Modes of open innovation in ecosystems: Exploring for Managerial Playbook

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Abstract: The paper explores how open innovation manifests in the innovation ecosystems. The empirical data was collected through 35 in-depth interviews and three round table discussions in 13 innovation ecosystems. The findings suggest that resource sharing and integration takes predominantly place in dyadic relationships in individual innovation projects. Only new project ideas are brainstormed at the ecosystem level. One clear reason seems to be lack of open innovation tradition in companies. Thus innovation ecosystems appear to act more as innovation project boosters than promoters of open innovation activities, which seems to be the task of individual projects. This highlights the importance of open innovation facilitation in innovation ecosystems and creation of collaborative capabilities among the participants.

Keywords: ecosystems; innovation ecosystems; innovation networks; open innovation; value co-creation.

1 Introduction

In various industries, innovation increasingly involves technological complexity and market uncertainty (Herskovits et al., 2013). Instead of providing value with individual products and services, value propositions in this kind of environment call for several actors who create value in interaction (Xie and Wang, 2020). These changes have made organisations to find new ways to pursue innovation and led to building of innovation ecosystems (Letaifa, 2014). Open innovation is suggested to enable collaboration in innovation and promote resource integration (Xie and Wang, 2020).

Open innovation, however, may cause various challenges and costs to the participants. It can open the possibilities to opportunistic exploitation of the resources of others (Dahlander and Gann, 2010). Open innovation further causes transaction costs for coordinating, managing and controlling the activities in innovation ecosystems (Becker and Dietz, 2004).

Existing literature, however, provide little evidence about how open innovation is pursued in ecosystems with multiple parties involved, and how it can be managed (Gomes et al., 2018; Xie and Wang, 2020).

2 Literature review

Walrave et al**.** (2018) define an innovation ecosystem as "a network of interdependent actors who combine specialized yet complementary resources and capabilities in seeking to co-create and deliver an overarching value proposition to end users, and to appropriate the gains received in the process". This proposes that an innovation ecosystem does not evolve by coincidence but is designed, i.e., purposive (Gobble, 2014; Oh et al., 2016), and needs governance (Oh et al., 2016).

As the purpose of an innovation ecosystems is to co-create value between the participants (Thomas, 2013), building a successful innovation ecosystem calls for understanding the logic behind value creation and capture (Scaringella and Radziwon, 2018). Unlike in traditional value chains, ecosystemic value creation and capture take place on multiple levels (i.e., organisation level and inter-organisational level) and by a variety of actors (Letaifa, 2014), comprising of developer companies, research organizations, end-users, competitors, complementors and institutional actors (Aarikka-Stenroos and Ritala, 2017). Actors join the innovation ecosystem if they find that it provides an opportunity to capture value for themselves. Commitment to the ecosystem further requires that the actors perceive they capture a fair share of value (Talmar et al., 2018).

Characteristic to innovation ecosystems is that they are dynamic networks, with relationships built on trust and collaboration for the purpose of value co-creation (Gobble, 2014). Value co-creation manifests itself only when the actors collaborate broadly and intensively (Drechsler and Natter, 2012) to develop new solutions, technologies, or business models that benefit all of them. Thus, continuous interaction between the actors is inherent in an innovation ecosystem, causing its evolution and transformation (Letaifa, 2014).

In order to increase the degree of collaboration in innovation ecosystems, open innovation is emphasized. It has been said to help in filling resource gaps, accelerating the innovation process, and increasing commercial success of launched offerings (Traitler et al., 2011). Originally open innovation has been defined as "the use of purposive inflows and outflows of knowledge to accelerate firm internal innovation" (Chesbrough and Bogers, 2014). Later the concept has evolved to refer to higher degree of collaboration. A recent definition characterises open innovation as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model" (Chesbrough and Bogers, 2014; West and Bogers, 2017).

Xie and Wang (2020) define an open innovation ecosystem as "an innovation ecosystem where a substantial number of the supported activities are classified as open innovation initiatives". Open innovation necessitates that partners are willing to share their resources (Drechsler and Natter, 2012). This requires orchestrating multiple actors across the innovation process. The importance of open innovation ecosystems is

increasing, which calls for skills to design and manage these kind of innovation constellations (Chesbrough, 2017).

According to Letaifa (2014), creation of the innovation ecosystem can be successful only if ecosystem members are willing to abandon their traditional competitive mindsets and move to more social and ecosystemic behaviors. Letaifa found three key factors that are needed for successful ecosystem creation: a vision, leadership, and social community building. These factors highlight the need to focus on community level in ecosystem management rather than on firm level. They also call for a legitimate coordinator who steers the ecosystem.

Value co-creation can only take place in social interaction, and it is inherently a social process. Based on the above key factors, Letaifa (2014) suggests some measures that would allow for increased value co-creation between various actors in an ecosystem: fostering ecosystemic mindset; and building a sustainable social community with collaborative capabilities. Collaboration is more intense when actors feel they can trust the others; when they feel they belong to the community; and when they establish interpersonal ties with other actors in the ecosystem. An innovation ecosystem is dependent on the application of resources, e.g., knowhow and skills of the participants. Therefore, it should foster the ability and the willingness of participants to share and integrate their resources and to co-create value. Collaborative capabilities development enables capturing, and exploitation of innovation opportunities in ecosystems. Collaborative capabilities are thus developed in order to enable collaborative resource integration. Open innovation ecosystem building may, however, be challenging since various interests need to be balanced (Musiolik et al., 2018).

