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2014

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citation for published version (APA)

Manteli, C. (2014). *The Effect of Governance in Global Software Development: Analyzing Transactive Memory Systems*.

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Samenvatting

The effect of Governance in Global Software Development: Analyzing Transactive Memory Systems

“Software is created by people for people working in a range of environments and under various conditions” [151]. Understanding therefore the human aspects of software engineering is imperative and this thesis builds upon that knowledge. Focusing on people, we perform an interdisciplinary research and propose the use of theories from the social and business science in order to understand phenomena in the field of software engineering and particularly, in global software development (GSD). This thesis focuses on the effect of global software governance on transactive memory systems (TMS) by taking a social network perspective.

We contribute to the field of GSD with a simple and yet useful governance model. Essentially, we suggest managers to consider three questions when analyzing their GSD activities; (1) what is (or will be) the business strategy between remote offices? (2) how tasks are (or will be) allocated? and (3) how teams are (or will be) structured and organized? We use these three simple questions in several case studies and our empirical observations suggest that they can provide a clear insight on the basic GSD activities of the particular cases, but also an effective mechanism to compare cases. After all, “governance is about considering the efficacy of alternative modes (means) of organizing a business and selecting the best mechanisms to suit the circumstances at hand” [5]. Combining these three simple aspects of governance, scholars and practitioners can use our proposed methods as a “cause and effect” tool to evaluate GSD collaborations. Eventually, a knowledge library can be created with different “cases” that can be used as a reference to other studies. From a more practical point of view, GSD practitioners can use the knowledge library to compare and evaluate their current situation and assess future transformations.

We also use transactive memory systems as a way to measure expertise and team awareness in GSD. Awareness is necessary to coordinate group activities and ensure that individual contributions are relevant to the whole group. At the same time, awareness is a cognitive concept and as such is not easy to capture and measure. Originating from the field of psychology, we find that TMS theory serves our purpose, providing a systematic way to identify and measure team awareness. Additionally, TMS theory focuses on the specific (expertise) knowledge that each member possesses rather than on the common knowledge that all members share. Hence, using transactive memory systems can improve GSD collaboration performance and productivity. As long as software is being built by people, these people need to know each other, to access and trust each other and

of course, to communicate with each other. All these transactions can be identified and measured using our proposed method. Transactive memory systems can facilitate team building, enforce relationships between people from different geographic locations and improve coordination.

Furthermore, we use social network analysis (SNA) to explore collaboration in global software development. Networks are a general yet powerful means of representing patterns of connections or interactions [131]. In this thesis, we use SNA methods to explore the interactions between distributed teams, how remote members are connected with each other and what kind of collaboration patterns exist. The use of social network theory in GSD proved beneficial in several ways. First, SNA methods allowed us to “draw” and visualize the collaboration between distributed teams. These visualizations give a common ground for discussion with people from all levels in the organization. Second, SNA methods help us identify the important members of the GSD network. A third contribution of SNA is the focus on the dynamic nature of global software development. Building software is all about people and teams, where memberships are changing, relationships evolve and consequently global software development becomes a volatile activity. Using SNA, we were able to capture “snapshots” of the collaboration activities over time, and observe their evolution.

Concluding this four-year research program, we learn that “people are data too” [20]. Managing global software development activities is not just about processes and procedures but above all is about the people. Our results provide an insight to high- as well as middle-level managers on how their decisions affect software engineers, architects, testers, team leaders and all those who build software in distributed environments. Research-wise, we encourage future interdisciplinary studies where theories and concepts from one field can enforce results and observations in another.