and Olson 2000), working with sporadically available volun-

teers (e.g., Dunlop 1990; Handy 1988) and working on complex artifacts such as software and documents (e.g., Herbsleb et al. 2001; Kittur and Kraut 2008). Unsurprisingly, then, many researchers and managers look to these ways of organizing for inspiration for virtual work generally, hoping to learn from their example (e.g., Agerfalk and Fitzgerald 2008; von Krogh and von Hippel 2003; Scacchi et al. 2006; Stewart and Gosain 2006). Accordingly there is a need to develop theory that provides insight into how such ways of organizing function and under what conditions they are likely to be successful and transferable to other virtual collaboration settings.

Key to our empirically based theory are the material characteristics of the work done in these settings, specifically soft-

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