A Survey of Social Media Use in Software Systems Development

Sue Black
University of Westminster
Department of Information and Software Systems
London HA1 4TP
+44(0)2079115000
s.e.black@wmin.ac.uk

Rachel Harrison
Oxford Brookes University
Dept of Computing & Electronics
Wheatley, Oxford OX33 1HX, UK
+44 (0)1865 484506
rachel.harrison@brookes.ac.uk

Mark Baldwin
University of Westminster
Department of Information and Software Systems
London HA1 4TP
+44(0)2079115000
baldwim@wmin.ac.uk

ABSTRACT
In this paper, we describe the preliminary results of a pilot survey conducted to collect information on social media use in global software systems development. We created an on-line survey for developers who are using social media to communicate at work and whose work falls within the domain of software systems development, including web applications. Our results show that social media can enable better communication through the software system development process. 91% of respondents said that using social media has improved their working life.

Categories and Subject Descriptors
D.2 [Software]: Software Engineering; D.2.7 [Software Engineering]: Distribution, Maintenance, and Enhancement

General Terms
Measurement, Experimentation.

Keywords
Web 2.0, Social Media, Tools, Distributed Teams, Software Development, Software Quality, Collaborative Development.

1. INTRODUCTION
Over the years organizations have restructured themselves to take advantage of global working and have become highly dependent upon communication technologies. Recently this has come to include social media tools such as Twitter, Facebook, Instant Messaging, etc. The uptake in use of social media tools is currently rising extremely quickly, Facebook now has over 400 million users and Twitter over 50 million, see Figure 1.

This rise in uptake and use of social media tools is explained well in Clay Shirky’s book “Here comes everybody” [4]. Shirky describes how the most profound effects of social tools lag their invention by years, because it isn’t until there is a critical mass of adopters who take the tools for granted that their real effects begin to appear. Use of social media with the resultant shared awareness allows otherwise uncoordinated groups to begin to work together more quickly and effectively. Because developing software and the software engineering process involves interaction between various parties including clients, developers, architects and managers etc., social media holds much promise for the improvement in communication between the parties involved and thus the resultant software.

How we interact online is changing gradually but dramatically. Increasingly people are engineering software, databases and web sites so that they not only meet private objectives, but so that they can be used in ways that the originators did not know or understand [5] The internet and social media created space is now the world’s biggest coffeehouse with social media giving people a chance to say whatever they want. This includes not only directly discussing topics with others online, but also ‘osmotic communication’ [2] where conversations are overheard. If Twitter is run in the background using an application such as Tweetdeck, it can be like listening to people talking in the background [1].

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In order to better understand the use of social media we conducted an online survey. We wanted to determine whether social media tools are being used by developers and if so, whether this use has been successful. Technology delivers messages that are understood within a particular context and provides support for collaborative working when face-to-face communication is impossible. In multidisciplinary teams that may involve a large number of people, unambiguous communication can be critical to the success of a project. It can also be very difficult to achieve. To investigate this we carried out an online survey into the use of social media for global software systems development. Respondents were recruited through Twitter, we realize that this adds bias to our results, but consider our results valid and useful within this restricted context. This paper describes our data collection, data analysis and our initial conclusions.

2. THE RESEARCH QUESTION
We wanted to understand the problems and complexities of using social media systems, particularly those occurring during global software development. Our underlying motivation was to determine how well the gap between social and technical parts of a project can be bridged by social media. We felt this was best achieved by a survey. Our aim is to answer the research question: “Are social media tools being used by software systems’ developers and if so, is this use successful?”

3. METHOD
We used surveys as our primary research method. Surveys (including online questionnaires and unstructured interviews) were appropriate because they enabled us to collect a large amount of relevant data relatively cheaply and within a reasonably short time frame. Unstructured interviews were used to provide corroborative evidence for validation of the results. Formal experiments would be more difficult to use for this research because of the difficulty of specifying all variables, and the high staff costs due to the necessary replication in a controlled setting. Ethnography could be used for this research but would involve transferring a member of the team to industry and this would also raise the cost of the research. There are 2 main parts to performing the survey, described in this section.

