TOWARDS AN UNDERSTANDING OF OPEN INNOVATION ECOSYSTEMS DYNAMICS: THE CASE OF MONTREAL NEW TECH

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Summary:

By observing the Montreal region's innovation ecosystem, this research paper presents a study case that aims to understand the main success factors for open innovation ecosystems (Chesbrough, 2003; Grandstrand & Holgersson, 2020). According to our research, thriving open innovation ecosystems require community-building platforms to articulate their main components (Actors, artifacts, and activities). Within Montreal's innovation ecosystem, we can observe umbrella organizations' emerging role, like Montreal New Tech, articulating and enlarging the existing innovation platform. This paper analyses the role of these collaboration catalyzers to understand their impact on the innovation ecosystems better.

Introduction and Definitions:

During the 1980s, technology companies faced a rapidly evolving technology landscape and found it increasingly beneficial to collaborate and share knowledge (Allen, 1983). Collaboration schemes could be formal or informal, but they were limited to physical interactions between experts and organizations. Geographic and cognitive proximity expanded or limited the scope of these collaborations. Currently, partnership for innovation aims to solve particular deficiencies among the actors who participate in it and respond more to cognitive proximity than to physical closeness. For example, startups are often self-sufficient during the initial stages of the innovation process, but they collaborate with incumbent companies for production and marketing. In turn, incumbent companies benefit from new ideas emerging in startups to develop novelty, so they often work together with them during the R & D process (Colombo, et al., 2006).

The growing need for customization in products further imposed the idea of collaborative innovation and took it beyond the community of experts. Over the past ten years, innovation has found much value in collaborating with product users to improve novelty and value chains. In many industries, such as video gaming, users became the source of new products (Green et al., 2015). Collaboration with users provides the potential for quicker and cheaper development of products and services, and produces a higher volume of innovation, provides access to customer's tacit knowledge (Selden & McMillan, 2006) and stronger customer lock-in (Vandermerwe, 2000). Because of pressures for quicker innovation, firms often view collaboration as essential for survival.

The open innovation (OI) framework proposed by Chesbrough encourages organizations to overcome the innovation model based on internal processes and invites them to expand beyond the organization's limits, in "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2003). According to Chesbrough, organizations can initiate R&D processes internally. This is considered desirable since it makes it easier to ensure that innovation's objectives remain aligned with those of the organization. However, every internal process of innovation reaches a point where the generation of knowledge reaches its limits and loses efficiency. This is when the company should choose to open processes to collaborate with other actors.

Consequently, OI can be understood as "a distributed innovation process based on purposely managed knowledge flows across organizational boundaries" (Chesbrough & Bogers, 2014). OI involves many other actors that fall far outside traditional supply chains (such as universities or individuals). These participants can be influenced, but often are not directed or managed. Some claim it is user innovation. It is not. The user is undoubtedly significant to open innovation, but so are universities, startups, corporate R&D, and venture capital.

Canada's innovation ecosystem

Traditionally, Canada's innovation ecosystem dynamics are understood as a linear relationship between government agencies, institutions of higher education, the private sector and global markets (Church, 2016). The role of government agencies is that of funders and regulators, educational institutions as creators of knowledge applications, the private sector as the main actor in the production and commercialization of goods, and global markets as consumers of innovation.

In recent years, we have seen that innovation is not limited to technological improvements (Fagerberg, 2018). Users, the public sector, and citizens, for example, are valuable assets to spur innovation, particularly when solving complex problems that have applications in the social sphere. These dynamics in innovation processes are not linear and benefit from including actors outside the traditionally described (Linder, et al., 2016). The academic debate on innovation policy impact is shifting towards the development of impact indicators, such as how much an innovation contributes to solving complex problems, such as climate change. It considers fewer and fewer indicators that only measure the results in the number of patents or jobs created, among others (Mazzucato, 2017).

The public innovation system's dynamic capacities to solve 21st-century problems must go beyond the traditional debate. This new vision points towards a new generation of innovation policies based on the logic of "distributed agency," including international organizations, civil society, ordinary citizen users, among others (Kuhlmann, 2018). They should not limit design mechanisms to solving market problems; instead of measuring their success in terms of results, they should focus on measuring their impact (solving real problems) (Rainer & Mazzucato, 2018). Today's complex challenges require a more extensive diversity of expertise, skills, and knowledge than those traditionally described.

