COMPUTER SCIENCE REVIEW 13–14 (2014) 75–93

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/cosrev

Survey

Social computing for software engineering: A mapping study

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ARTICLE INFO

Article history:
Received 10 April 2014
Received in revised form
30 June 2014
Accepted 27 August 2014
Published online 23 September 2014

Keywords:
Social computing
Software engineering
Systematic mapping

ABSTRACT

There is a continual growth in the use of social computing within a breadth of business domains; such as marketing, public engagement and innovation management. Software engineering research, like other similar disciplines, has recently started to harness the power of social computing throughout the various development phases; from requirements elicitation to validation and maintenance and for the various methods of development and structures of development teams. However, despite this increasing effort, we still lack a clear picture of the current status of this research. To address that lack of knowledge, we conduct a systematic mapping study on the utilisation of social computing for software engineering. This will inform researchers and practitioners about the current status and progress of the field including the areas of current focus and the geographical and chronological distribution of the research. We do the mapping across a diversity of dimensions including the activities of software engineering, the types of research, the characteristics of social computing and the demographic attributes of the published work. Our study results show a growing interest in the field, mainly in academia, and a general trend towards developing designated social computing platforms and utilising them in mainly four software engineering areas: management, coding, requirements engineering, and maintenance and enhancement.

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http://dx.doi.org/10.1016/j.cosrev.2014.08.002
1574-0137/

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1. Introduction

A quality software product is the outcome of a good software development process, in which the collaboration amongst stakeholders is designed to work properly and in a sustainable manner. One aspect that assists in building a working collaboration is the establishment of solid communication, coordination, and awareness amongst stakeholders. The research in various disciplines, such as Computer Supported Cooperative Work [1] Global Software Engineering [2], Cooperative and Human Aspects of Software Engineering [3], and Social Software Engineering [4], has investigated various ways to build and maintain such work collaboration and support the software engineering process. The emergence and wide popularity of social media and Web 2.0 technology encouraged the research on utilising these techniques in the context of software development.

Social interaction, which is viewed as a core component of software engineering, takes place amongst various stakeholders and developers. The use of social computing in software engineering, viewed as a highly interactive activity, is advocated as a rich means to increase the efficiency of interaction in terms of clarity and speed of communication, situational awareness, documented and easily searched interaction, and community forming. Using social computing in the context of software engineering is challenging and requires an investigation on when and how to conduct it and with whom, i.e. it requires an engineering process itself. Commercial social computing falls short in serving the diversity of software development activities and development styles and teams. For example, a popular de facto social network is too generic to serve as an efficient communication medium between end users and developers. This has motivated researchers to investigate how to develop social techniques that are expressly tailored to the peculiarities of software engineering.

Although the field has attracted a wide range of researchers and practitioners, we still have no clear picture of its current state. Systematic mapping studies are powerful tools to explore the extent to which the research has been conducted and applied, and also investigate the distribution of that research with regard to certain criteria [5–7]. To