OPEN CITIES

D1.1.52 Open Innovation and Business Models in the Public Sector

Project Acronym	**Open Cities**
Grant Agreement number:	**270896**
Project Title:	**OPEN INNOVATION Mechanisms in Smart Cities**

D1.1.52 Open Innovation and Business Models in the Public Sector

Revision:

Authors:

Melissa Lee (ESADE)

Project co-funded by the European Commission within the ICT Policy Support Programme		
Dissemination Level		
P	Public	
C	Confidential, only for members of the consortium and the Commission Services	X

Revision History

Revision	Date	Author	Organisation	Description
v.1	27/11/2013	Melissa Lee	ESADE	First draft
v.2	06/01/2014	Melissa Lee	ESADE	Final draft

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

TABLE OF CONTENTS

1. INTRODUCTION

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, p1). 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. We found, however, that 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. We find that 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.

2. METHODOLOGY

We examine the business models used in the public sector for innovation projects. Through the course of interviews, city visits, and conference attendance we previously identified Apps Contests, Embedded Agents of Change, and the Incubator models as ways of governing and making sustainable these collaborative efforts in government. This document extends that research to further examine the methods and types of communities that are fostered within these strategies.

3. MULTIPLE APPROACHES FOR CIVIC OPEN INNOVATION

Several approaches were identified that cities used for 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.

The following is a list of specific approaches used:

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 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.

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. No single method or set of methods for organizing external actors were found as a variety of approaches provides results.

4. DIVERSITY OF ACTORS INVOVLED 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.

5. 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 civic-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.

6. 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 models 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.

7. BUSINESS MODELS: A SHORT REVIEW

There is wide range of research in the field of Business Model (BM). BM underlines a system-level approach of explaining how firms "do business" and seeks to explain both value creation and value capture. It is centered on a firm, but its boundaries are wider than the firm. There is variety of motives for doing research on business models. Some scholars attempt to define new forms of business models; some others introduce methodologies for evolving business models, while others challenge to alter the primary elements of BM.

Some researchers believe that the development of the business model concept, and the extensive use of the notion since the mid-1990s, may have been rooted in the advent of the Internet (e.g., Amit & Zott, 2001), change in the traditional way of doing business, rapid growth in emerging markets and interest in "bottom of-the-pyramid" issues (Prahalad & Hart, 2002; Seelos & Mair, 2007; Thompson & MacMillan, 2010), and the expanding industries and organizations dependent on postindustrial technologies (Perkmann & Spicer, 2010). In other words, as Magretta (2002) put it "before the personal computer changed the nature of business planning, most successful business models [...] were created more by accident than by design and forethought."

Scholars have addressed the notion of business model in different contexts such as strategy, management, entrepreneurship, innovation, e-business, information systems, and economics. As a result, a wide range of conceptualizations of business models has been developed within each context. According to Zott et al (2011), researches in business model subject can be discussed in three fields: "(1) e-business types; (2) strategic issues, such as value creation, competitive advantage, and firm performance; and (3) innovation and technology management."

Identification of the types of business models being developed through collaborations with the private and public will help civil servants, civic leaders, citizens, entrepreneurs, and developers enhance innovation based on successful examples. Afuah and Tucci (2002) offer a nice attempt to classify (Internet) business models based on their source of value creation, a significant influence on the taxonomies we developed:

- *Advertising-based:* In this model the owner of the website provides the end users subsidized or free content, services, or even products that attract end-user visitors. In this model revenue comes from charging advertisers fees.

- *Subscription-based:* In this model the fees are charged based on unlimited use. Company charges a flat rate on a periodic basis that qualifies the user for a certain amount of service.

- *Fee-for-service-based:* In this model the fees are charged based on metered service. For this model to be sustainable, the businesses have to convince customers to intensively use service or to have a large volume of customers.

8. RESEARCH ON CIVIC APPLICATION BUSINESS MODELS

We developed a semi-structured questionnaire to elicit data on the four key themes: ideas behind the application, application availability and adaptability, collaboration with city officials and developers' community, and motivation and investment (outlined in Table 1: Questionnaire structure).