Open innovation technologies and the creation of public value through interactions

OI approaches extend the frontiers of scientific knowledge development, inventive capacity, and technological production. Innovation has, to some extent, always been open. This section addresses the creation of public value for innovations by increasing interactions. The success of innovations in the Information Society context goes beyond technological development, and it depends more on their ability to solve complex, real-world problems.

The value that Information Technology (IT) creates in government is related to building public value. Just as managers in the private sector seek to create value in their companies, public managers must strive for public value creation. IT resources in public organizations can enable public managers to advance public-value frontiers by cultivating the following five organizational capabilities (Pang & Lee, 2014):

- Public service delivery
- Public engagement
- Co-production
- Resource-building
- Public-sector innovation

An open innovation platform must have the ability to create value in all five dimensions. By combining them, a creative dynamic of solutions arises that includes an additional element of value: they incorporate broader visions, thus becoming more applicable in real life. The challenge is to create an ecosystem where these interactions add as much public value as possible in the most efficient way.

Generally, digital ecosystems (DE) tend to create their inertias since they assume different dynamics than physical ecosystems (PE) and offer other benefits too. The ability to successfully replicate PE interactions and in-place incentives in a DE is one of the most critical challenges when designing a platform (Briscoe, 2010). The root of this problem lies in the very nature of both. Unlike PEs, which are characterized by more fluid and organic dynamics, the construction of the DE requires a technical dimension based on the use of standards, protocols, and mechanisms to transfer and process information (Jansen & Cusumano, 2012). This characteristic makes digital ecosystems more rigid and static. Therefore, it limits their ability to adapt to their members' interaction needs and, therefore, their early evolution to more complex interactions. Any design error, even those that result from omission, imposes high costs on the added value that the digital ecosystem can generate since such design errors may limit users to a certain number of interactions, which could be far fewer than they need (Li et. al., 2012).

Open digital platforms provide the best options for resolving the dilemma between rigidity and adaptability to create DEs that aim to increase collaboration. Providing for the highest level of appropriation of technologies and processes, beyond just providing access to the platform, allows for more organic DEs. Even though this implies losing control of the platform, this design favours collaboration and innovation.

Research Methodology:

This research paper aims to understand the Montréal Open Innovation Ecosystem dynamics from two perspectives. The first approach comes from a database that maps the ecosystem above. The database comprehends information over 480 startups, 28 incubators and accelerators, 116 different communities, and diverse funding sources. The second dimension of analysis comes from conducting over 35 semi-structured interviews oriented to understand network interactions. Among the interviewed were founders, managers, researchers, students, and government agencies.

About Montreal New Tech

Montréal NewTech (MTLNewTech) is a non-profit organization dedicated to the success of technological innovation and entrepreneurship in Montréal. The group hosts meetings that foster entrepreneurs' creative collisions and provides essential support for startups from the conception of an idea to its commercialization phase. Montréal NewTech has been propelling Montréal's startup community since 2008. Their main organizational goals are oriented to create trust and catalyze collaboration in the ecosystem. The meetings, startup demo nights, hackathons, workshops, etc., bring together thousands of entrepreneurs, professionals, students, developers, engineers, and designers to explore, experiment, and execute new technology projects every year.

They have created several communication channels for this community: its website, a Facebook group, a collaborative calendar, and a newsletter. Montreal New Tech's community is composed of more than 8000 entrepreneurs, intrapreneurs and technophiles in Montreal.

