

Open Innovation in the Public Sector

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” (1).

This strategy has been proposed as a way to develop innovative products beyond the internal capacity of the company as firms recognize that great talent often resides outside of their employ. A critical capability for open innovation that has been identified in the literature is the way that external providers of innovation are organized.

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.

One sector that has embraced open innovation is the public sector, in which many cities have undertaken transformations involving externalizing their innovation processes. These cities provide a wealth of experience in how to organize external sources of innovation. However, cities have not settled on a given business model for civic open innovation and the commons.

Instead, they rely on a diversity of actors and range of strategies to tackle innovation on multiple fronts.

Open innovation is most likely to succeed only when the needs of the entire ecosystem of sources and supporters of innovation are organized in ways that foster both competition and collaboration.

Multiple approaches for civic open innovation

Some of the approaches fostered collaborative communities, with informal relationships, technology sharing, and a range of intrinsic and extrinsic motivations. Other approaches saw competitive markets develop, with more contractual relationships, stronger profit motives, and less sharing among collaborators in the innovation community.

Open Data.

Many cities open some of their city datasets for public use in developing civic software applications. However, there was substantial diversity in the types of data opened. Some cities offer real-time crime feeds, school test scores, and demographic information by neighborhoods; other cities offered data on bicycle usage and placement of fire hydrants.

Hackathons and Application Development Contests.

A hackathon is typically a one to two-day event where computer programmers and others involved in software ●●

(1) source - *Open Cities - Open Innovation and Business Models in the Public Sector* - Melissa Lee (ESADE)

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development collaborate intensively to develop a new software application that meets the challenge posed by sponsors of the hackathon. Application development contests are similar except that the challenge is hosted online and typically runs a couple of months. Application development contests remove some of the difficulties of traditional hackathons such as hosting developers for a continuous 24 to 72 hours of intense software development. They often attract a wider range of participants than hackathons by allowing programmers in locations all over the world to collaborate. Many developers not willing to code for two days in a set location are more open to this method, which allows them to work little by little over a period of weeks or months.

Crowdsourcing.

Crowdsourcing is the use of the crowd to obtain ideas, services, or content from a large group of people, usually from an online community, rather than from traditional channels such as employees or suppliers (Wikipedia.com). Crowdsourcing is also used in cities as a tool built into innovation projects. In Helsinki, for example, Code for Europe fellows created an application to catalog art archived in a public museum. As the citizens view newly available but yet uncategorized images of art, they add descriptions to the images. The application works to aggregate this data, and after a number of descriptions match, the application creates a permanent tag, making previously unidentified works available for public enjoyment.



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Embedded Change Agents (Code for Europe Fellows).

As developed through this Commons for Europe project, Code for Europe, provides programmers, called “fellows”, to work with cities to develop applications for their Open Data initiatives. Code for Europe aims to inject the code developer culture into cities using application development, to close the gap between cities and citizens. The fellows work with an assigned city for a period of nine months to a year to develop applications, while also trying to break down bureaucratic processes and bring innovation to city government. The sharing of civic applications between cities is also a central component of these two organizations through the creation and development of the repository, Europe Civic Commons.

Civic Accelerators.

Civic Accelerators aim to translate the concept of a startup accelerator to the Public Sector. Traditional business accelerators offer advice and resources to fledgling firms to help them grow. In contrast, Civic Accelerators match cities with startups, private firms, and non-profit organizations interested in partnering with government to provide better services, bring modern technology to cities, or change the way citizens interact with city hall.

In summary, open innovation is not a single strategy or approach.