About the Application	
	What is the idea behind your application?
	How did you come up with the idea for the application?
	What is the backbone of your application? What kind of data? Government open data? Or other type of open data?
	Why did you decide to make an application?
	Is the application a central or complimentary part of your business?
	Are you the central creator? Did you work with a team?
Application Availability and adaptability	
	Did you publish in the Apple/Android store?
	What is download rates of your application?
	How long has the application been available to the public?
	Is your application for free or paid?
	Is the application mainly developed for use in one particular city? How many? How is it adapted?
	Is your application open source? If it is not already adapted for other contexts, could other developers adapt it?
Collaboration with city and developer' community	
	Have you participated in any applications contests or hackathons as part of the applications creation or development?
	Did you have any contact with other developers? Does feedback or other forms of community make an impact or motivate you?
	What is your relationship with the city officials? Did you meet with anyone to get data? Have you conducted any interviews with city officials, have you attended any city-sponsored open data or hacking events, talks?
Motivation and Investment	
	How much money did you invest to create the application?
	How long did development of the application take?
	How much ongoing maintenance does the application need? Does the application need constant upgrades/ data refreshing?
	What did you anticipate the returns would be for your effort?
	How much are you currently making from your application?
	Would you like this to become your primary business?
	Can you imagine that this could generate enough returns to make substantial amount of money?

	Are there other opportunities that the application has brought to you? Like reputation, or a contract from the government, or a job from the city?

Table 1: Questionnaire structure

	Item	Statistics
About Application	How do they come up with the idea of the application	62% data availability & contest, 24% personal challenge
	Did you use open data	90% open data, 10% collected data or generated by user
	central/complimentary part of business	52% central business, 48% complimentary or not a real business
	Role of interviewer	62% developer, 20% project manager, (18%) designer or marketer
	Do they work in a team	81% team, (19%) just developer
	Idea novelty of the application	33% novel idea, 20% novel in local
Collaboration with ecosystem	Participating in any contests or hackathons	86% participated, (14%) not interested
	Interacting with developers community	62% community of developers,10% utilizing user feedback
	Relationship with city official	48% yes, 24% tried but failed
App. Availability	Store availability	29% both, 24% only android, 24% web app
	Duration of the app availability to the public	From 6 month to 2 years, 1 not published
	Free/paid	81% Free, (14%) both (5%) paid
	Apps adaptability to other cities	90% same version just matter of data adaptability, 10% developing adaptable version
	Open source	38% providing platform to other developers, 62% not open source
Motivation and Investment	Amount of investment	62% spare time+ license fee, 38% outsourcing the programing
	Duration of the app development	From 30 hours to 2 years (with R&D)
	Existence of monetary outcome	62% zero money, 20% considerable money, 18% contest prizes
	Having potential of becoming primary business	38% optimistic, 20% real business, 42% lack of city support, no user interest

	Other opportunities app has brought	90% good reputation, expanding network, 10% nothing special

9. CIVIC APPLICATION TAXONOMIES

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 crating awareness (Table 2).

For-profit business taxonomies

For-profit taxonomies are companies that seek revenue. Among these businesses, there are three different way of capturing value: the ones who manage to make money, the ones who manage to create awareness and the ones who manage to build reputation (Figure 3).

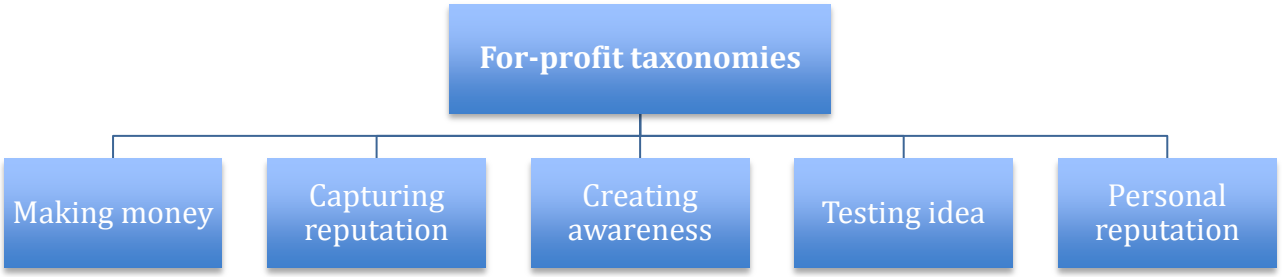

Figure 3: For-profit taxonomies

A. ***Making Money:*** The main objective of these businesses is to make money through satisfying citizen needs. Hence, R&D has significant share in application development cycle.

