

Computing in a Virtual Organizational Culture: Open Software Communities as Occupational Subcultures

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Introduction

Open software projects have proliferated over the last decade starting with the development of operating systems such as Linux leading to the formation of esoteric communities. Recent open software groups include computer game developers; Internet/Web infrastructure developers; business applications; X-ray astronomers and deep space imaging professionals; and academic software development researchers. The term “open software” is used here to signify both open source code and other software products such as documentation, web sites, email archives, on-line chat logs, and bulletin board discussions. Proponents of open software hail its advantages such as improved software validity, simplification of collaboration, and reduced software acquisition costs. However, few empirical studies have been conducted to validate these and other claims. Research to date has focused on the quantitative side of open source development projects. More studies are needed using a socio-technical perspective to study the social circumstances surrounding the technical system configurations and virtual organizational contexts that comprise an open source project (Scacchi, 2001).

This study characterizes open source communities as occupational subcultures (Van Maanen and Barley, 1984; Trice and Beyer, 1985) with unique values, norms, and work practices using an organizational culture perspective (Martin, 2002; Schein, 1992). It is part of a larger study¹ of how open software communities build reliable software systems through the socio-technical work structures and processes they enact within their community of practice. This study focuses on the culture of open source computing and how it influences work practices associated with software development.

Research Design

A “community of practice” (COP) is a group of people who share similar goals, interests, beliefs, and value systems. Researchers use this term to investigate how groups of people work together and use information technology (IT). An alternative way of viewing groups with shared goals in

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organizations is to characterize them as organizational subcultures (Martin, 2002; Schein, 1992) or occupational communities (Van Maanen and Barley, 1984). An occupational community is a particular type of occupational subculture that forms from the intense occupational ties within the group. Like communities of practice, occupational subcultures share similar goals, work practices, beliefs, interests, and value systems. However, occupational subcultures are bound by an occupation's set of rules and code of ethics promoting formation of shared ideologies and cultural forms. Cultural beliefs and values are manifested in cultural forms such as work practices, stories, rituals, jargon, material artifacts, and electronic artifacts. In this paper, the community of open source developers is characterized as an occupational subculture. See (Elliott, 2002b) for a detailed discussion on the differences between communities of practice and occupational subcultures.

This study explores the influence of occupational subcultures on the software development of five open software communities:

1. Business application open software project managed and developed via Internet resources
2. The extension of software for networked computer games such as UNREAL
3. Internet/Web infrastructure
4. X-ray astronomy and deep space imaging
5. Academic software design research

In addition, the “virtual” organizational usability of each of these open software systems will be assessed. Are these systems being designed to “fit” with the occupational subcultures of open source developers and users? The work of (Elliott and Kling, 1998) in coining the term “organizational usability” for software systems will be extended to virtual organizations. Of particular interest in this study is how the open source system is designed to fit with the “virtual” organizational culture of the occupational community of open source developers.

Studies combining the organizational culture perspective with IT are rare. Researchers have theorized that an organizational culture perspective would be helpful in understanding IT development, but few have applied this to the workplace itself (Gregory, 1983; Elliott, 2000). In this study, we have a unique opportunity to depict open source developers as an occupational community. The results will contribute to the burgeoning field of open software development deepening an understanding of work processes that promote successful open software projects. For more detail regarding this study, see (Elliott, 2002a).

Work in Progress

The first phase of this research explores the “geek” culture of open source developers on the Business Open Systems (BOS) project - a business application. BOS is a fictitious term used to maintain the anonymity of the open source system being studied. BOS has been selected as the first case study because it provides a window into software development of an open source system with “open” Internet access to IRC logs, mailing lists and reports. Methods used in this study include the grounded theory approach combined with an organizational culture perspective outlined in (Martin, 2002). The culture is explored from three perspectives: 1) integration - assumes that the cultural beliefs and values are an integrating factor to the culture; 2)

differentiation - assumes that different beliefs and values are present in the culture, not all of the integrating nature; and 3) ambiguity - assumes that the culture is fluctuating and inconsistent in its values and beliefs. Data from the BOS website is being analyzed in the form of documents, IRC logs, and mailing list archives. BOS is an open source project whose output is a complete enterprise level business environment. Results from this study will depict the occupational subculture of BOS developers and will be used to leverage the analysis of the four open software communities.

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