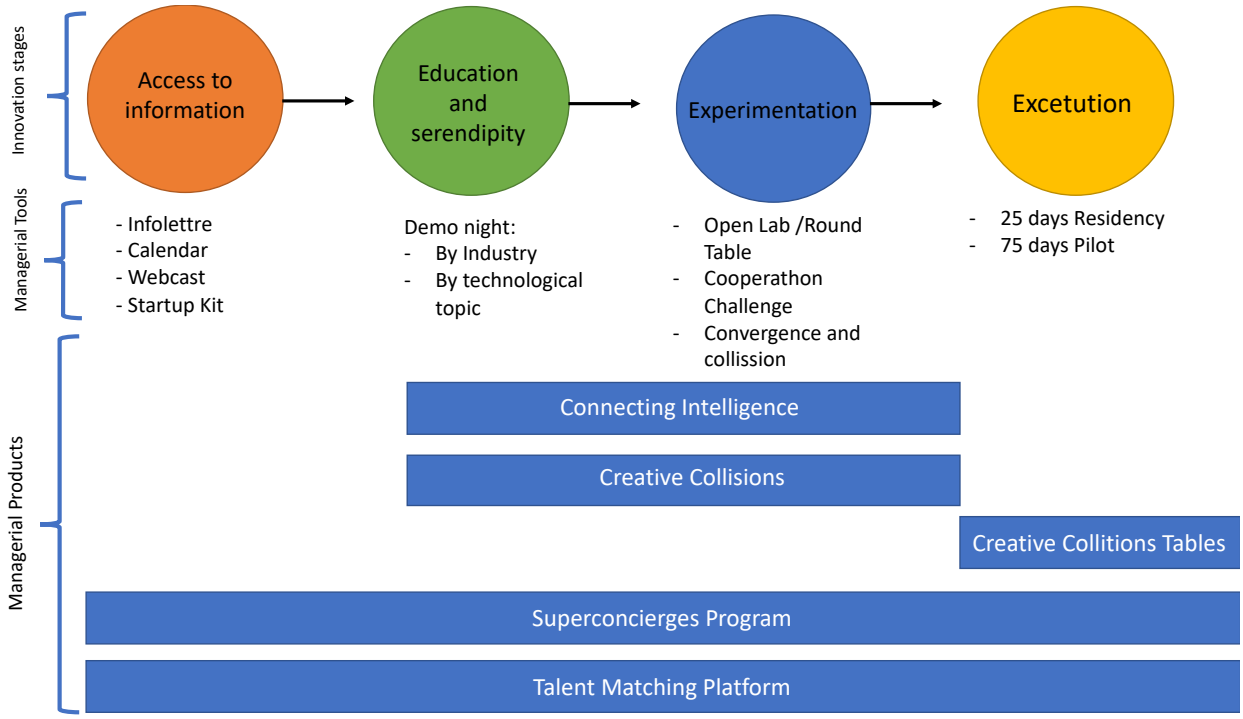
The organization brings together a community of innovation and technology enthusiasts who firmly believe that through generosity and collaboration within the Montreal ecosystem and beyond that ambitious innovations can be brought to help the digital transformation of businesses, the sustainability of entrepreneurs, and the sustainable advancement of our society. In particular, since 2014, the organization has focused on three tenets:

1. Bringing more science and technology into entrepreneurship,
2. Breaking down silos and barriers between communities of practice and increasing diversity and inclusion in the startup world, and,
3. Facilitate the commercialization of startups through creative collisions and open innovation.

This has led the organization to organize large-scale meetings to inspire ethical commercialization of research and encourage minorities to undertake and large companies to get closer to them.

Montréal NewTech has also been the instigator and facilitator of several business relationships between startups and larger companies and a partner in the early days of the Desjardins Lab, notably for the following successful programs: Data Cup; Coopérathon; Impact Startup; as well as Startup en Résidence.

Table 1: Montreal New Tech’s Open Innovation Ecosystem Management Model



Source: Own Elaboration with information from Montreal New Tech

Towards platforms supporting demand-side innovation

Open platforms for innovation can naturally help get closer to optimal allocative efficiency, thus resolving some market failures, especially those associated with increasing competition in the market of ideas, information asymmetries, and reducing entry barriers. Depending on the user's appropriation, these technologies can adapt themselves quickly to changing demands on the ecosystem, thus, solving those market failures associated with rapid changes in decision-maker preferences.

Based on the cases reviewed, we can conclude that a federal innovation platform can address innovation market failures by facilitating three concrete interactions (Terwiesch et al., 2008):

1. Collaboration: By effectively connecting experts and stakeholders, it accelerates collaboration and reduces information asymmetries.
2. Competition: Public challenges to find the best solution create more competitive offers and reduce the searching cost.
3. Transactions: Allowing actors to conclude a transaction in the same place that previous interactions occurred increases its value from a user's perspective.

The technological solution design will focus on these three dimensions, as appropriate to the Canadian context. The solution's capacity to create public value depends on its ability to include as many relevant actors as possible efficiently.

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