

Chapter 12

The Influence of Open Source Software Volunteer Developers' Motivations and Attitudes on Intention to Contribute

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ABSTRACT

This study differs from previous studies on open source software (OSS) developer motivation by drawing upon theories of volunteerism and work motivation to investigate the motives and attitudes of OSS volunteer developers. The role of commitment is specifically interesting, which is well established in the volunteerism and work motivation literature as a predictor of turnover and positively related to work performance, but has been overlooked by OSS researchers. The authors have developed a research model relating motivations, commitment, satisfaction, and length of service to intention to contribute to OSS projects in the future. The research model is evaluated using data from an online survey of 181 OSS volunteer developers. The research results and more discussion of these areas of interest will be evaluated and discussed further in the chapter.

INTRODUCTION

Highly publicized corporate involvement in open source software (OSS) development creates the illusion that volunteers are no longer that important to OSS development anymore. OSS projects

such as Linux and Apache Web Server, which grew from seed planted by volunteers, are now commercialized and largely supported by business interests. These successes were followed by software donations by corporations to create new OSS projects. Sun Microsystems contributed OpenOffice, IBM open sourced Eclipse (toolkit for designing integrated development environments)

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and Lotus Symphony (document processing applications), and Netscape released its browser suite source code to start the Mozilla project, to name a few. As a result, many OSS developers are paid by information technology vendors, OSS foundations or companies that utilize OSS to work on OSS projects. Together, these observations support the image of a highly active, highly commercialized OSS development effort that no longer relies upon volunteers who are not paid to contribute, which we refer to as 'volunteers'.

Although prominent projects such as Linux and Apache Web Server are largely sustained by commercial interests, they still benefit from volunteerism. For example, it is estimated that 18 - 25% of new Linux code still comes from volunteers (Smoker, 2010). Other less prominent OSS projects rely substantially on volunteers. Debian, a Linux distribution package, and Sahana, information management solutions for disaster response, are just two examples of the many OSS projects that rely heavily on volunteers. Drupal (content management platform) is an example of an OSS project that uses a balanced mix of volunteer developers and paid contributors.

OSS projects recruit volunteers not just for raw manpower, but more importantly, because of their remarkable skills and knowledge. Fang and Neufeld (2009) reviewed several qualitative studies on OSS project success and concluded that a lack of sustained volunteer participation is a major reason for OSS project failure. Their own qualitative study of OSS volunteers reveals that repeat volunteers make special contributions by taking on advising roles and making practical contributions such as code improvement. Consequently, there is considerable practical advantage in understanding what directs and sustains OSS developers' voluntary participation for extended periods of time.

Motivation is what draws volunteers to OSS projects. Previous studies regarding OSS developers show a variety of evidence that different types

of motivations are important, but there is much less understanding of the relative importance of motivational components in different contexts (e.g., work satisfaction, performance, effort, recruitment, and retention) (Krishnamurthy, 2006). A second limitation of past research is that it mainly examined simple correlations between motivators and behavior, but research on motivational structure has shown that developers' motivations are not independent but rather are related in complex ways (Meyer et al., 2004; Roberts et al., 2006). Motivational structures need to be studied in order to better understand volunteer behavior. Thirdly, commitment, a distinguishable component of motivation, is neglected in research on OSS developers' motivation. Commitment is a predictor of employee turnover and positively related to work performance (Meyer et al., 2004). Finally, prior studies of OSS developers' motivations group volunteers and paid participants together for analysis. It is arguable that the motives of volunteers differ from those of paid participants as the involvement of volunteers is entirely discretionary.

Our work presented here advances understanding of OSS volunteerism by addressing the aforementioned limitations of past research. It investigates the role of commitment, which the work motivation literature maintains plays a key role in sustained discretionary involvement. The structural issue is addressed by adopting a comprehensive framework based specifically on goal setting, functional analysis of volunteerism and expectancy-valence theory (EVT). Functional analysis was chosen because goal-setting theory is arguably the dominant theory in the work motivation literature (Miner, 2003). EVT was chosen since it has been shown to be useful for capturing those motivational factors that are important to volunteers (Miller, 1985) and has been justified by prior research as an appropriate theory in the evaluation of OSS developer motivations (e.g., Hertel et al., 2003; Wu et al., 2007). And finally, the resulting research model is evaluated using

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