Actors involved in civic open innovation

A diversity of actors are involved in cities’ open innovation initiatives. At the core are:

- a) City managers and internal civic departments who are most familiar with the data and how the city operates.
- b) Citizens who choose to participate. For example, in Amsterdam, the term “civic innovator” has been coined to designate citizens that, without being developers, participate in hackathons and city innovation events.
- c) Developers who participate in creating applications. Developers participate in sponsored hackathons, application development contests and crowdsourcing exercises, usually numbering in the hundreds. In addition to the core participants of city departments, citizens, and developers, there are a number of additional actors that are included in the initiatives. These include:
 - d) Companies that use the open data in their existing applications (e.g., Google, Yelp). For example, Barcelona city managers put significant effort in collaborating with Google, Yahoo, and other companies involved with its transportation and tourist data efforts in order to leverage their existing platforms and large communities of users.
 - e) Consultants who help the city to open their data and helped companies to use the data.
 - f) Policy makers and city officials that establish the guidelines of how the data should be provided to developers and determine what data will be made available. Helsinki is a leader in Europe in establishing data standardization efforts, resulting in the European project CitySDK promoting standard formats and application program interfaces for Open Data in Europe.
 - g) Venture capitalists who judge, incentivize, and support

the city’s efforts at application development. Many hackathons and application development contest leverage venture capitalists to provide feedback on the viability and impact of applications developed in the contest. Additionally, the participation of potential investors incentivizes the participation of the developers interested in growing their applications into a sustainable business as many hoped to secure funding post contest. Venture capitalists are also an integral component of the Civic Accelerators, providing feedback and potential funding to those startups as well.

- h) Intermediaries. These organizations provide the ability to connect to collaborators and work between the city and those external agents. As cities have long operated with hierarchical governance, long-range goals, and traditional external contractors, they often struggle to adapt to the pace of innovation and related risk. Intermediaries are companies that substitute for this lack of ability. Some operate in almost lock-step with city hall, are funded by them, or serve in defacto roles as the civic department for open data, as in the case of Forum Virium in Helsinki. Others, such as Code for Europe, function in parallel with cities, with their own motivations and goals.

In sum, in contrast with the more common strategies in Open Innovation in the private sector that are characterized by dyadic relationships between a seeker and a solver (and sometimes an intermediary) cities host many different categories of actors, five of which were neither seeker or solver, but were actors supporting the effort. Also in contrast to the bilateral focus of Open Innovation in the private sector, cities appear to deliberately encourage cross-fertilization across all the actors – be they citizens, developers, venture capitalists or intermediaries

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Challenges in managing actors in civic open innovation

Managing such a mix of players in civic open innovation initiatives is difficult. The different needs, motivations, and priorities create competition for the scarce resources within the city – money and time – and the attention of the developer and citizen communities. In cases where too much conflict exists, collaboration stalls. One challenge experienced by the internal civic departments responsible for open innovation is that other departments within the city who needed to provide the data often had other higher priorities.

Also, while some cities enthusiastically pursue open innovation and are finding encouraging results, open innovation is still commonly viewed as peripheral to the more central projects of civic departments. Innovation projects are often viewed as high risk and value-added, but not mission critical. Strapped with limited time and fiscal resources, these open innovation initiatives have to compete with the mainstay projects that these departments had been committed to for decades with guaranteed results. It creates a case of competing interests between civic employees who are rewarded for results and severely punished for failure, and the civic innovation champions who were willing to take a gamble.

A second challenge is that, while the developer community is relatively homogenous - relatively young and mostly male - motivation to participate in the development of civic applications varies substantially among the developers. Code for Europe, for example, fosters a community of civically motivated developers, as its

strategy works to align developers with civic leaders but is focused less on financial rewards and business development. In contrast, in hackathons and application development contests, some developers are motivated by civic-mindedness and others by the profits and rewards of winning the contest. The hackathon and application development contests tend to attract developers with more diverse motivations, especially those more interested in entrepreneurship in application development rather than pure civic engagement. Similarly, private companies varied in their alignment with civic duty. Some businesses have a mission devoted to civic improvement, while others collaborate with the city as they would any other enterprise, focusing on the bottom line. Thus, even within seemingly homogeneous actor categories, such as developers, there was a diversity of motivation that need to be managed.

