



Business models adopted by intermediaries in the use of open government data

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Abstract

After the adoption of open data policies by governments around the world, new business models began to explore the databases opened and create new products and services that may or not generate revenue for its providers. From this scenario, this study aimed to understand the business models adopted by service providers that use open government databases or databases built from public data and data captured by tools resulting from these new products and services. Therefore, we analyzed seven cases of businesses awarded in prizes that had evaluation criteria such as innovation, technology and services to the population. This qualitative study aimed to identify evidences of phenomena relating to the use of open government databases, the participation of these service providers in the open government data value chain and features present in their business models that could be replicated in new cases. The main findings revealed that business models need to create databases that standardize and integrate the various data sources applied before using this data into their tools offered to users. Products and services were designed to assess the monitoring and supervision of public administration and contribute to an improvement in the use of public utility by the tool users. We also identified that business models linked to activities such as provision of utilities, building of groups around a common theme, socio economic development and social participation in public management.

Keywords: Open Government Data, Open Data Value Chain, Business Model, Intermediaries.

Introduction

In 2009, the newly elected US President, Barack Obama, on his first day in office, surprised millions of people with the announcement of the Open Government Data (OGD) policy (USA, 2009). The concept of OGD consists of practices of releasing government data in the public domain (i.e. non-confidential data and data that are not protected by any confidentiality legislation) for free use by society (AGUNE et al, 2010; RODRIGUES, 2011). The initiative itself was seen as a new phenomenon and the promise of disclosure of non-personal government data in order to enhance transparency, participation and collaboration in government.

Companies, communities, entrepreneurs and civic hackers have been devoted to finding and using OGD in the development of new tools for control and monitoring of the services provided by governments, for data, budget figures, public spending, investment, services rendered to the population or data of inspections resulting from the control of the government on the economic activity of the population, or even the creation of services or tools that generate some kind of financial return for its creators.

The possibility of governments to open their databases for the general population goes far beyond the initial goal of transparency and fight against corruption. Transparency, however necessary, in this case would be just one of the elements within the various benefits that citizens can count on in the medium and long term, while new companies and existing ones can use these databases in their services and products creating new business models.

This research focused on the operation of such business models using OGD bases, which must be organized and made available in sites in order to give transparency to government activities. We have conducted an exploratory qualitative study with seven cases of application of use of OGD, seeking to explore the issue, generate an interpretation of OGD value chain and propose a categorization of types of use.

The survey was conducted through an exploratory study of business models using OGD bases together with proprietary basis or bases built from the collection of public data by the business model. These databases are organized, and the adopted business model can offer to users products and services through mobile applications or websites. The aim of the study was to identify formats, business processes and procedures that can be replicated and that may enable the business model to be sustainable and profitable.

This article presents the theoretical framework related to e-government and OGD and to the Open Data Value Chain. The following describes the methodological procedures adopted for the research and selection of cases; study results are discussed, and then, the conclusion with some final remarks.

Theoretical background

E-Government and the OGD initiative

The government is one of the sectors that uses the potential of ICT (especially the Internet and Web) to innovate and expand its operations the most. At all levels, local, state and federal, the use of ICT by the government is known as e-gov, Electronic Government or e-government. Although there is no single definition for this word, Criado and Ramilo (2001) define e-government as the adoption of ICT by the public administration, with different routes by which they connect and interact with other organizations and individuals (citizens). How-

ever, Diniz *et al.* (2009) point out that the e-government approach goes beyond (without excluding) the size of the intensive use of technological resources in the public sector.

Given the complexity of initiatives that fall under e-government, several authors (CUNHA and MIRANDA, 2008; DINIZ *et al.*, 2009; HALDENWANG, 2007) propose that e-government initiatives be classified into three general categories: e-Public Administration, e-Public Services and e-Democracy. The third one refers to the increased and more active participation of citizens, made possible by the use of ICT in the processes of information, participation and decision-making (CUNHA *et al.*, 2007).