   Kindergarten-Suche is a decent successful example of this business model as it was aiming to satisfy citizens' needs using open data. They knew about the difficulties and importance of finding a kindergartener in Germany, specifically in Berlin. Because there is large number of kindergarteners in Germany and finding the suitable one in terms of different factors such as location, facilities, opening hours and etc. was not easy for parents. They developed the application first for Berlin and afterwards they expand the market and publish it all around Germany.

B. ***Capturing reputation:*** Applications that are classified in this taxonomy are redefining traditional value capture. They often realize that their application market is too small with an insufficient customer base to make money through advertising or the small fee coming from mobile apps. As a result, these types of applications often evolve to advertise a similar solution that provides for better value capture – specifically financial. For example, a mobile app might be developed to showcase a larger desktop application.

C. ***Creating awareness:*** This taxonomy consists of small companies that want to test whether the idea of their application is viable or not. Some are developing applications in initial

stages of their business to create awareness through mentions in press, participating in various contests, and application availability. If they are successful in creating enough awareness, in subsequent stages they try to make money.

D. ***Testing idea:*** Most in this classification are single developers that have an idea and want to know if it's good enough or they need to invest more. These developers are at a first level of establishing a start-up business and they test the business case to see if it's viable or not.

E. ***Personal reputation:*** This classification is mostly represented by single developers who are working in highly visible open source projects. Essentially, they want to improve their skills in order to gain reputation in the community.

App Taxonomy	App Name	Category	City	Relation with city official	App availability	Open Source	Download No.
For-profit making money	uClinics	Healthcare	Barcelona	Nothing special	Apple/Android	No	9000
	FGC	Transportation	Barcelona	Limited relation to get data	Apple/Android	No	10000
	Kindergarten-Suche	Education	Berlin	Organizing some events	Apple/Android	Yes	11000
	AmsterdamApp	Geographical	Amsterdam	Relation with national org.	Web-App	Yes	6000
	OpenbaarVervoer	Transportation	Amsterdam	Limited relation to get data	Apple	No	2000
For-profit capturing reputation	Blind Square	Navigation	Helsinki	Collaboration to access data	Apple	No	6000
	BikeDistrict	Transportation	Rome	Unsuccessful effort	Web-App	No	3000
For-profit creating awareness	Huellasolar	Weather Forecast	Barcelona	Tried a lot, no result	Web-App	Yes	6000
	ComunicaPA	Transportation	Roma	Limited collaboration	Android	Yes	5000
For-profit testing idea	OperadorApp	Communication	Barcelona	No need/using CMT	Apple/Android	Yes	4000
	iKringloop	Recycling	Amsterdam	With open data department	Apple/Android	No	5000
For-profit personal reputation	PixHunting	Tourism	Barcelona	No relation	Android	No	2000
	Smart Recycling	Recycling	Barcelona	Tried a lot/But no budget	iTunes	Yes	1000
	Trova Farmacie	Healthcare	Rome	No	Not Published	No	1000
	Mapnificent Berlin	Transportation	Berlin	Tried a lot, no result	Web App	No	5300
No-for-profit gaining reputation	DoveSiButta	Recycling	Rome	Limited collaboration	Android/Apple	Yes	894
	Commutio	Communication	Barcelona	Tried a lot, no result	Android/Apple	Yes	5000
	Eureka!	Social	Rome	Tried a lot, no result	Android	No	5000
No-for-profit providing service	Navigatore Museo	Tourism	Rome	Yes, to improve data quality	Web App	No	4000
No-for-profit creating awareness	Istituto Europeo	Tourism	Barcelona	No	Not published	No	-
	Spot in Helsinki	Entertainment	Helsinki	Limited collaboration	Android	No	4000

Table 2: Taxonomies representative of all Apps

Not-for-profit taxonomies

The not-for-profit business model typically includes public and private organizations that finance application development for their communities and seek to effectuate positive changes in society (Figure 4).

