
Environmental Jolts: Impact of Exogenous Factors on Online Community Participation

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Abstract

Few studies of online communities take exogenous factors into account while explaining community participation. We present preliminary results from a study investigating the impact of steward companies' actions on online community participation. We identified two events: (1) open sourcing of Java by Sun and (2) acquisition of Sun (and consequently of Java) by Oracle, and examined participation in their developer online communities. We found significant change in participation levels around each event with both significant increases and decreases. We conjecture that participation increased if the action was perceived as supportive by developers (e.g. Sun's open sourcing of Java) whereas it decreased if the action was perceived as detrimental by developers (e.g. Oracle's acquisition of Sun).

Keywords

Online communities, participation, environmental jolts, open source, design.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Management, Human Factors, Design, Experimentation.

Introduction

Numerous studies have examined diverse online communities to identify factors that affect participation. Significant issues that have emerged include motivation, critical mass, contributions, and social structure [7]. Overall, member participation – in terms of quantity and quality – has been found to have a significant effect on community sustenance and growth [2] and therefore an influential stream of research therefore suggests that online communities can be designed to be successful and many design principles have been recommended [1, 3, 6].

However, an understanding of how online participation might change as a result of exogenous or external events – events whose influence is outside the scope of community design is absent from prior work. Not all changes and interactions in online communities can be attributed to internal factors. Online communities, similar to offline communities, are embedded in larger organizational, institutional and field contexts [8]. Specifically, many online communities are stewarded – hosted and cultivated – by commercial firms (e.g. Amazon) and these communities are influenced by changes in stewardship (e.g. change of ownership).

In this study we use the concept of environmental jolts [4] to exemplify the effect of large-scale exogenous events on participation in online communities. Jolts are transient shocks that cause temporary disruptions that perturb their organizational inhabitants and then they subside [5]. Although environmental jolts rarely threaten survival of soundly designed organizations, but they can trigger responses that reveal how organizations adapt to their environments [5]. We argue that a deeper understanding of the role of

external events can complement the body of knowledge on community systems design and enhance our understanding of participation changes that accompany external events.

Research Study

We examined changes in participation in online developer communities triggered by two significant events: (1) open sourcing of Java by Sun (Nov. 19, 2006) and (2) acquisition of Sun (and consequently of Java) by Oracle (April 20, 2009). Both events represent a change either in the nature of product or in the ownership of the product and consequently the stewardship of the associated online community.

Methodology, data Collection, and analysis:

The target online community to study both events was the newcomer forum for Java developers. Data were collected by parsing the public information on the forum over a four year period starting 1st January 2006 through 31st January 2010 (To include a pre and post period for both the events - Open source release (November 2006) and the Sun – Oracle deal (April 2009)). We compared forum participation in the eight months before and after the two events: first we examined participation data around the Sun announcement of the open source release of the Java code. We compared the number of new users who registered for the forum, and then compared two aspects of user interaction – the number of discussion threads in the forum and the number of posts in the discussions. Next, we carried out a similar analysis of the participation data in the months before and after the announcement of Sun's acquisition by Oracle.

Results for event 1: Open sourcing of Java

The results of the quantitative analysis of forum participation before and after the announcement of open sourcing of Java by Sun reveal a significant difference in terms of both participation dimensions (see Figure 1): the average number of new forum users per day increased from 17.2 to 20.9 ($t=-2.05$; $p<.05$), the average number of discussion threads per day increased from 31.8 to 44.7 ($t=3.06$; $p<.01$), and the average number of messages posted per day increased from 196.8 to 310.1 ($t=-3.36$; $p<.01$). The number of discussion threads and the number of messages posted were highly correlated ($r=0.96$ before the announcement; $r=0.92$ after the announcement). The rumors of open sourcing had started appearing in the media as early as August 2006, which is reflected in the data as well.

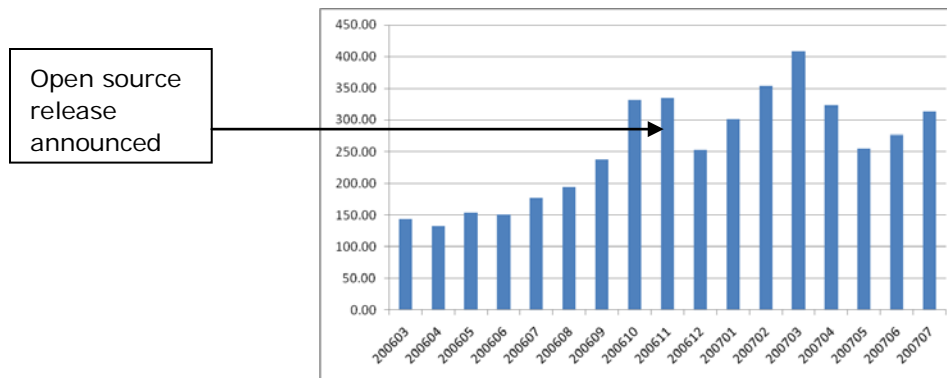


Figure 1: Number of messages posted on the forum in the months before and after Java was open sourced (11/2006)