Thus, the initiatives of opening data and transparency of the activities undertaken by the State may fall within the category of e-democracy because they allow data to be analyzed and crossed according to the interest of users, thus allowing the identification and clarification of information according to the point of view analyzed by the user. This analysis, from the user's point of view, contributes with new ideas and arguments that may influence state decision-making.

To grow into a more mature and consolidated entity that is fully functional, e-government programs go through implementation stages. According to Koch *et al.* (2005), the e-government development stages go through five different levels: Informational, Interactional, Transactional, Integrated and Collaborative. In the *collaborative* stage, knowledge is highly integrated, requiring refined encoding methods. The capture of knowledge occurs both from internal and external sources and its dissemination occurs through collaboration tools. This stage provides mechanisms that promote high levels of citizen participation. At this stage the data opening initiatives and transparency of state activities are classified. They allow a larger and more active citizen participation, driven by the use of such data in collaboration tools that have the potential of generating information with high benefit to its target audience.

According to Van Den Broek *et al.* (2012), the openness movement foresees that, to the extent that it allows free access to data and these be reusable, it generates a greater impact on citizens ability to monitor the governments and demand its efficiency and effectiveness and also allow private companies to use open data, developing new services and products that can be more effective and efficient, stimulating innovation in public services.

Currently there is a growing movement among government institutions around the world to provide their public (and primary) databases to the population, allowing relevant groups of civil society to use these resources (data) in order to meet the citizens' demands. This open governance movement happens in many countries such as USA, UK and Australia (PELED, 2011; RODRIGUES, 2011). In Brazil, the São Paulo State Government, by the SP Open Government program, was the first initiative in this direction, according to Agune *et al.* (2010). Currently, other initiatives such as the one from the Pernambuco State Government, the Federal Government, the Lower House and City of São Paulo, are also being held in this direction.

The open data term is defined by the Open Knowledge Foundation as "*data that can be freely used, reused and redistributed by anyone*" (OPEN KNOWLEDGE FOUNDATION, 2012). The concept of OGD consists of practices of releasing government data in the public domain (i.e. non-confidential data and data that are not protected by any confidentiality legislation) to free use by society (AGUNE *et al.*, 2010; RODRIGUES, 2011). The definition of OGD considers guarantee access to primary data to society, allowing the interested party to manipulate the data in order to combine them, cross them and consequently generate new information and

applications, contributing to the creation of social knowledge from government databases (AGUNE et al, 2010).

According to Diniz (2010), government institutions generally have a large amount of information to use in their internal operations and facilities. However, often this information is published in proprietary formats or formats that prevent these to be accessible to all interested parties, for example, incompatibility of equipment for a person using a mobile device or a computer, requiring the use of proprietary software and the existence of accessibility barriers for people with disabilities (DINIZ, 2010). The objective of OGD is to overcome the limitations of access this information so that these published data can be easily found, accessed, understood and used according to the needs and interests of each individual who accesses them.

