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Why would online gamers share their innovation-conducive knowledge in the online game user community? Integrating individual motivations and social capital perspectives

Yong Sauk Hau *, Young-Gul Kim [1]

College of Business School at KAIST, 87, Hoegrio, Dongdaemun-gu, Seoul 130-722, Republic of Korea

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ABSTRACT

The user community has been an important external source of a firm's product or service innovation. Users' innovation-conducive knowledge sharing enables the community to work as a vital source of innovation. But, traditional economic theories of innovation seem to provide few explanations about why such knowledge sharing takes place for free in the user community. Therefore, this study investigates what drives community users to freely share their innovation-conducive knowledge, using the theory of planned behavior. Based on an empirical analysis of the data from 1244 members of a South Korean online game user community, it reveals that intrinsic motivation, shared goals, and social trust are salient factors in promoting users' innovation-conducive knowledge sharing. Extrinsic motivation and social tie, however, were found to affect such sharing adversely, contingent upon whether a user is an innovator or a non-innovator. The study illustrates how social capital, in addition to individual motivations, forms and influences users' innovation-conducive knowledge sharing in the online gaming context.

1. Introduction

In the past, business innovations such as product or process innovations mostly took place within the boundaries of a firm. Recently, however, a new form of business innovation, *open innovation*, has been drawing attention from both academia and business circles. Open innovation opens up a firm's boundaries to identify and capture innovative external ideas and knowledge to create value beyond the firm's limited resources and capabilities (Chesbrough, 2006a,b). Procter&Gamble (P&G), for example, is well known for its open innovation strategy, *Connect and Develop*, where it actively pursues external expertise outside its own R&D department, resulting in a series of highly profitable innovations (Huston & Sakkab, 2006).

While P&G's open innovations have been based on collaborations with outside experts, another important stream of open innovation originates from a firm's customers (Arakji & Lang, 2007; Chesbrough, 2007; Füller, Mühlbacher, Matzler, & Jawecki, 2009). User innovation communities, for instance, have been one of the most important open innovation sources for firms (Prahalad & Ramaswamy, 2004). They enable companies to extract ideas and knowledge from their users to improve products or services in a cost-effective way (Linder, Jarvenpaa, & Davenport, 2003). Furthermore, user innovation communities are believed to be the strategic resource that cannot easily be imitated by competitors (Jeppesen & Frederiksen, 2006).

A phenomenon that defies traditional economic theories of innovation quite often takes place in user innovation communities: Users freely reveal their innovation-conducive knowledge, giving up potential benefits from such knowledge (Von Hippel, 2005, 2007; Von Hippel & Von Krogh, 2003). Despite the possible opportunities to gain intellectual property rights or other economic gains from their innovation-conducive knowledge, some users voluntarily share their knowledge with other interested members of their community for free. Von Hippel (2001) views the incentive to voluntarily reveal innovation-conducive knowledge as an important condition in the development of user innovation communities. However, the two prevalent models of innovation—the private investment model and the collective action model—do not sufficiently explain what makes users freely share their innovation-conducive knowledge (Von Hippel & Von Krogh, 2003). So, this study aims to find out significant factors that influence such knowledge sharing to deepen our understanding about important antecedents to free revealing of innovation-conducive knowledge that traditional economic perspectives cannot explain adequately. Furthermore, it has the purpose of sharpening our understanding about major factors on which practitioners should keep their eyes to successfully support innovation-conducive knowledge sharing in the user innovation communities for their products and services.

* Corresponding author. Tel.: +82 2 958 3598; fax: +82 2 958 3599.
E-mail addresses: Hau.Augustine@gmail.com (Y.S. Hau), ygkim@business.kaist.ac.kr (Y.-G. Kim).
[1] Tel.: +82 2 958 3614; fax: 82 2 958 3599.

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In the line with the research objectives of this study, this paper focuses on the factors that concern the voluntary, active sharing of innovation-conducive knowledge in a user innovation community. More specifically, we examine the following two research questions:

(1) How are individual motivations related to a user's sharing of innovation-conducive knowledge?
(2) How is a community's social capital associated with its user's sharing of innovation-conducive knowledge?

2. Insights into user innovation communities from existing literature

From existing literature, this section provides insights into the definitions and characterization of user innovation communities. It also sheds a light on the user innovation community as an important source of open innovation and the innovation-conducive knowledge sharing as the cornerstone of such community.