A third challenge is how to integrate intermediaries with the other actors. Intermediaries are often the most closely aligned external party to internal civic departments in the civic open innovation community. They are often non-profit and therefore less financially motivated, as in the case of Code for Europe, and have agendas to foster innovation (e.g., Waag Society). However, intermediaries experience the same misalignment of priorities that varying divisions within the city experience. Few civic departments within a city place as high of a priority on innovation as did the intermediaries, creating conflict when asking civil servants to prioritize those tasks over mainstay projects. ●●

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Civic application business models

Continuing on this line of research, we sought to explore the business models of applications using open data, used by citizens or city officials to interact with the city, and/or sponsored by the city through contests, hackathons, developer groups, or direct engagement. We explored community of developers in European cities involved in the Open Cities project (Barcelona, Rome, Helsinki, Berlin, and Amsterdam) through interviewing. Drawing on collected data, we constructed diverse types of business model from the perspective of capturing value. Based on monetary motives, we classified application business models into two broad constituencies: for-profit and Non- for profit, each constituency has been subdivided into different taxonomies.

The objective of this research is to understand how applications ideas are generated, and how cities or organizations can provide better service to developers looking to use open data. For this purpose I was interested to grasp developers' motivations for creating applications, especially how the developers have already created them, the problems they faced through the development and how they will make them sustainable. How are the applications creating value and how this value creation can continue to grow?

Furthermore, in almost all the application competitions, mostly innovative applications are rewarded. But on the other hand, the result shows that the most innovative applications won't necessarily be the successful one in future business practice. This research is seeking to address this phenomenon by analyzing underlying business mo-

dels of applications through interviewing community of developers in five European cities (Barcelona, Rome, Helsinki, Berlin, Amsterdam). As a key reference to determine how these applications do business in order to understand everything about applications ideas and how cities or organizations can add value to developers looking to use their open data.

Most broadly, civic applications developed on the backbone of open data can be classified into two categories: for-profit and not-for-profit. Each classification is then further divided into more narrow divisions to better understand the nature of the business models. For-profit models are categorized as making money, capturing reputation, creating awareness, testing idea, and personal reputation. Not-for-profit models are classified as gaining reputation, providing service, and creating awareness.

Conclusion

Despite all effort and support from the governments, the overall success of civic applications, and the value created for citizens is lacking. This failure is generally not because of the lack of innovation or creativity. Some underlying explanations for this failure are: first, that market of applications using open data is small and fragmented. There are not so many contests both national and international for these applications. Furthermore, from contest to contest and from country to country there are a lot of difference in standards, which the developers need to understand and adapt the application to each of these standards. Second, there is a lack of knowledge of the application developers towards the possible business models behind their application (and business as a whole).



Most developers are only focusing on the freshness and innovativeness of their ideas. Value capture is something that unfortunately, they neglect generally. This is a clear message for city officials. It is not enough to provide open data for free to encourage innovation and enhance transparency; they also need to invest in overall ecosystem management.

Center for Innovation in Cities

Cities have been, since their birth, deeply bound to civilization. Population, resources and knowledge have been increasingly accumulated in their streets and buildings for millennia.

These characteristics have placed cities at the vanguard of the great changes in history. Imperial China's cities permitted the invention of paper, Gutenberg designed its printing press in the German city of Mainz and the incandescent light bulbs were invented by Edison in a suburb of New York, to give just a few examples.

This transformative role is very much alive today in our cities where they are, more than ever, the meeting places of ideas, the perfect ecosystem for innovation. In more recent years, cities have also become themselves the object of the transforming activity they generate, aiming to improve sustainability, mobility and the quality of life of their inhabitants generally.

Open innovation is one of the tools to best funnel this innovation in order to transform cities in a participative and sustainable way. Emergence and success of initiatives like crowdfunding platforms, smartphone applications thought to ease citizens' lives and the first steps from administrations towards more Open Government are examples of the interest and need of advancing in that way.

The Center for Innovation in Cities puts together a group of academics with experience in open innovation, new technologies and public administration that, under the Institute for Innovation and Knowledge Management at ESADE, will focus its research on analyzing, proposing or inspiring solutions to improve the management of cities.

