Building innovation ecosystems in cities and regions: People, capital, knowledge, and the local commons

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What was your key research question and what is your major finding from the research?

This research project was articulated around the following questions:

- What are the economic, technological and societal factors driving the creation of innovative and competitive digital ecosystems in Canada?
- To what extent can policy measures succeed in transforming cities or regions into sustainable magnets/generators of human talent, capital investments and knowledge assets?

To answer these questions, we have built on and from the results of our previous research on the video game industry (particularly in Montreal), which we view as an ongoing experiment from which lessons can be derived in the building of future digital ecosystems in Canada.

What we have suggested with our past research is that the essence of innovation dynamics in cities or regions lies in the articulation between "formal" actors or entities of the economy (firms, research centers, administrative units, etc.) and the myriad of "informal" actors or entities embedded locally (small informal collectives, diverse communities, techno-geeks, etc.), who, together, carry these dynamics by favoring the multiplication of both top-down and bottom-up initiatives. This enables formal structures to tap into the informal as well as to challenge and nurture the informal activities, while also enabling the informal grassroots endeavors to reach out to formal entities and logics, thus driving the circulation of new ideas from and to the market.

What we wish to emphasize with this particular work is that the innovation ecosystem out of which these top-down and bottom-up dynamics emerge is strongly related to the construction of "local commons", viewed as an "invisible" reservoir of locally-embedded and shared resources or assets, linking and facilitating interactions or joint initiatives between the ecosystem's constituents, and out of which a range of positive externalities – or spillovers – will be expected to blossom.

Broadly speaking, the commons are quasi-common goods, which allow collective learning. They comprise the people, the capital and the knowledge that are incidentally accumulated and combined within the ecosystem in the course of its natural life cycle, and that are further made available and accessible to the ecosystem's constituents. The idea is that the evolving articulation of people, capital and knowledge will be expected to enforce learning dynamics over time, and therefore will be expected to be cumulative and path-dependent. More precisely, we have advocated in our analysis that the local commons are composed of both a pool of common resources (resource endowments of basic scientific knowledge, pool of artistic or scientific talents, financial support to common infrastructure, etc.) and a dense middleground (common cognitive mechanisms such as places, spaces, projects and events) that connects the underground with the upperground. Not only does the pool of common resources and the middleground coexist, they also tend to cross-fertilize: a rich middleground contributes to increase the common pool of resources, and reciprocally.

By contributing (implicitly and explicitly) to the commons, the formal companies and their suppliers, the informal groups and collectives, along with public local authorities contribute to develop their collective

capacity to innovate, and, as an extension, build and reinforce the ecosystem of which they are part of. They thus bring value to the collective beyond the value created by each individual actor or entity.

What do your research findings mean for our understanding of Canada's digital opportunity?

The intricate relation existing between an ecosystem and its commons is of main concern in understanding how innovation dynamics unfold in a city or region. That is to say that the strength of an ecosystem and the key to its growth and development lie in and stem from the creation and maintenance of rich commons, which, by generating a variety of economic externalities (such as new ideas, new products or services, new processes, new ventures, and so on), are expected to act as important sources of innovation for the collective.

According to this perspective, the ecosystem and the commons co-evolve with one another, with the former characterizing the latter, and vice-versa. This means that the more actors and linkages present in the ecosystem and the larger their production – i.e. the bigger the ecosystem's scale –, the greater the (expected) commons, and hence the greater the (expected) externalities and the applications generated out of the commons. In a similar way, the more diversified the actors and linkages of an ecosystem and the broader their production – i.e. the bigger the ecosystem's scope –, the broader the (expected) commons, and hence the broader the (expected) externalities and the applications generated out of the commons. The scale of an ecosystem characterizes the ecosystem's capacity to attract new actors with similar and/or complementary roles, and to enable them to build new connections in the field, industry or sector in which the ecosystem specializes. The scope of an ecosystem characterizes the ecosystem's capacity to attract new actors from seemingly unrelated fields, industries or sectors, and to enable them to build new connections with each other as well as with incumbent actors.

What is key in this framework is that the dynamics of innovation rely as much on the accumulation of new and existing resources or assets as they do on the combination of these resources or assets. This favors the densification of relations within the ecosystem, and further favors the endogenous creation of externalities out of the commons, thus enabling the ecosystem to develop itself over time.