Results for event 2: Acquisition of Sun by Oracle

The average number of new forum users per day dropped from 15.3 to 6.3 ($t=4.95$; $p<.001$), the

average number of discussion threads per day dropped from 33.1 to 15.1 ($t=4.60$; $p<.001$), and the average number of messages posted per day dropped from 260.9 to 128.0 ($t=5.22$; $p<.001$). It should be noted that the number of discussion threads and the number of messages posted are highly correlated ($r=0.98$ before the acquisition announcement, and $r=0.93$ after the announcement), as they are both facets of user interaction.

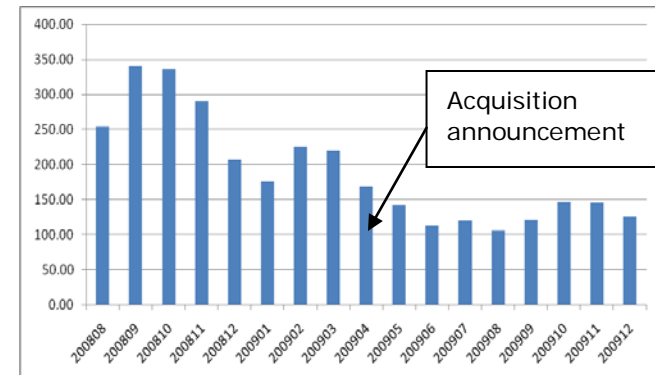


Figure 2: Number of messages posted in the months before and after the acquisition of Sun by Oracle (04/2009)

Discussion

Two possible motivational mechanisms through which environmental jolts affect participation may be at work: the first is pragmatic in nature: external jolts may lead users to reassess the relevance and potential benefit participation carries for them, and as a result, join, leave or change the intensity of participation; in line with [4], who suggested that ideological issues are a major factor in how people respond to environmental jolts, the second mechanism is more ideological in

"I think that open sourcing Java will mean very little for developers tomorrow. Very few are really that interested in doing anything with the source. But short term it will make Java much more acceptable in the open source community. Long term it adds credibility to Java. If something really bad happen to SUN, then Java would be out of reach for predators."

August 15 2006,

http://www.theserverside.com/news/thread.tss?thread_id=41760

Figure 3: User comments related to open sourcing of Java

"While Sun may not be the strongest FOSS advocate, they've made many adjustments over the past few years to open up several products. Is Oracle likely to have the same philosophies when it comes to this stuff? I don't know Oracle as an organization too well, but I have a feeling they'd go into 'lockdown' mode of Sun's projects if they bought 'em." – Anonymous Coward on Thursday

April 09 2009, @03:22PM

<http://developers.slashdot.org/comment.s.pl?sid=1194099&cid=27522341>

"Just hope that Oracle doesn't make all that hard work the FOSS community go to waste by making it proprietary. In that case, expect to see protests by both FOSS developers and leaders within the FOSS protest, like Richard Stallman."

Ungood++ Apr. 20th 2009

<http://arstechnica.com/civis/viewtopic.php?f=2&t=19810>

Figure 4: User comments related to Oracle's takeover of Sun

nature: users may be affected by the way they perceive the steward company and its values, and as a result change their participation pattern, regardless of any potential personal benefits (see [9] for another case).

The cases we present above also highlight the different directions of change – in one case participation increased and in the other case it decreased. We conjecture that the first mechanism may have led to increased participation because users may expect the open source software to become more pervasive over time, and therefore using Java, and learning more about it carries potential employability prospects (pragmatic motives). The second mechanism may have led users to decrease their participation, because the values associated with the new steward company may be perceived to be incongruent with the values of the old steward company, and with which users identified (ideological motives). Our reading of online forums lends credence to our argument (see figures 3 & 4 on the left). Further research may help to determine the extent to which these factors are at work. In particular, it is important to tease out factors that either increase or decrease participation to understand how their effects can be leveraged to grow a community or controlled to avoid a decrease in online participation and consequent death of the community.

Conclusion

We contribute to the growing CSCW body of knowledge on community participation by providing evidence of the effect of external events on such participation. Whereas prior work on online communities has focused on users motivations for participation and the design of communities to foster participation, the present study sheds light on the role of external events.

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