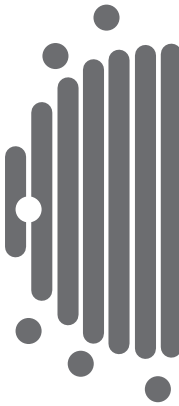
Beyond standards and regulations: Obstacles to local open government data initiatives in Italy and France



The Social Dynamics of Open Data

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Federico Piovesan

Introduction

Despite national and supranational directives and growing interest in the potential of data-driven analysis, the majority of local public administrations have failed to implement progressive open government data (OGD) agendas. The aim of this study was to collect anecdotal evidence about how local public administrations (PAs) in Italy and France have initiated OGD agendas, what difficulties they have encountered, and how they have tackled them.

The study was motivated by the idea that 'open data needs to go local' (World Wide Web Foundation 2015). The research conducted attempts to shift the focus beyond the 'usual suspects', namely legal and technological issues, to include a perspective that looks at the individuals that are supposed to implement the OGD agendas, and at their inter- and intra-office interactions within local PAs.

A preliminary framework is proposed to help inform the empirical research by offering a common framing to the diverse experiences discussed both in the literature and interviews. The framework is based on interdisciplinary literature that integrates two concepts from evolutionary economics, namely routines (Coriat & Dosi 1995) and satisficing (Simon 1955) with the open data dynamics model (Helbig et al. 2012) and the multi-level perspective from science and technology studies (Martin 2014).

Following the presentation of the framework, the literature is reviewed – covering a wide range of legal, social and technical obstacles that hinder OGD agendas – and observations gleaned from 14 interviews about local OGD initiatives in Italy and France are presented. While anecdotes are far from being a complete representation of reality, they may nuance our understanding of the dynamics involved in changing information management within public administrations.

Both Italy and France have national OGD agendas with dedicated agencies in charge of drafting and implementing reforms. At the time of writing, France's national ranking in terms of open data was higher than that of Italy.[1] However, the research presented in this chapter shows significant differences between PAs within both countries, which suggests that national benchmarks partly overlook the intricate dynamics underlying each initiative.

OGD implies restructuring how public employees collect, process and archive data, as well as how PAs manage and share information. This chapter explores seven issues interfering with the successful implementation of OGD agendas: privacy, data ownership, economic obstacles, interoperability, release order, real-time data, and lack of resources.

Three main findings emerge: the impact of cultural factors on organisational change; the need for more research about implementation costs, the economic and social impact of OGD, and privacy issues; and the disregard for the perspectives of users.

The chapter starts by introducing the theoretical framework and the methodology. It then reports on the empirical findings (stemming from the comparison between literature and interviews) before moving on to a discussion of the study's key findings. The chapter ends by highlighting the limitations of the approach before concluding.

Theoretical framework

The theoretical framework adopted is composed of an interdisciplinary set of concepts that attempt to include the perspectives of relevant stakeholders; address the diverse dynamics that regulate their interactions; and account for the context in which OGD initiatives are embedded.

After providing a working definition of OGD, two concepts are introduced – routines and satisficing – that describe how public organisations and employees can interact with the changes in habits and procedures required by OGD agendas. In the following section, the open data dynamics (ODD) model by Helbig et al. (2012) discusses the activities and forces that surround OGD supply. Finally, this section borrows from Martin's (2014) multi-level perspective to frame the evolution of open data dynamics within their socio-political context.

OGD is public sector information (PSI) that has been released online in compliance with the open definition. According to the European Commission (2003) PSI, includes 'any content whatever its medium (written on paper or stored in electronic form or as a sound, visual or audiovisual recording) when produced by a public sector body within its mandate'[2] or, in other words, a

1 Based on the 2015 editions of the Global Open Data Index (http://index.okfn.org) and of the Open Data Barometer (http://opendatabarometer.org).

2 The original PSI directive excluded 'documents held by public service broadcasters and their subsidiaries […]; documents held by educational and research establishments […]; and doc-

common repository of knowledge whose collection, management and archival is largely financed through tax-payer money.