Open Data Value Chain

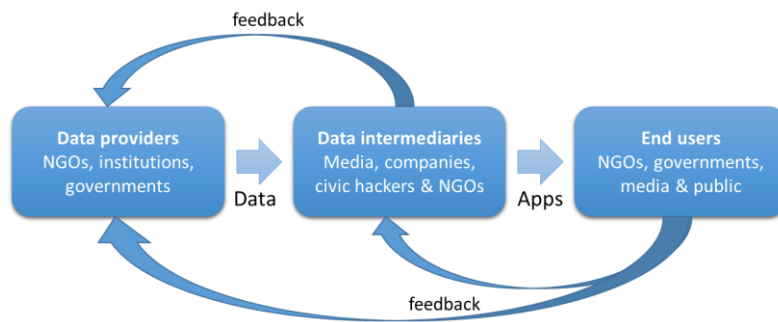
The literature addressing open data value chain and related concepts is recent and still limited. Due to the relative novelty in this theme, much of the literature used in this study consists of conference proceedings (LATIF et al, 2009; KUK and DAVIES, 2011; MAYER-SCHOENBERGER and ZAPPIA, 2011) and academic thesis (VAN GRIEKEN, 2011). In addition, descriptions of open data value chain were developed in presentations and posts by parties interested in the subject having its origin in the government itself (STOTT, 2012; HUGHES, 2011a; VAN DEN BROEK *et al*, 2012 MAKE A DIFFERENCE WITH DATA, 2013), in the academy (DAVIES, 2011), in organizations and groups involved in the theme (W3C-BRASIL, 2012; FERRAZ, 2013; OD4D, 2013) and in business (KALTENBOECK, 2012; GISLASON, 2012, MILLER, 2010). Such contributions are useful in filling the gaps in the literature of open data value chain.

The methodology commonly used in these studies is to import theoretical models developed in different contexts and test its fit in open data theme by qualitative researches, so that it be possible to propose the participation of a new element in the value chain identifying what would be necessary for the operation of the open data value chain. For Hughes (2011a), the purpose of these discussions and researches is to develop a framework for understanding and analyzing the transparency and the open data ecosystem, because we must consider not only the fact that the data should be published and its format, but also how people can be supported and empowered to make effective use of data.

There are three main components in any successful open data ecosystem: government, businesses and citizens. Each component provides data for itself and for the others. On the other hand, companies and government use data to deliver services required by all components of the ecosystem (DELOITTE LLP, 2012).

Van den Broek *et al* (2012) analyzed open data and transparency in non-governmental organizations linked to the United Nations and proposed an open data value chain outlined as follows in Illustration 1:

Illustration 1 Open Development Data Process.

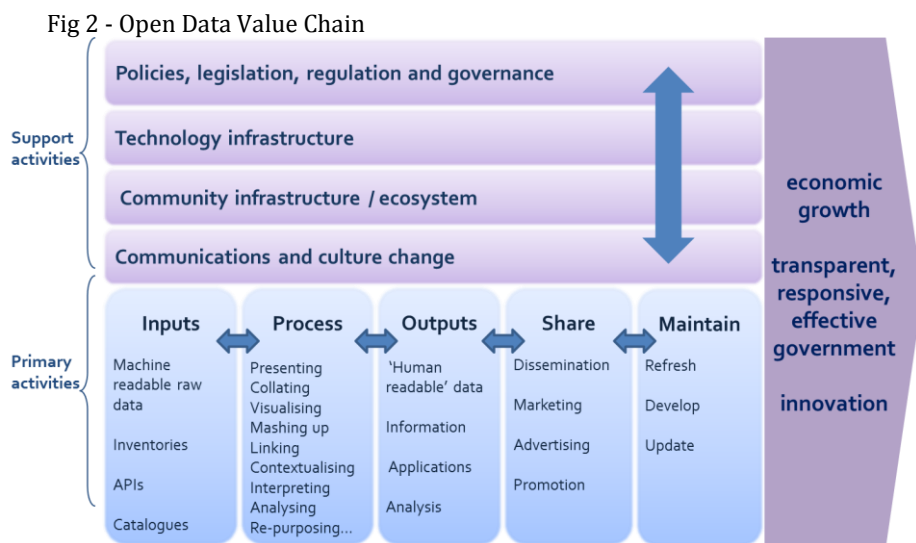


Source: Van den Broek *et al* (2012)

For authors, data is created and published by data providers, but is not informative in itself. Generally, the data represents columns and rows with quantitative data. Thus, data intermediaries are needed to analyze and reorganize the raw data for information purpose. They state that this upgrade from data to information is generally made by third parties, such as journalists, companies using this data to produce reports and analyses, NGOs, developers and civic hackers who find a special incentive to use, reorganize and generate information from these data.

