Chapter 54
Taming of 'Openness' in Software Innovation Systems

Mehmet Gencer
Izmir University of Economics, Izmir, Turkey

Beyza Oba
Istanbul Bilgi University, Istanbul, Turkey

ABSTRACT

In large-scale open source software (OSS) innovation ecosystems that incorporate firms, a variety of measures are taken to tame the potentially chaotic activities and align the contributions of various participants with the strategic priorities of major stakeholders. Such taming rests on the dual desires of this emergent community of firms to unleash the innovation potential of OSS and to drive it to a certain direction, and it emerges in the form of various organizational activities. By drawing on a sample of large-scale OSS ecosystems, the authors discuss that methods employed for taming are isomorphic, and overview the emerging strategic pattern for establishing systems of innovation. This pattern involves a related set of practices to balance virtues of OSS community while introducing corporate discipline. In contrast to approaches such as open innovation, which favor isolated reasoning, they present a systemic and historical perspective to explain the continuum in emergence and establishment of strategic patterns.

INTRODUCTION

Collaborative innovation is becoming increasingly commonplace in many industries, ranging from biotechnology to computer hardware/software. Many organizations are struggling with volatility in consumer demands, stiff competition, and try to respond in a creative and agile manner to these market pressures. The consequences, as it appears, frequently involve seeking innovation beyond traditional locus of internal R&D departments. Accordingly, various organizations pursue bilateral or multilateral arrangements to actively cultivate inter-organizational networks of collaborative innovation.

For firms in volatile markets, acknowledging the need to reach out to networks is a first move that open up new challenges. Most of these firms have established practices and strategies based on closed

forms of innovation. Some others have experience with 'open innovation', which involves exchanges with other organizations (firms and research institutions), often using established forms of legally binding bilateral arrangements such as licensing. However, network types of organizing defy existing bilateral forms to enable their participants to get organized with one another easily. Firms intending to benefit from networked, collaborative, and open innovation face various challenges regarding how to reason about, interact with, and profit from the networks they are embedded within. Organization of these open innovation practices is a chaotic forefront of innovation, which demands organizational forms of its own, developed through ongoing trials and errors of its current adopters.

Among several other industries, software industry has been one in which attitudes towards collaborative innovation strategies are changing rapidly. It seems that 'adaptation' is replacing 'planning' as the fundamental principle of innovation in software technology development. Within this changing mindset, Open Source Software (OSS), once a marginal movement, is finding its way into mainstream inter-organizational innovation practice in the industry. OSS provides proven methodologies, which stimulate rapid software product evolution at the expense of process predictability (as opposed to the established practices of software engineering), and promote product interoperability which facilitate a more efficient coordination medium (Behlendorf, 1999; Benkler, 2005; Ritala, 2001). Leading players in the computing industry, such as IBM, Apple, and Google, actively cultivate open source innovation networks and/or use software technologies coming out of these networks as components in their key products or operations (West 2003).

However, despite the rhetoric of `openness' surrounding these practices, considerable effort is vested in to tame the `mess'. Within the multitude of often conflicting business agendas in a collaborative innovation system, each participant faces the dilemma of converting collaborative outcomes into competitive advantage. Accessing knowledge resources through networks overcomes rigidities of innovating in isolation (Jorde and Teece 1989; Ring and van de Ven 1994; Leonard-Barton 1992; von Hippel 2006). Yet, an organization expects some predictability, and would like to drive this distributed and emergent, rather than centralized and planned innovation process in a direction that makes sense for its own priorities. While `openness' in OSS is associated with unleashing the bottom-up innovation, blending and aligning it with a business strategy unavoidably faces the dilemma of re-leashing this innovative power so that it is manageable in a 'top-down' way and becomes useful `business-wise'.

In this exploratory study we examine how practices in OSS, which is a non-commercial community organized as "collaborative innovation model" (von Hippel and von Krogh 2003), blends into a hybrid innovation model of the emergent community of commercial firms who adopt these practices. The major theoretical concern of the paper is to explore how the collaboration of two distinct worlds (OSS/bazaar and firms/hierarchies) incrementally changes the established activities and lead to the transformation of a community. In this vein, we investigate six cases (Apache, Linux, Eclipse, Mozilla, GCC, Android) of 'community-led' and 'corporate-led' collaborative innovation projects based on OSS, and attempt to identify common patterns in structures and processes which address the above mentioned dilemma while empowering collaborative, open innovation. In explaining the transformation of the OSS practices, we utilize an activity-based model developed by Jarzabowski (2005). As shown in Figure 1, this approach incorporates actors, activities of actors, and the collective structures developed by the shared activities of involved actors. We define the two communities as activity systems comprising distributed actors, shared activities of these actors (recruiting, strategic decision making, licensing, leadership, and quality assurance) and collective structures (governance) developed during the pursuit of these shared activities. These activities are sites where interactions among actors are promoted and arise from their interactions

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