In our view, the commons should be expected to influence the ecosystem's structure, just as the ecosystem's structure should be expected to influence the creation of the commons. What the latter concept offers, therefore, as opposed to other theoretical constructs, is a self-building and self-sustaining apparatus driving the local dynamics of innovation within the ecosystem and enabling it to regenerate itself over time. With the commons, the ecosystem benefits from an ever-evolving pool of talent, capital and knowledge, which is continuously explored and exploited by the multiple actors or entities embedded locally, and thus kept organically alive.

Three major characteristics of an ecosystem emerge from the heterogeneous works on the subject: its generativity, its resilience and its power of attraction.

Generativity can be defined as the ability of a technology platform or technology ecosystem to create, generate or produce new output, structure or behavior driven by large, varied, and uncoordinated small collectives.

A resilient ecosystem is one that can react to adversity (unexpected events, crisis, etc.) and evolve in response to the new complex environment. This means that not only can the ecosystem manage crises effectively (adaptive capacity), but in the case of a major harm or destruction of some of its (formal) components, these formal entities may also return to an informal state (for instance, communities or informal groups of former employees) before potential transformation into new viable formal entities. In these regards, the existence of a rich and diversified common pool of knowledge resources, shared between the formal bodies and informal members, plays a major role in the level of resilience of an ecosystem.

The power of attraction stems from the fact that dense interactions between the different heterogeneous stakeholders of an ecosystem might exert a strong power of attraction on external newcomers that may contribute to enrich the ecosystem and increase its innovative potential. Beyond the richness and diversity of its knowledge bases, the power of attraction of an ecosystem can be linked to the effects of "buzz" in a specific industry and to the frequency and vibrancy of "events" that make visible the density of stimulating knowledge exchange and creation in a specific field and/or territory.

What are the key policy implications that flow from your findings?

Because of the characteristics and collective dynamics on which innovation ecosystems are based, policies in support of ecosystem building should primarily be aimed at enlivening/nourishing the commons. That is to say that, for a vibrant ecosystem to emerge, traditional support (essentially aimed at fixing actor and/or system failures) should be complemented by policy measures and instruments targeting the creation and maintenance of the commons, and thus aiming the provision and access to people, capital, and knowledge for all the ecosystem and its constituents.

The underlying assumption justifying this type of intervention is that the commons are again seen as the main drivers of innovation that may add to, and, in some cases, outperform their private or public alternatives, but that, too often, suffer from low levels of engagement and low levels of sharing.

Drawing more specifically on our previous work, we propose two ways in which the local commons may be reinforced:

- By organizing (permanent and temporary) places and/or spaces, where the formal and informal actors or entities can meet and interact (examples of these policy interventions could come through the organization of and support to fab labs, living labs, open labs, maker spaces, hacker spaces, and so on).

- By coordinating (general and specific) projects and/or events, which will simultaneously involve formal and informal actors or entities, and which will enable each layer to reach into or tap into the other (examples of these policy interventions could come through the organization of and support to contests, tournaments, competitions, challenges, workshops, festivals, trade-shows, and so on).

Innovation policy has historically been used to provide incentives to invest in R&D and/or to promote the collective organization of R&D. But with the rise of the ecosystem framework, more emphasis should be put on the articulation of different actors and worlds, rather than on the sole mechanics of R&D. This suggests that a new rationale for intervention should be considered, with new tools and new instruments supporting these interventions. In this latter approach, what matters is not to fix the problems that make the industry deviate from an optimal path by funding an optimal mix of actors and the optimal linkages between them, but rather to provide a platform and the means for actors and entities of an ecosystem to be able to collectively build a growing network of collaborations and partnerships out of which new opportunities (or paths) – entrepreneurial, technological, commercial, organizational – will be expected to emerge for the ecosystem as a whole.

This major paradigm shift naturally offers new possibilities for both new actors and new types of actors to venture within the ecosystem. It also offers new possibilities for (re)new(ed) partnerships between these actors, whether from the public, private and/or plural sector. It finally offers new possibilities for growth and development through the recombination and diversification of both input and output. Of course, for such positive outcomes to emerge, an efficient strategy should be designed and implemented (in terms of people management, capital management as well as in terms of knowledge management), in order to ease coordination and interaction between the actors and entities of an ecosystem, and in order to reinforce the commons as a result. This is precisely where public authorities may play a crucial role by acting as orchestrators of the ecosystem, as opposed to mere spenders.