In the open development data process schema proposed by Van den Broek *et al* (2012), these groups are called 'data intermediaries'. Normally, their work result in mobile applications, reports, mashups or other tools that help end-users to interpret, link with other data, view and even add data, information or knowledge to the original data source. The group of end users is represented in the third block in the scheme.

Hughes (2011b) proposed an initial framework for an open data value chain. According to the author, the value chain should show the activities that are necessary so that open data and transparency collaborate for a better government s, more responsive and transparent, thus providing economic and innovation benefits.



Source: Hughes (2011b)

For Hughes (2011b), the development of a framework for the open data value chain could help in the interpretation and visualization of the entire operation of the chain and thereby help to identify where the weak points are in the ecosystem, thus encouraging the development of new research in order to fill the gaps in the theory.

It is understood that a value chain of effective and sustainable value must have an understanding of the end use of data for building successive transformations, specifically in the creation of machine-readable data. The efficiency should be enhanced at every stage of the chain. It is also understood that the primary activities of *Collaboration* and *Maintenance* in the framework proposed by Hughes (2011b) are essential for the development of useful applications from open data because it is understood that the dissemination of the data makes more and more users to access them, and marketing, advertising and promotion can attract more users for these applications. In maintenance activity, it is essential that data is loaded into the application as soon as these are produced or made available, and also the constant update of data already loaded. However, none of these activities will be appropriate if the development of applications is not efficient.

Business Models

The term “business model” has become increasingly used in recent years particularly with the increase of online businesses. According to Osterwalder and Pigneur (2003a), the vast majority of studies and researches published about business models have focused on business conducted on the Internet. For these authors, the business models are a way to improve how to do business under conditions of uncertainty and may also be considered as the conceptual link between strategy, business processes and information systems, facilitating communication between them and allowing the sharing of knowledge.

This research used the definition that a business model is a representation of a conceptual abstract model that represents the business logic of a company in “making money”, and the relations between the elements that compose it. Business models help to capture, visualize, understand, communicate and share the business logic of an organization (OSTERWALDER, 2004). Therefore, we sought to identify how the service providers analyzed in the study generated revenue, what were their products, their customers relationship and distribution channels, what activities and partnerships support their structure and the costs involved.

Osterwalder and Pigneur (2003a, 2003b) and Osterwalder (2004) presented an ontology proposal for business models, structured in four large pillars, these works were influenced by the Balanced Scorecard approach of Kaplan and Norton, published in 1992 in the Harvard Business Review. The blocks are presented in table 01.

Table 01 - The four business model pillars

Pillar	Description
Product	It describes the value proposition of company and its products and services offered. An offer is characterized by: descriptive properties, life cycle, level of value and price level.
Customer interface	It describes how the company keeps in touch with its customers and what type of relationship it wants to establish with them. It also includes the customer segment, the channels to reach out to customers and the kind of relationship to be maintained. The relationship with the customer describes how and to whom the established value proposition will be delivered by the company as its competitive advantage.
Infrastructure management	It describes the activities, resources and partnerships needed to provide the product innovation and customer relationships in order to meet the value proposition. It specifies the capabilities and resources of the business model, its owners and suppliers, as well as who performs each activity and how they relate to each other.
Financial aspects	It describes the revenue flow, pricing mechanisms adopted by the company and shows how the company makes money with product innovation, related to the customer and the use of organizational infrastructure.

Source: Adapted from Osterwalder and Pigneur (2003a, 2003b) and Osterwalder (2004).

Osterwalder (2004) split these four pillars by expanding into nine elements, arranged in the four pillars, based on the literature analysis and the convergence found in authors studied, resulting in nine aspects as shown in Table 02.