The awareness of common good is more than agreeing on to collaborate with other parties in the ecosystem. Besides having the norms of behaviour and the common goals in collaboration, there needs to be a common understanding of the logic of value as well. Ecosystem members need to understand what kind of value and how they should co-create, and how this value is shared among the participants. This common understanding of value co-creation then leads to collective identity that is embedded in the shared logic. The ecosystem leaders have an important role in supporting the emergence of collective identity by their actions (Gawer & Phillips, forthcoming).

3 Research question and methodology

Current literature suggests that open innovation develops under conditions of technological complexity and market uncertainty (Herskovits et al., 2013). The purpose of this paper is to explore, how open innovation currently manifests in innovation ecosystems? Our aim is to provide new understanding on the possibilities to manage the open innovation process in ecosystems with multiple participants involved.

The research is exploratory in nature, and, therefore, a qualitative case study methodology with in-depth interviews was applied. Interviews were conducted in 13 innovation ecosystems in Finland, Sweden and Belgium between October 2019 and April 2020. Altogether 35 individual theme interviews and three round table discussions, each comprising of members of one innovation ecosystem, were conducted. We have interviewed the leaders and facilitators/coordinators of ecosystems, developer firms, universities and research institutes, and ecosystem consulting companies. Each interview lasted around one hour. All the interviews were recorded and transcribed verbatim.

The interview data analysis followed the thematic analysis method and was made with NVivo12 qualitative data analysis software. The variety of informants' roles in innovation ecosystems enabled complementary viewpoints adopted in data analysis.

4 Findings

The findings from the 13 innovation ecosystems revealed that open innovation activities that take place at the ecosystem level, typically refer to finding together new ideas for innovation projects. The findings further provide evidence that innovation ecosystems are important communities in making people meet others and find common interests for innovation collaboration. The coordinator of one of the ecosystems put it this way: "The aim of this ecosystem is to make people discuss, meet and get to know others. We try to provide opportunities to brainstorming and then advance the ideas into innovation projects". Similarly, the manager of another ecosystem described this: "We have brainstorming meetings between the members, and then they come up with new ideas and we try to combine different insights from different parties. And most of our projects are created in that way, bottom up".

Besides arranged meetings, innovation ecosystem management highlights unofficial interaction among the actors as the means to find some new ideas. The manager of one ecosystem stated: "The most important part are all the unofficial day-to-day interactions that happen between our company people and people in the ecosystem". The manager of another ecosystem shared the view of the importance of unofficial interaction between the ecosystem parties: "Many projects that the members have started to develop, have not originated from our official Skype meetings, but from unofficial meetings".

Open innovation activities mainly take place in individual innovation projects inside the ecosystem. Typically, the projects are further divided into work packages. The findings suggest that open innovation, i.e., resource sharing and integration between the actors, predominantly takes place among the parties of single work packages. Dyadic relationships appeared to be common in resource sharing and integration. The leader of one ecosystem explained this: "Typically this kind of a project has six to seven work packages. And they have their own meetings. Work packages are formed by considering which partners share the same theme in the project". A company participating in the innovation projects under the same ecosystem described the challenge of collaborating between more parties: "If many actors are involved, it easily remains on very abstract level. But when only a few actors collaborate, it is easier to agree on things and work gets done". Characteristic to innovation ecosystems seem to be that collaboration can take place also with partners outside the innovation projects. The ecosystem leader noted: "Every project partner has also subcontractors. There can be a large amount of subcontractor firms or projects involved. They perform the things partners don't do themselves".

One way to enhance resource sharing at innovation ecosystem level are digital tools where project material is stored and where everybody can access them. The project manager of one of the ecosystems told: "We created a common page where all the parties had access to. And all material that was produced by each team was stored there". Some ecosystems also utilize digital collaboration tools. One ecosystem leader explained this: "We have a project going on where we try to bring new, more efficient digital tools for collaboration purposes. We test a platform where we could start new projects and conceptualize them, and possibly network also with other ecosystems".

Project information is similarly disseminated in various events and seminars that the innovation ecosystems arrange to their members, and possibly also to wider community. The leader of one ecosystem stated: "We also have twice a year a day when the hub firms present to our people what they do". Ecosystems also arrange workshops where the idea is to increase collaboration between the parties. The leader of another ecosystem told: "We have the running projects, but in addition we have in total 10 events a year, and six or seven of them are workshops where we put some emphasis on collaboration". One

ecosystem had started to use agile methods at one point, as explained by the ecosystem manager: “The events were typically built so that first day we had a key note speaker and then every partner presented what they had achieved in the last quarter of the year. Next day we decided together what we are going to do in next three months. Participants were self-steering and they formed always new sub-projects”.

5 Conclusions

The aim of this paper was to explore, how open innovation currently manifests in innovation ecosystems. The findings of the empirical study we conducted in 13 innovation ecosystems indicate that resource sharing and integration takes predominantly place in dyadic relationships in the individual innovation projects. This suggests that open innovation is used for inflows and outflows of knowledge to accelerate firm internal innovation (Chesbrough and Bogers, 2014) in innovation ecosystems. Open innovation seems to take place at the ecosystem level only, when new innovation project ideas are sought for. Thus innovation ecosystems appear to act more as innovation project boosters than promoters of open innovation activities, which seems to be the task of individual projects. One reason for this appeared to be that few actors have used to work in open innovation mode. This highlights the importance of open innovation facilitation in innovation ecosystems and creation of collaborative capabilities as suggested by Letaifa (2014).

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