2.1. Definitions of the user innovation community

Von Hippel (2005) defined the user innovation community as "the nodes consisting of individuals or firms interconnected by information transfer links which may involve face-to-face, electronic, or other communications (p. 96)." Based on Pisano and Verganti (2008)'s classification of collaboration modes, a user innovation community is "a network where any user can propose problems, offer solutions and decide which solutions to use (p. 81)." According to Füller, Jawecki, and Mühlbacher (2007), a user innovation community is "where members actively discuss provided ideas, offer possible solutions, further elaborate and test them, or just give their opinion (p. 61)." These definitions emphasize two commonalities of any user innovation community: innovation-conducive knowledge sharing and a network based on user interactions. To focus on the innovation link between a firm and its user innovation community, we find it necessary to add one more contextual condition: the existence of an active collaborative relationship with the firm. Thus, in our study a user innovation community is defined as a network, in active collaboration with a firm, where users voluntarily and freely develop and share their innovation-conducive knowledge with other community members.

2.2. Characterization of user innovation communities

Our synthesis of the previous studies and field observations shows that user innovation communities have three dimensions of distinctive features: user participation (full versus partial), community system functionality (online versus offline), and the host (the firm versus a third party). In a fully participating community, users can participate in the firm's entire value chain process, from the innovation of the product or service to its distribution. For instance, users in an open source software community can produce, develop, and distribute software easily via the Internet, so they benefit directly from their innovation activities (Füller et al., 2007). On the contrary, in communities that treat physical goods, user participation is limited to innovation-conducive knowledge sharing or innovation activities (Franke & Shah, 2003). In such communities, the manufacturers, rather than the users, incorporate user innovation into the product or service and distribute it, and therefore users benefit indirectly from their innovation activities (Füller et al., 2007). Von Hippel (2001) underlines the importance of full user participation as a major condition for the development of a user innovation community.

In terms of community system functionality, online user innovation communities can provide convenient functions for their members (Von Hippel, 2005). Today's advancement of information and networking technology via the Internet makes it much easier for user innovation communities to offer online chat rooms, forums, and instant messenger services so that users can conveniently share their innovation-conducive knowledge. The cost of online user-to-user interaction is far less than offline, so users in online user innovation communities can share their innovation-conducive knowledge more efficiently than offline (Jeppesen & Frederiksen, 2006).

A user innovation community can be a strategic asset for a firm, but the firm may not have full control over the community if the community is operated by the users or a third party. In a firm-hosted user innovation community, however, when a user reveals his or her innovation-conducive knowledge to a firm's product or service platform, the hosting firm can easily capture such knowledge and integrate it into other users' innovation-conducive knowledge (Jeppesen & Frederiksen, 2006).

2.3. The user innovation community as an importance source of open innovation

Open innovation is "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively (Chesbrough, 2006b, p. 1)". As seen in Fig. 1, there is a big difference between the open and closed innovation paradigms. Closed innovation is internally focused logic, but open innovation combines internal and external ideas to create more value for the firm (Chesbrough, 2006a, 2006b). Companies pursuing open innovation strategies can take advantage of more diverse and useful knowledge sources for innovation than companies pursuing closed innovation strategies (Chesbrough, 2006a, 2006b, 2007). Cooperation with online user communities, universities, research institutes, ex-hackers, and so on, enables a firm to generate more innovative products and services than it would have been able to create on its own. The user innovation community belongs to one of the four basic modes of collaborative innovation suggested by Pisano and Verganti (2008) (see Fig. 2).

In an innovation community, such as the Linux open source software community, any user can join and share their innovation-conducive knowledge to improve the product or service of a firm (Pisano & Verganti, 2008). With the explosive growth of high speed internet and social networking services, the user innovation community is rapidly emerging as an important source of open innovation.

2.4. Innovation-conducive knowledge sharing as the cornerstone of the user innovation community

From a traditional economic point of view, user innovation communities may not exist, because firms have more economic incentives from innovations than users, and more resources for their rapid diffusion (Von Hippel, 2001). However, user innovation communities have existed for many years as an important source of innovation in various industries (Von Hippel, 2001), as shown in Table 1.

Users' innovation-conducive knowledge sharing behavior is what enables the user innovation community to function as a vital source of a firm's innovations (Franke & Shah, 2003; Füller et al., 2007; Jeppesen & Molin, 2003). In a user innovation community, users not only share their ideas, information, and knowledge about the firm's product and service, but also interact to improve them. Their interactions are intensified through their participation in online or offline community meetings. Franke and Shah (2003) find that, within a user innovation community, innovation is not the work of an individual but, rather, the result of members' joint