Table 02 - The nine business model building blocks

Pillar	Building block of Business Model	Description
Product	Value proposition	A Value Proposition is an overall view of a company's bundle of products and services that are of value to the customer.
Customer interface	Target Customer	The Target Customer is a segment of customers a company wants to offer value to.
	Distribution Channel	A Distribution Channel is a means of getting in touch with the customer.
	Relationship	The Relationship describes the kind of link a company establishes between itself and the customer.
Infrastructure Management	Value Configuration	The Value Configuration describes the arrangement of activities and resources that are necessary to create value for the customer.
	Capability	A capability is the ability to execute a repeatable pattern of actions that is necessary in order to create value for the customer.
	Partnerships	A Partnership is a voluntarily initiated cooperative agreement between two or more companies in order to create value for the customer.
Financial aspects	Cost Structure	The Cost Structure is the representation in money of all the means employed in the business model.
	Revenue model	The Revenue Model describes the way a company makes money through a variety of revenue flows.

Source: Osterwalder (2004)

From the nine blocks shown in Table 02, Osterwalder and Pigneur (2010) proposed a graphical way of interpreting and representing business models. The nine groups now repre-

sent an interactive scenario and relationship explaining the exchanges between the different actors and environments. In a didactic way, the authors proposed the construction of a framework and created a tool to describe, analyze and design business models called "Business Model Canvas" or Canvas (OSTERWALDER and PIGNEUR, 2010).

Research methodology

This research is justified by recent feature of OGD and events related to the subject in the academic and professional approaches. In the academic focus, research sought to contribute to recent studies on OGD, from the perspective of business models adopted by companies using OGD bases in their services and products, and this perspective is present in similar studies, as seen by a bibliographical survey conducted in 2013 in the ISI Web of Science and SciVerse Scopus databases.

For this study, an exploratory qualitative approach was chosen, using multiple case studies. Data drawn from semi-structured interviews were analyzed with the goal to generate an interpretation of the OGD value chain and propose a categorization of types of uses found for the OGD in the several cases.

The technical procedures in the research were: interviews with experts in e-government in the state of São Paulo; bibliographical research on the subject and the problem to be studied; drawing up of a interview guide for conducting semi-structured interviews, case selection; information collection through semi-structured interviews and its transcription; and the application of an analysis plan for writing a report for each case study and a set of data used in the analysis and conclusions of the study.

The selection of respondents originated from the identification of projects submitted to national contests and prizes related to the theme, such as Rio Apps and the Mário Covas prizes, in 2012. Detailed business and initiatives highlighted in the interviews with respondents were also considered. From a total of 17 businesses, 13 responded to the contact and 7 agreed to participate.

After the interviews, a report for each case was prepared, describing the context that generated the application tool, details of the development of the tool, the business model adopted, the databases used, the economic environment of operation and images of the tool in operation. The reports were then subjected to qualitative analysis (FLICK, 2009, p. 277) in order to encode the material identifying categories or phenomena that could be detailed and investigated, looking for the development of concepts. For the qualitative analysis, we used the Coding Theory (STRAUSS and CORBIN, 1990), which enabled the encoding of content phenomena and categories with the help of basic questions applied to the text.

The phenomena and identified categories allowed the identification of common patterns and common characteristics to the businesses studied, making it possible to list activities that can be replicated in new businesses. To conclude the study, an analysis of businesses databases was performed and it was classified according to the concept of OGD and the problems faced.

From the content analysis of each case, phenomena and problems present in the studied business were identified and listed. In table 04 the seven cases are presented, including information on the data sources used, the target audience, the available technology, the governance model and the business model.

Table 04 - Common attributes identified in the cases.

