

Understanding the Influence of User Participation and Involvement on System Success – a Systematic Mapping Study

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Abstract: *Context:* User participation and involvement in software development are considered to be essential for a successful software system. We think it is important to analyze user participation and involvement in software engineering comprehensively to encourage further research in this area. *Objectives:* We investigate the evidence on effects of user participation and involvement on system success and we explore which methods are available in literature. *Methods:* A systematic mapping study was conducted. The systematic search yielded 3,698 hits, from which we identified 289 unique papers. *Results:* Based on the empirical evidence of the surveys and meta-studies, we developed a meta-analysis of structural equation models. The analysis of the proposed solutions from the method papers revealed a wide variety of user participation and involvement.

Keywords: User Participation, User Involvement, Software Development, Systematic Mapping Study, Literature Review, Meta-Analysis

In the paper [AP15] we describe a systematic mapping study that examines the influence of User Participation and Involvement (UPI) on system success. We followed the guidelines of [KCh07]. The objective of the study was twofold. First, we wanted to figure out if an increase of UPI increases system success. Second, we wanted to identify the characteristics of methods that increase UPI within software development. To validate the effect of UPI, we used meta-analytical techniques. We extracted the researched aspects, correlation data, variation, and number of participants for validation from 86 studies. The most important finding is that the vast majority of the derived correlations showed a positive effect, thus we can conclude that aspects of the development process and human aspects have a positive effect on system success. In addition, we found that most studies with negative correlations were published more than 10 years ago. These results increase the confidence that UPI is beneficial to system success, which is an important finding for other researchers that develop methods to increase UPI in software development. Nevertheless, the large variation of correlations shows the complexity of measuring and studying UPI. Another important contribution of this paper is the developed classification of the aspects of UPI. This classification can support researchers interested in studying the aspects of UPI.

From the 36 methods papers, an important finding is that all software development

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activities are influenced by the methods, but only few methods focus on the design and implementation activity. This insight can support other researchers in the identification of existing research gaps for methods that aim to increase UPI. In addition, an important contribution of this paper is the structured overview of practices with method examples. The overview shows that practices derived from the solutions have a wide variety in all software activities. The overview is particularly helpful for practitioners, who want to use existing practices and methods to increase UPI in software development. In addition, it can also be valuable to other researchers to understand the state-of-the-art research of UPI methods in software development. The comparison between aspects researched by the surveys and the targeted aspects from the methods reveals that methods for user participation and involvement target similar categories as the surveys. In addition, they target mostly the success factor system quality, which differs from the survey papers that mostly research user satisfaction. The analysis of the validation context revealed that most methods were validated in a public environment.

Overall, we conclude that the systematic mapping study shows a positive correlation of various aspects of UPI on system success. However, there is still no common conceptual model to measure and validate this effect. We identified a broad variety of methods to increase UPI in software development, but they have been validated mostly in smaller projects and in the public sector areas. We therefore suggest to further research and develop new methods for other contexts. Especially in large-scale information technology projects, UPI is not a common practice [A02]. As a follow up to this paper we developed the UDC-LSI method to enhance user-developer communication in large-scale IT [A15]. The analysis of aspects did indicate only little focus on organizational factors or system attributes. However, when we consider large information technology projects within big companies, these projects are heavily influenced by factors such as the complexity of the system and the managerial culture of the organization. Thus, we emphasized those aspects in our UDC-LSI method. In addition, our method also focuses on the software design and implementation activity, as the study reveals that only few methods focus on UPI in these activities, even though within these activities a lot of important decisions are made.

References

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