Making PSI available online is important for ethical and practical reasons since OGD can fuel social and economic innovation. Indeed, there are mainly four dimensions that are usually covered in the literature and raised by OGD advocates (see, for example, Davies 2010, Davies & Bawa 2012, Gray 2014, Janssen et al. 2012). The first is transparency, since open public information provides access to indicators of government performance. Second, OGD can foster positive economic spill-over as it fuels the market for data-driven products and services, which can promote entrepreneurship and employment. The third reason is improved efficiency as PAs are likely to be the first re-users of OGD in order to improve resource allocation and make public services more effective. Finally, OGD can be a tool for citizen empowerment thorough co-design, co-creation and co-development of innovative responses to public needs. As Gray (2014) observes, however, usually 'social justice, equality and other values take the backseat' in high-level political speeches, official communications and policy documents about OGD. Nevertheless, related initiatives are often considered as a building block of open government practices (Lee & Kwak 2012).

Routines and satisficing

Both routines and satisficing come from evolutionary economic theory. While the former describes the recurrence and evolution of practices within organisations, satisficing frames sub-optimal decision-making as a product of bounded rationality.

Nelson and Winter (1982) used routines as the unit of analysis in their theory of economic change. Over the years, routines have held many 'complementary yet different meanings in economics and business literature' (Becker 2003). This research draws from Coriat and Dosi (1995), whose conceptualisation presents two characteristics useful to the research. First, routines are inherently collective, as opposed to the individuality of habits. Second, routines have a double nature since organisations use them to learn how to undertake tasks and solve problems while also employing routines as a tool to govern and coordinate.

Coriat and Dosi (1995) sought to understand why so-called 'superior' organisational forms[3] diffuse slowly (or not at all) within industries and across countries. 'Firms are crucial (although not exclusive) repositories of knowledge' and routines are the building blocks of their competences; hence 'competences do not only involve problem-solving skills concerning the relationship between

uments held by cultural establishments […].' Details may change in subsequent versions and national directives.

3 The paper examined built on a number of previous studies that investigated a variety of private companies whose 'superiority' was defined in terms of higher competitiveness and innovative outputs.

the firm and the outside environment, but also skills and rules governing internal relationships' or, in other words, competences emerge from the consolidation of collective routines (Coriat & Dosi 1995). Moreover 'firms are behavioural entities embodying specific and relatively inertial competences, decision rules and internal governance structures which, in the longer term co-evolve with the environment in which they are embedded' (Coriat & Dosi 1995: 11). It follows that the problem-solving and governance routines that form an organisation's competences cannot be transferred easily to other organisations due to what the authors call 'partial tacitness', namely the complexity of absorbing 'inertial competences' that emerged and evolved over time within a specific environment (Coriat & Dosi 1995).

Coriat and Dosi connect the resulting inflexibility to literature on path-dependency and lock-ins (for example, the work of Freeman 1982, Rosenberg 1985, Dosi et al. 1988, Saviotti & Metcalfe 1992). For this study, public administrations that do not operate in competitive markets and are subject to centralised forms of control – meaning that routines in local PAs can be influenced by directives from national agencies – are not included. Routines are expected to prove valuable in explaining heterogeneous performance across local administrations because centralisation and lack of competitiveness may hinder an organisation's capacity to change routines and thus build new competences.

While routines can help explain barriers to innovation within an organisation, satisficing frames the habits of individuals and the challenges involved in changing their daily routines.

Simon (1955) used satisficing to explain decision-making in circumstances where there is no clear optimal solution. The word comes from the combination of satisfy and suffice, and thus represents a compromise between the best solution and the available cognitive resources. Simon referred to bounded rationality to describe how individuals are most often unable to evaluate all potential outcomes with sufficient precision because they do not know the probability of each outcome and possess only limited memory. For this study, insufficient data literacy and/or skills, lack of time, or unwillingness to change one's habits can affect the development of OGD agendas because workers may satisfy when complying with data-related practices.