	Sources	Target audience	Available technology	Governance	Business Model
Case 1 - Rain Alert	Gov. Bases	User (wide)	<i>Mobile</i>	Private	Donations
Case 2 - Bus track	Gov. Bases + Users	User (wide)	<i>Mobile</i>	Private	Advertising + Consulting
Case 3 - Unified Bicycle Map	Gov Bases + Users + Partners	Activists (limited)	<i>Mobile and Web</i>	Private (NGO)	Sponsorships
Case 4 - Pacified	Company + Private bases	Civil surveillance (limited)	<i>Mobile and Web</i>	NGO	Advertising
Case 5 - Where did my money go?	Gov. + Bases Comments	Civil surveillance (limited)	<i>Web</i>	NGO	NGO
Case 6 - Live Bus	Gov. + Bases Users	User (wide)	<i>Mobile</i>	Private	Advertisings + Subscriptions
Case 7 - Political Performance	Gov. + Bases Comments	Social Service (limited)	<i>Web</i>	Private	Consulting

Source: Elaborated by the authors.

In case 1, the goal of the tool was to change how the public service was delivered to the population. In this case, government data produced by a public facility were used in situations contextualized to the user. In cases 2 and 6, the tools intended to help the user in the use of public facility showing relevant information to the user's context and that could improve decision making related to the public service used by the user. In both cases, tools are related to the delivery of public utilities.

In cases 3 and 4 tools were meant to strengthen a community or group of people around a common theme. The tool played the role of providing community interest information and provide all users with functionalities to contribute to the maintenance and expansion of the database and thus enable the strengthening of the business related to community interests.

In case 5, the tool intended to facilitate the follow-up activity and supervision of public spending. It also aimed to provoke debate for opening government data so that new tools could be created and thereby increase the participation of the population in public management. In case 7, the tool intended to assist the participatory democracy process, creating communication channels between the political class and society and offering tools for the society to follow up and monitor the actions of executive authorities. In both cases, the tools related to civil society in public management.

Regarding the type of sources used, bases using open government data (Gov Bases), data from user interaction (Users), data extracted from user feedback (Comments), data generated by a business model (Private Bases) and also bases created with partners' data (Partners) were identified.

The target audience of these tools can be divided into two categories: **General**, where the possibility of finding people interested in using the source may occur in any segment or group of society, and **Limited**, where people interested in using the tool are specific groups. In the general category, the target audience is referred with the nomenclature User. In the Limited category, the target audience is referred with three different nomenclatures, Activists, Civil Surveillance and Social Services.

Regarding the technology available for access and use of the tools offered by the business model, only two categories were identified: **mobile**, represented by mobile applications running on smartphones; and **web**, represented by the tools that have a more complex interaction and require a web browser so that the user can effectively use all the tool's resources. Regarding governance, the business models were basically managed by private entities or non-governmental entities.

Six distinct ways to generate revenues in business models were identified: a) ads displayed to the tool user; b) consultancy services that could be offered using the knowledge generated by various data sources stored and integrated in the business model database; c) subscriptions offers providing extra features to the user; d) donations from people interested in the subject; e) partnerships with NGOs and also f) sponsorship of organizations interested in linking their brands with the purpose of the tool.

Results

The creation of databases from public data or from the use of the tool by the user, as an alternative to difficult access and use of government databases was identified as an important issue for the companies surveyed. It was also observed the existence of activities to integrate multiple data sources in a standardized source on a specific theme and with access available to those interested in the subject in order to strengthen the community linked to the theme.

It was also possible to identify in the cases, phenomena related to citizen participation in the monitoring and supervision of public management and phenomena related to improvement on the use of a service or public resource.

Thus, we may categorize the phenomena into 4 types: a) Database Creation using captured or produced data from tool; b) Database Creation to integrate and standardize multiple sources; c) Promote and engage civic monitoring and supervision of public administration; and d) Contribute to improve the use of a public facility.

During the cases analysis, we also sought to identify situations or problems that could negatively interfere in the business operation and that were related to the collection and use of open government data. The problems that repeatedly shown up in the cases were related to access to government databases and the data quality. It was also identified the difficulty in obtaining and using government databases because of the lack of policies and rules to guide the dissemination and access to these databases. Finally, problems with the structure of the databases and the lack of documentation or metadata were also identified.

