



Open innovation requires integrated competition-community ecosystems: Lessons learned from civic open innovation

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KEYWORDS

Open innovation;
Transforming government;
Ecosystems;
Public sector effectiveness;
Best management practices;
Hackathon;
Crowdsourcing

Abstract Open innovation has received substantial business attention as a means of providing firms in hyper-competitive environments with the ability to create a stream of new products and services. For open innovation, organizing external sources correctly is a critical capability; current literature suggests that external sources should be organized *either* as collaborative communities or as competitive markets. While firms have generally been slow to adopt open innovation, many cities in the U.S. and Europe have been quick to embrace it—providing needed field-based experience on how to organize external sources. Based on our examination of six cities opening their data for innovation, we found that while cities often started with one or the other approach to organizing their external sources, each approach was inadequate in ways that could potentially be addressed by the addition of the other approach. Thus, we conclude with an integrated approach in which the needs of the entire ecosystem of sources and supporters of innovation are organized to address *both* competitive and community needs.

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1. Open innovation: Competitive markets and collaborative communities

Open innovation has been defined as a strategy that uses “purposeful inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for the external use of innovation, respectively” (Chesbrough, 2003, p. 1). This strategy has been proposed as a way to develop innovative products beyond the internal capacity of the

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company, as firms recognize that great talent often resides outside of their employ (von Hippel, 2009). Additionally, literature considers the organization of external providers a critical capability for open innovation. Boudreau and Lakhani (2009) offer two alternative organizing approaches in their proposed framework: collaborative and competitive. When external innovators are organized into competitive markets, the profit motive of the players is emphasized, the relationships are governed by arm's length contracts, and there is little sharing among external participants. In contrast to competitive markets are collaborative communities. When external innovators are organized into collaborative communities, a range of extrinsic and intrinsic motives are emphasized, the relationships are informal, and there is substantial technology sharing. The authors argue that competitive markets are more appropriate with players that prefer extrinsic rewards and when the innovation problem is best solved by broad experimentation; the opposite conditions indicate the need for a community-based organization of external sources. Despite the attention given to open innovation in the business press, companies have struggled with how to manage the external providers of their innovations (Boudreau & Lakhani, 2009; Sieg, Wallin, & von Krogh, 2010). One sector that has embraced open innovation is the public sector, in which many cities have undertaken external innovation. These cities provide a wealth of experience in how to organize external sources. We used the Boudreau and Lakhani (2009) framework to study six of these. We found that while cities often started with either a competitive or a collaborative community approach to organizing their external sources, each approach was inadequate in ways that could potentially be addressed by the addition of the other. Thus, we conclude with the need for an integrated approach in which external sources of innovation are organized to address *both* competitive and community needs. Moreover, we find that organizing only the immediate sources—as has been recommended—is inadequate for effective open innovation, since the sustainability of a new idea requires support from a number of less innovative sources. Open innovation is likely to succeed only when the needs of the entire ecosystem of sources and supporters are organized in ways that foster both competition and collaboration.

2. Civic open innovation

One division that has embraced open innovation is the public sector (data.gov, smart-cities.eu). For example, on his first day in office, President Obama signed the Memorandum on Transparency and Open

Government with the aim to empower the public to influence decisions that affect their lives, track how government spends money, and reduce the influence of special interests (<http://www.whitehouse.gov/open/about>). The data catalog that was created—the most comprehensive at the time—included real-time crime feeds, school test scores, and demographic information by neighborhood. These 'open data' efforts were rapidly replicated in the UK, translated to many European cities and governments, and resulted in the Public Sector Information Directive of the European Parliament in 2013. Open innovation in the public sector is often driven by multiple motives, only one of which is a cost-reduction (i.e., profit) motive. Other motives include increasing citizen involvement in decision-making, bringing improved services to the public, and improving economic opportunities for citizens (data.gov, newurbanmechanics.org, open-data.europe.eu).

Many cities have publicized their open innovation efforts. We studied in depth six cities—Barcelona, Amsterdam, Helsinki, Boston, Philadelphia, and New York—that had been involved in open innovation activities for at least 4 years, in order to determine how the cities managed their external innovation sources. Semi-structured interviews were conducted to understand the types of software applications that were created as a result of the open data/open innovation initiative in each city, the success and usage of the software applications, and how city managers organized actors involved in the initiative. Individuals interviewed included chief technology officers, open data managers, and policy makers at each of the cities, as well as application developers, commercial open innovation intermediaries, open innovation platform developers, startups resulting from developed applications, and companies using the open data and applications. In total, 52 interviews were conducted. We also examined a range of secondary sources to validate the interview data, and attended conferences to identify the latest practices and trends. The six cases are briefly described in Table 1.

3. Finding #1: Multiple approaches for civic open innovation

We identified several approaches cities used for open innovation. Some of the approaches fostered collaborative communities—informal relationships, technology sharing, and a range of intrinsic and extrinsic motivations. Other approaches encouraged competitive markets—more contractual relationships, stronger profit motives, and less sharing among

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