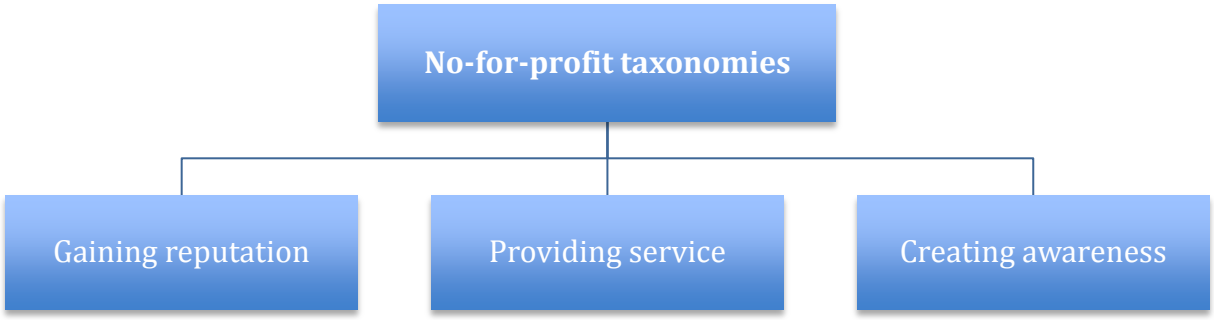

Figure 4: No-for-profit taxonomies

A. Gaining reputation: Applications in this classification are developed to support the offline efforts of many organizations. The popularity of mobile apps and involvement in civic apps contests lends legitimacy to many grassroots initiatives.
B. Providing a service: Applications that are classified in this category are developed to provide a service to citizens or to make a change in society. Applications for museums to provide a better experience to visitors is a well-known example of this taxonomy.
C. Creating awareness: Most non-profit and public organizations can be included in this classification. One of the biggest challenges of these organizations is building awareness. The popularity of mobile apps and involvement in civic apps contests facilitates this.

10. DISCUSSION

Based on the taxonomies presented in the previous section, there are various motivations and incentives for developing civic open data applications. As some are more popular than others, it is worth focusing on these taxonomies to find some tailored solutions to help civic developers toward success.

The largest taxonomy contains the for-profit companies that have managed to make money. These businesses have to invest a great amount of time and energy on market research to derive real and existing needs of citizens; in some cases the time spent on obtaining market data is twice or three times the development time for application. A possible solution to help developers shorten this research period is through collaboration with others and through data standardization across sectors and locales.

The second largest taxonomy is companies with the goal of capturing reputation (for profit or not-for-profit). These businesses are mainly focused on winning the contests. A possible solution for for-profit businesses is through settings to facilitate the collaboration and networking with high-level firms in the same sector. Moreover, inviting some high level firms in related sectors to get involved in contests will help both for-profit and not-for-profit business to thrive. Here is a quote from project manager of one the companies:

> *"We spoke with city officials. They were happy with the* application*, but they explicitly said that they are not going to invest on the* application*. But now, we are doing some studies to find out user behavioral patterns and trying to build a partnership with city halls via this channel."*

The third taxonomy most populous is companies with the goal of creating awareness. These companies are mainly focused on participating in different contests or being part of related communities. A possible way to foster these business models lies in stimulating communities through funding or better advertisement of newly opened data. Here is a quote from one of the developers:

> "*It is not easy to get in to* applications *contests or developers' ecosystem. First we need to have at least one successful* application *and then it would be possible to enter into this world. I believe that the main factor of my failure is lack of sponsor and support from contests*."

11. 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.

12. REFERENCES

Amit R. & Zott, C. (2001), "Value creation in e-business", Strategic Management Journal, 22: 493-520.

Amit, R., & Zott, C. (2012). "Creating Value Through Business Model Innovation".

Alt, R., & Zimmermann, H.D. (2001) Preface: Introduction to Special Section–Business Models. Electronic Markets 11(1):3-9.

Birkinshaw, J., & Hamel, G., & Mol, M. J. (2008). "Management innovation". Academy of Management Review, 33: 825-845.