3.1 Data Collection and Analysis
The survey was carried out online using the FluidSurveys\(^1\) tool. The survey contained 19 questions to generate data concerning selected topics. Users were self selecting, they responded to a tweet sent out by one of the authors (@Dr_Black) on Twitter asking for those involved in global software development to participate:\(^2\):

**Do u work in software systems development + use social media 2 communicate? If so please take our survey:**
http://tinyurl.com/yavuwj7

We received 31 responses with 48% completion. The questions included a mixture of check boxes, ranges, direct closed questions and open questions requiring freeform responses. The survey can be found on the FluidSurveys website\(^3\). The survey was not drawn from a random population, as all the respondents had a pre-existing link to one of the authors.

Both qualitative and quantitative analyses of the survey data were undertaken. Two of the authors analyzed the data independently to ensure consistency.

4. RESULTS
The demographics of the participants were quite interesting. Most of the participants’ jobs were found to be at a senior level. More men than women participated in the survey but cross tabulation showed that this did not have an effect on subsequent responses.

**Figure 2. Gender of respondents.**

However we did find a difference in educational profile with a higher proportion of men than women having a formal qualification such as a bachelors or masters-level degree.

**Figure 3. Comparison of education vs gender.**

The average age of our survey participants was found to be just over 41 with quite a small spread. Again age did not account for any chosen responses.

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\(^{1}\) http://fluidsurveys.com/

\(^{2}\) http://twitter.com/Dr_Black/status/6526721211

\(^{3}\) http://fluidsurveys.com/surveys/dr-black/socialmediausinglobalse/
We found that the participants' length of time with their employer was fairly evenly distributed. A quarter of the participants had worked for their employer for between 2 and 5 years.

It is interesting to note that nearly all of the respondents (91%) used social media to communicate with their colleagues. It should be noted however that the respondents were not a random sample of people involved in software system development.

In fact 66% of these people reported that they were part of a team in which all team members all use social media for this purpose.
Which social media applications do you use at work to facilitate communication?

![Social Media Applications](image)

**Figure 9. Social media tools used at work.**

Nearly all of the respondents (91%) said that using social media at work has improved their working life.

What information do you communicate using social media?

![Type of Information Communicated](image)

**Figure 10. Type of information communicated via social media.**

We found that quite technical information is communicated in this way, including for example source code, specification and design. However the most common use (by far) was found to be communicating new ideas.

A high proportion of the respondents (85%) reported also using social media for making social arrangements. Those using social media in a work context also tended to use it in a social context.

The amount of time spent using social media needs to be interpreted with care, as it is not clear whether the responses refer to the amount of time an application spent running in the background or refer to a literal measurement of activity time. However the average time spent was 2.5 hours per day. This is a significant amount of time however it is interpreted.

Social media clearly provide very popular and useful tools. Some interesting comments were revealed by the open question “What can the team do now that they could not do before?” which revealed that the convenience of communication is the key improvement. Communications can now be carried out anywhere at any time, rapidly and in real time. Using social media is seen as a replacement for email.

Our unstructured interviews also yielded interesting comments. For example, several interviewees reported using social media constantly at work, running in the background. In our small pilot interviews this was shown to be a common modus operandi. Although these applications can be used for idle chatting they are obviously also a useful work communication tool, facilitating real-time responses to crises that can occur in internet time, 24 by 7.

**5. CONCLUSIONS AND FUTURE WORK**

This paper has described the preliminary results of a pilot study conducted to collect information on the use of social media in global software systems development. We used Fluid Surveys® to host and Twitter to promote the survey. Clearly there are several threats to validity involved in our approach. These include the non-random selection of respondents and the small number of respondents as well as the recruitment of respondents through social media. This self-selection and size restriction prevent the results from being generalized. Our results are nevertheless interesting and useful.

The preliminary results of our pilot survey suggest that the answer to our research question: “Are social media tools being used by systems’ developers and if so, is this use successful?” is undoubtedly yes. However, we are aware that there are threats to the validity of this research.
We found some interesting information from our survey. Respondents use social media tools for several hours per day (most probably leaving them running in the background whilst working), mainly to discuss new ideas and specification, design and code related issues. Social information was also discussed. Most respondents used more than one social media tool, Twitter and Instant Messaging are the most popular.

In the future we intend to investigate the phenomena of social media further. We will improve our questionnaire in light of our pilot survey results, we also intend to improve the survey response rate and to gather a larger data set from a random sample. We will use both structured and unstructured interviews to validate the survey responses.

6. ACKNOWLEDGMENTS

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7. REFERENCES


