A Systemic Framework for Facilitating Better Client-Developer Collaboration in Complex Projects

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ABSTRACT

The article presents a framework for facilitating better collaboration between clients and developers in software requirements formulation. A mix of systems methods from soft systems methodology, critical systems heuristics and the work system method is justified through the principles of critical systems practice. It is particularly relevant for project contexts characterized by diversity of stakeholder values and significant complexity. The contribution of the article for the field of Information Systems is in the proposal of a systemic framework for promoting organizational learning about software requirements formulation. From a practical point of view it reduces the complexity of using systems thinking in software development as the selected methods are simpler to use than the whole system methodologies to which they belong.

KEYWORDS

Critical Systems Heuristics, Critical Systems Practice, Soft Systems Methodology, Software Requirements, User Participation, Work System Method

INTRODUCTION

The annual surveys of the Standish group show that user involvement appears to be one of the two most significant factors that contribute to an IT project's success according to Carroll (2013). The increased interest in the topic is manifested in three recent systematic reviews in the software engineering literature (Abelein & Paech, 2015; Bano & Zowghi, 2015; Brhel, Meth and Maedche, 2015). The problem of user involvement/user participation (we will use these notions interchangeably) in Information Systems Development (ISD) has been investigated in ongoing research for over forty years (Hirschheim & Klein (2012).

Markus & Mao (2004) present a thought-provoking paper on user participation. They provide a deep analysis of the topic and call for rich participation by clients in software projects stating, "that it is not the mere fact or quantity of participation that matters, but also the quality of participation" (Markus & Mao, 2004: 536). They describe that rich participation is encouraged by using analysis

techniques that are appropriate for users with non-specialist IT knowledge, by choosing analysis techniques that capture socio-technical requirements in addition to functional requirements, and by using a "facilitation" approach rather than a "technical expert" approach to participation.

An extension of the ideas of Markus & Mao (2004) was provided by Alter (2009) who called for "project collaboration" rather than "user participation". Alter uses the term "project collaboration" to clarify the extent to which users should be involved, and the need for a comprehensive consideration of all aspects of the project rather than just the technical issues. The above recommendations of Marcus & Mao (2004) and Alter (2009) were the primary motivation for this research.

The issue of client-developer collaboration in formulation of software requirements becomes especially complicated for projects characterised with multiple stakeholders with diverse interests and larger project complexity. Complex ISD projects involve necessary organizational learning to address their complexity and the application of methods that support such learning. This is another motivation for this research. Organizational learning has been promoted among other methods also through systems thinking. Mora, Gelman, Forgionne, Petkov and Cano (2007) analysed the potential of systems thinking for IS research and motivate that the systems approach is most likely to complement the technical analysis of a problem.

A prevalent way in which systems thinking has been used in the Information Systems discipline is through Soft Systems Methodology (SSM) (see Checkland, 1999). Efforts for linking SSM to more formal software requirements elicitation techniques have however been more difficult in practice. Despite the strong IS research tradition in SSM and the growing interest in other systems methodologies, the level of their practical use is relatively low. A possible reason is their complexity if applied as whole methodologies. The search for reducing such complexity through using only some techniques or methods from certain systems methodologies was a further motivation for this research.

The goal of this research is to extend further the ideas of Markus & Mao (2004) and Alter (2009) by proposing a systemic framework for enhancing collaboration between clients and developers. This collaboration will lead to better understanding of software requirements resulting in a more appropriate system for the clients. The framework is using a mix of systems methods from different systems methodologies to suit the multifaceted dimensions of complex ISD projects and to promote organizational learning.

The contribution of the paper for the field of Information Systems is in the proposal of a systemic framework for promoting organizational learning about software requirements formulation. From a practical point of view, it reduces the complexity of using systems thinking in software development as the selected methods are simpler to use than the whole system methodologies to which they belong. The paper proceeds with a review of past research on user participation, an overview and justification of the selected methods from certain systems methodologies, a summary description of the framework, and a brief report on an application of the framework and conclusion.

REVIEW OF THE LITERATURE ON USER PARTICIPATION IN SOFTWARE DEVELOPMENT

Ives & Olson (1984) conducted a review of 22 empirical studies on the relationship between user involvement and system success. They were unable to demonstrate a relationship between the two which was attributed to severe methodological and measurement problems. A later paper reviewed 23 empirical studies on user participation and system success between 1981 and 1992 and found that 43% of the studies reported positive results and 57% - negative (Lei, 1994). Hirschheim and Newman (1991) go so far as to discuss user involvement and the anticipated benefits as one of the 'myths' of ISD. They argue that the underlying cause for this is that the ISD process is largely a social process which is usually ignored.

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