From the content analysis results, it has been identified activities related to the business economic sustainability and that could be replicated in new businesses in order to provide economic sustainability.

It was observed that businesses use databases with relevant, reliable and up to date information. Mobile applications are used to assist the user in any location and any time, so it was essential that data be always up to date and correct so that information offered to the user, be useful. For this feature, key activities were needed, such as integration and importing of different data sources.

For the application to keep its users and also to broaden its set of users, activities such as development and evolution of tools and creation of new features and facilities to users must be present in the business.

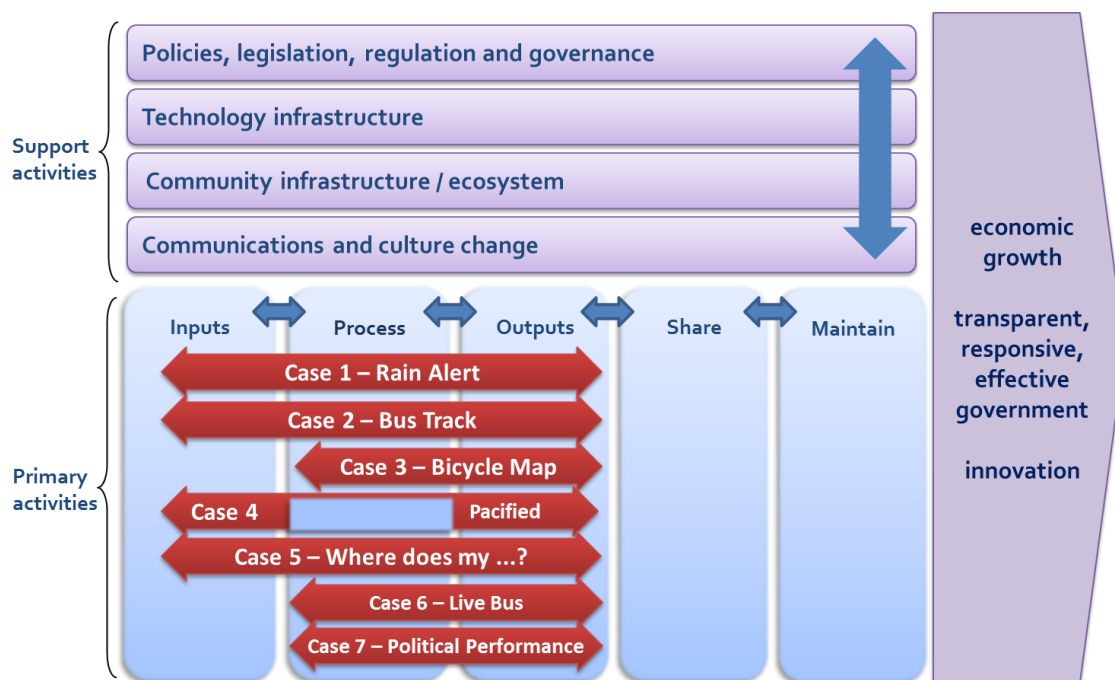
The product or service offered by the business should provide useful information according to the context and the user's needs. The product or service should perform the information monitoring and provide data related to the users interests and facilitate navigation through this information.

Finally, sources of income, fundamental to the sustainability of the business were built by: a) consultancy, that would be carried out using databases created from the tool usage monitoring; b) sponsors who wish to link their brand to the business theme; c) subscriptions or offer of complementary versions with extra features and functionality. And yet, for cases where the number of users was considered large and significant for business managers, media opportunities were explored through ads related to the user's interest.

Cases position in the open data value chain

A strong participation of the cases studied in the primary activities of processes and Outputs was identified. The strong participation in the Process activity may be justified by the recurrent need of treatment as well as loading different bases in order to produce a single integrated and parameterized base with criteria of interest to the subject. In the Output activity, the production of useful information to the customer in the business could be interpreted as the objective of the tool. Four cases still had participation in the Input activity, acting as data generators in their business models.

