Abstract

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A framework for modelling and utilization of users' feedback for software systems evolution.

Most software systems operate within a complex and variable context. This poses a challenge for the requirements engineering of their software systems mainly to ensure those requirements keep pace with the changing context. To cater for such volatility, users’ feedback about software, while it’s in use, is a powerful tool that enables the capturing and communication of a richer and deeper knowledge on how they view the software. Users understand the software as a means to meet their requirements and needs, thus, giving them a voice in the continuous evaluation of software would naturally fit this level of abstraction. This contributes in identifying problems in the software, modifying existing requirements requesting new additional requirements leading to better users’ acceptance of the software. The traditional approach to users’ feedback, which is based on data mining and text analysis, is often limited, partly due to the ad-hoc nature of users’ feedback and, also, the methods used to acquire it, which are either overly relaxed, e.g. natural language and forum-like that endure a lot of impression and ambiguity, too restrictive, e.g. ranking. To maximize the expressiveness of users’ feedback and still be able to efficiently analyse it, this work proposes that feedback acquisition should be designed with that goal in mind. Hence, the need to provide foundations to develop systematic methods for the structuring and use of users’ feedback is advocated in this thesis. Also, users’ evaluation feedback, while the software is in use, could be used to support engineers in accomplishing evolution tasks and taking maintenance decisions. However, there is no formalized specification that properly documents the users’ problems. Besides that there is a lack of systemized methods of extracting the problems into formalized reliable specifications. In traditional methods engineers end up with huge data reporting user problems, which requires a great deal of effort and time to analyse and come with useful conclusions. This research contributes to that aim by creating novel classifications of users’ perspectives on feedback types and their constituents and how they could be structured. Furthermore, a formal systematic process for feedback acquisition and communication was developed to help engineers accomplish their tasks and to further utilize the captured feedback in extracting new/ changing requirements information. Finally, a socio-technical technical architecture is developed to illustrate how the formed workflows, methods, and models interrelate to realize the research aim.