Perceived firm attributes and volunteers’ intrinsic motivation in sponsored open source software projects

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Background

- Firm sponsorship in OSS is increasing rapidly (Mehra et al. 2011)

- Despite significant investment from firms, a great number of sponsored OSS projects fail due to insufficient voluntary contributions (Fang & Neufeld 2009)

- Firm sponsorship provides extrinsic motivation through pay or career opportunities but dampens intrinsic motivation due to its for-profit nature and control over the project (e.g., Stewart & Gosain 2006)

- Why do we continue to observe a substantial number of volunteer participants in firm-sponsored projects?
Research Question

- Could certain aspects of a sponsoring firm have a positive impact on the intrinsic motivation of volunteers and, if so, how?

- Community-based credibility
  
  OSS developers’ perception of the sponsoring firm’s expertise and trustworthiness (Newell & Goldsmith 2001)

- Openness
  
  OSS developers’ perception of the sponsoring firm’s engagement in mutual knowledge exchange with the community (Jeppesen & Lakhani 2010)
Hypotheses

Building upon work motivation research (i.e., Colquitt et al. 2001) and recent development that views OSS as a social practice (von Krogh et al 2012), our central thesis is that when exhibiting credibility and openness, the sponsoring firm can play a more encouraging role in shaping volunteers’ intrinsic motivation than prior research assumes. These attributes exert their influence through reinforcing the volunteers’ social identification with the sponsored community.

H1: The perceived community-based credibility of a sponsoring firm has a direct positive effect on the intrinsic motivation of the volunteer participants.

H2: The perceived openness of a sponsoring firm has a direct positive effect on the intrinsic motivation of the volunteer participants.

H3: Social identification with the OSS community sponsored has a direct positive effect on the intrinsic motivation of the volunteer participants.

H4: The perceived community-based credibility of a sponsoring firm has an indirect positive effect on volunteer participants’ intrinsic motivation through their social identification with the community.

H5: The perceived openness of a sponsoring firm has an indirect positive effect on volunteer participants’ intrinsic motivation through their social identification with the community.
Method

- **Sample size**
  1151 voluntary developers in two firm-sponsored projects (Maemo, 368; OpenMoko, 783) responded to our Internet survey (with chances to win a tablet as incentive; response rate 28%)

- **Key measures**
  - Intrinsic motivation to contribute (5 items, developed based on Deci & Ryan 1985)
  - Community-based credibility (5 items, developed based on Newell & Goldsmith 2001)
  - Openness (5 items, based on Jeppesen & Lakhani 2010)
  - Social identification (Allen & Meyer 1990)
  - Participation: bug trackers and forum archival data

- **Analysis**
  Two-step approach (Anderson & Gerbing 1988) to evaluate the quality of the measurement and structural models using LISREL 9.1
## Method

<table>
<thead>
<tr>
<th>Construct</th>
<th>Description</th>
<th>Factor Loading</th>
<th>Composite Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrinsic motivation</strong></td>
<td>I contribute to the Maemo/OpenMoko community because I enjoy helping others.</td>
<td>.52***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I contribute to the Maemo/OpenMoko community because I enjoy working in this community.</td>
<td>.78***</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>I contribute to the Maemo/OpenMoko community because it is fun to contribute.</td>
<td>.65***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I contribute to the Maemo/OpenMoko community because I appreciate it if others value my contributions.</td>
<td>.45***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I contribute to the Maemo/OpenMoko community because I learn a lot participating in the community.</td>
<td>.61***</td>
<td></td>
</tr>
<tr>
<td><strong>Openness</strong></td>
<td>Nokia/OpenMoko publishes sufficient documentation.</td>
<td>.55***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I understand how the company makes decisions regarding the Maemo/OpenMoko project.</td>
<td>.62***</td>
<td>.73</td>
</tr>
<tr>
<td></td>
<td>My code contributions are taken up in the official software release.</td>
<td>.48***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I can get commit access for the project’s source code repository if I want to.</td>
<td>.46***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My opinion is sufficiently taken into account when the company makes decisions regarding the Maemo/OpenMoko project.</td>
<td>.65***</td>
<td></td>
</tr>
<tr>
<td><strong>Community-based credibility</strong></td>
<td>Nokia/OpenMoko’s employees working on the Maemo/OpenMoko project are technically skilled.</td>
<td>.52***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nokia/OpenMoko’s open source activities are well managed.</td>
<td>.64***</td>
<td>.81</td>
</tr>
<tr>
<td></td>
<td>Nokia/OpenMoko would be a good company to work for.</td>
<td>.63***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I trust Nokia/OpenMoko as a company.</td>
<td>.69***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nokia/OpenMoko supports the community.</td>
<td>.71***</td>
<td></td>
</tr>
</tbody>
</table>
Findings

Community-based Credibility

Openness

Social Identification

Intrinsic Motivation

Total active hours reported

Actual bug activities

Standardized path coefficients. *** p < .001; ** p < .01
## Findings

|                                | Standard coefficient | Standard error | z    | P > |z| |
|--------------------------------|----------------------|----------------|------|-----|------|
| **Total effect on intrinsic motivation** |                      |                |      |     |     |
| Community-based credibility     | .39                  | .06            | 6.49 | .00 |     |
| Openness                        | .08                  | .04            | 1.87 | .06 |     |
| **Direct effect on intrinsic motivation** |                      |                |      |     |     |
| Community-based credibility     | .27                  | .06            | 4.80 | .00 | ✓H1 |
| Openness                        | .04                  | .04            | 1.00 | .33 | ✗H2 |
| Social identification           | .21                  | .02            | 8.74 | .00 | ✓H3 |
| **Indirect effect on intrinsic motivation** |                      |                |      |     |     |
| Community-based credibility     | .13                  | .02            | 5.20 | .00 | ✓H4 |
| Openness                        | .04                  | .02            | 2.50 | .01 | ✓H5 |

H1 ✔

H2 ✗

H3 ✔

H4 ✔

H5 ✔
Implication

**Theoretical implications**

- Expand literature on participants’ motivation and OSS sponsorship (i.e. Shah 2006; Jo) by showing that firm sponsorship is not always a liability to intrinsic motivation
- Echo the conceptual conjectures of Alexy et al (2013) and West (2003), and empirically demonstrate that it is neither sufficient nor necessary to be unlimitedly open
- Spell out the mechanism of social practice in OSS (von Krogh et al 2012)

**Practical implications for firms seeking voluntary contributions**

- Develop a “selective opening” strategy
- Establish a “credible” image within the specific developer communities
- Build a tight-knit community
Reference

Discussion

- Your thoughts?
- Contact me at fhe@ethz.ch