Bouwman, H., & De Vos, H., & Haaker, T. (Eds.). (2008). Mobile service innovation and business models. Heidelberg, Germany: Springer.

Casadesus-Masanell, R., & Ricart, J. E. (2007), "Competing Through Business Model". IESE Business School.

Chesbrough, H. W., & Rosenbloom, R. S. (2002). "The role of the business model in capturing value from innovation: Evidence from Xerox Corporation‟s technology spinoff companies". Industrial and Corporate Change. 11: 529-555.

Chesbrough, H. (2006). Open business models: How to thrive in the new innovation landscape. Boston, MA: Harvard Business School Press.

Chesbrough, H. (2007). "Business model innovation: it's not just about technology anymore". Strategy & Leadership, Vol. 35, Iss: 6 pp. 12 – 17.

Chesbrough, H. & Schwartz, K. (2007). “Innovating Business Models With Co-development Partnerships”. Research Technology Management.50: 55.

Chesbrough, H. (2010). “Business Model Innovation: Opportunities and Barriers”. Long Range Planning 43, pp. 354-363.

Elliot, S. (Ed.) (2002). Electronic Commerce: B2C strategies and models. Chichester, UK: John Wiley.

Fielt, E. (2011). “Understanding Business Models”. Business Service Management Whitepaper. Volume 3.

Hawkins, R. (2001). The “Business Model” as a Research Problem in Electronic Commerce. SPRU – Science and Technology Policy Research.

Johnson, M. W., & Christensen, C. M., & Kagermann, H. (2008). Reinventing your business model. Harvard Business Review, 86(12), 50-59.

Johnson, M. W. (2010). Seizing the white space: Business model innovation for growth and renewal. Boston, MA: Harvard Business Press.

Krcmar, H. (2011). “Business Model Research”. Mische Universitat Munchen.

Magretta, J. (2002). Why Business Models Matter. Harvard Business Review, May, pp. 84-92.

Morris, M., & Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: Toward a unified perspective. Journal of Business Research, 58(6), 726-735.

Mullins, J., & Komisar, R. (2009). Getting to plan B: Breaking through to a better business model. Boston, MA: Harvard Business Press.

Osterwalder, A. & Pigneur, Y. (2002). An eBusiness Model Ontology for Modeling eBusiness. In the Proceedings of the 15th Bled Electronic Commerce Conference – eReality: Constructing the eEconomy. Bled, Slovenia, June 17 – 19, 2002, pp. 70-90.

Ostenwalder, A., & Yves, P., & Tucci C.L. (2005). “Clarifying Business Models: Origins, Present, and Future of the Concept”. Communications of AIS, Volume 15, Article 1.

O‟Mahoney, S., & Ferraro, F. (2007). “The emergence of governance in an open source community”. Academy of Management Journal, 50: 1079-1106.

Pateli, A., & Giaglis, G. (2003). „A Framework for Understanding and Analysing e-Business Models‟. In Proceedings of the 16th Bled Electronic Commerce Conference – eTransformation, Bled, Slovenia, June 9–11.

Petrovic, O., & Kittl, C., & Teksten, R.D. (2001). Developing Business Models for e-Business. In the Proceedings of the International Conference on Electronic Commerce 2001, Vienna, Austria, October 31 – November 4.

Sääksjärvi, M., & Lassila, A., & Nordström, H. (2005). Evaluating The Software As A Service Business Model: From CPU Time-sharing To Online Innovation Sharing. IADIS International Conference e-Society.

Schaltegger, S., & Lüdeke-Freund, F., & Hansen, E. G. (2012). “Business cases for sustainability: the role of business model innovation for corporate sustainability”. International Journal of Innovation and Sustainable Development, 6(2).

Tapscott, D., & Lowi, A., & Ticoll, D. (1998). Blueprint to the Digital Economy: Creating Wealth in the era of e-Business. McGraw-Hill, New York.

Teece, D. J. (2010). Business Models, Business Strategy and Innovation. Long Range Planning, 43(2-3), 172-194.

Timmers, P. (1998). Business Models for Electronic Markets. Journal on Electronic Markets, 8(2), p. 3-8.

Zott, C., & Amit R., & Massa, L. (2011). “The Business Model: Recent Developments and Future Research”. Journal of Management.