Illustration 3 - Positioning of the cases in the value chain of the OGD



Source: Elaborated by the authors.

Adequacy of databases to OGD concepts

Regarding to meeting the peculiar characteristics (W3C, 2011) for the provision of databases used by the business models studied, it was found that there were problems relating to availability and access to databases.

Illustration 4 - Adherence to the characteristics and principles of OGD

	1 – Rain Alert	2 – Bus Track	3 – Bicycle Map	4 - Pacified	5 – Where does my Money go?	6 – Live Bus	7 – Political Performance
Particular features (W3C, 2011)							
Availability and Access	●	●	●	●	●	●	●
Reuse and redistribution	●	●	●	●	●	●	●
Overall participation	●	●	●	●	●	●	●
Principles of the OGD initiatives (OPENGOVDATA, 2007; W3C, 2011, p.14)							
1. Complete	●	●	●	●	●	●	●
2. Primary	●	●	●	●	●	●	●
3. Timely	●	●	●	●	●	●	●
4. Accessible	●	●	●	●	●	●	●
5. Machine processable	●	●	●	●	●	●	●
6. Non-discriminatory	●	●	●	●	●	●	●
7. Non-proprietary	●	●	●	●	●	●	●
8. License-free	●	●	●	●	●	●	●

● Yes ● Partial ● Not

Source: Elaborated by the authors.

Regarding the principles to be adopted by OGD initiatives (W3C, 2011, p.14), the adherence of the databases to the principles complete, non-discriminatory and non-proprietary was identified as a major problem. It was also identified the existence of a case where a non-compliance with the Access principle was reported.

Conclusions

Four types of phenomena presented in the studied business models were identified: a) Database Creation using captured or produced data from tool; b) Database Creation to integrate and standardize multiple sources; c) Promote and engage civic monitoring and supervision of public administration; and d) Contribute to improve the use of a public facility

It was also identified that the business models were linked to activities such as public services provision, building of groups around a common theme, socioeconomic development and social participation in public management.

Regarding the activities adopted by the businesses analyzed, it was identified that the resources used and the activities were related to the existence of a database built by multiple

sources that provided standardized data for the product and service offered as the value proposition by the adopted business model. In all cases, it was observed the concern to produce and provide information on mobile applications or websites that could help the customer to solve a problem related to the context (location, time and need).

The revenue generation, key to the business sustainability, was explored in different ways: a) Ads, when the tool has a significant audience for organizations interested in advertising products and services to users of the tool; b) Through partnerships with non-governmental organizations, transferring the activities necessary for the operation of the business model; c) Support of sponsors who want to link their brand or company to the solution, and; d) Consultancy using the knowledge obtained from databases and tools data. Moreover, the availability of additional subscriptions or versions, named by respondents as *freemium*.

In the cases analyzed, the participation of service providers in the value chain proposed by Hughes (2011b) was located in the primary activities of Inputs, Processes and Outputs. In the Input activities, providers have participated contributing to the availability of raw data into formats interpretable by machines, generating repository and new databases. In the Process activity, contributions occurred by base grouping, contextualization and linking data, interpret and data analysis. Last but not least, in the Output activities the providers participated in application development, analysis, production of information and data display on a human-readable format.

Despite the report that the amount of open data initiatives has recently increased, many of the initiatives have not yet adopted the principles and recommendations (W3C, 2011) internationally adopted in projects and opening initiatives of data government. One of the problems found in most cases is the lack of adoption of standards and structure in which data are made available. The lack of documentation and metadata ultimately aggravate this obstacle.

Another problem identified in these cases is the use of proprietary standards or formats that are not machine readable. It is important to highlight that transparency initiatives are not the same as open government data initiatives. The use of standards adopted internationally was identified as a factor that would contribute to the emergence of new business, thus generating new and more products and services that would use open data. Finally, another motivate factor identified is related to using open government obtained from public services.

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