To provide some concrete examples with respect to the literature on OGD, in their case studies, Helbig et al. (2012) highlighted elements of reluctance to change, low willingness to share information, risk aversion, power dynamics and internal conflicts. Wirtz et al. (2016), on the other hand, used a cognitive science approach to explore cultural barriers to OGD implementation in Germany. They examined five barriers and concluded that the most influential ones were risk aversion from public – which can be related to a low willingness to step out of defined routines – and the potential damage that increase transparency may bring to the administration.

Open data dynamics

Helbig et al. (2012) describe the dynamics surrounding OGD as an information polity: 'a collection of stakeholders, data sources, data resources, information flows, and governance relationships involved in the provision and use of government-held and non-governmental data sources.'[4]

The OGD information polity is composed of knowledge stocks, information flows and feedback loops. Knowledge stocks are entities that accumulate or deplete over time. Information flows, on the other hand, define the rate at which a stock can change, and are influenced by a variety of factors that entail various activities, some more objective than others.

On one side of the spectrum lies automated data collection, for example when electronic devices send temperature measurements to a weather database. On the other end, there is collection that relies heavily on the collector's judgement, such as medical data on a patient's mental status. It follows that 'usability of data, or its fitness for use, depends in large part on the nature of the encoding processes and data management practices' (Helbig et al. 2012).

Data owners exercise governance on their respective sources – i.e. the data they collect – and resources – i.e. the devices and infrastructure used to gather, store and retrieve knowledge. Owners also hold the responsibility to make information 'fit-for-use' before they publish it online, which entails anonymisation; removing meaning conflicts (i.e. describing data in a way that is understandable to people lacking the domain knowledge of public employees, including technical jargon); and being mindful of the adverse consequences that may damage data providers and/or users, or result in pressures to hide data.

While data owners exercise governance on their data and infrastructure, public institutions also exercise governance on the information environment – namely the 'different contexts from which data is extracted, encoded, and otherwise made visible'. Governance involves 'formulating policies; initiating social and technical processes; regulating standards, meaning and interpretation; and adding value' (Helbig et al. 2012).

Moreover, governance can be reciprocal: providers affect users through data provision, incentives, sanctions and persuasive methods, but users can affect governments through political processes and direct participation in decision-making (for example, through advocacy, shifts in consumer behaviour or social mobilisation).

This reciprocity of both information flows and governance reinforces the notion that stakeholders should strive for mutual collaboration.[5] Dawes (2010) considers

4 Data resources are defined as the tools (such as software, networks, platform, and organisational arrangements) that a data-holder uses to provide data.

5 Chignard (2009) introduces three concepts to describe the public perception of society with respect to OGD and government. The *famille liberale* considers the opening of public information as a mean for civil society to press the public sector and to promote economic actors. The *famille*

stakeholders in an information polity as stewards of primary (governmental) and secondary (non-governmental) data sources, who 'share responsibility for data accuracy, validity, security, management, and preservation' – in other words making data 'fit-for-use' can be a collaborative endeavour between primary and secondary users.

Finally, Helbig et al. (2012) introduce feedback loops as a significant process of open data dynamics. Feedback loops contain endogenous knowledge that travels through the system and that, through iteration, can influence future actions. A loop can be reinforcing when it tends to strengthen its initial input, thus leading to the growth or collapse of a specific set of practices. On the other hand, balancing loops counteract the initial action and resist change.

One way to initiate feedback loops is to engage external actors (i.e. secondary users). Most studies examined in my review, however, do not mention the importance of systems to collect and react upon feedback from secondary users who, on the other hand, could help by signalling mistakes and missing observations or support data maintenance.

Open data advocates often claim that sharing public knowledge will lead the community of potential re-users to propose innovative solutions, unthinkable if information was kept under some form of restricted access. Hellberg and Hedström (2015) confronted this idea in their sixth myths of open data:[6] 'the myth of public interest in the reuse of open public data. The open government agenda, as well as research on open data, often takes citizen interest in open data for granted. We believe that not everyone is interested in using public data, even if they have the necessary resources and competences.' However, as Zuiderwijk and Janssen (2014) point out, there is need for more research focusing on the perspective of users.

Multi-level perspective

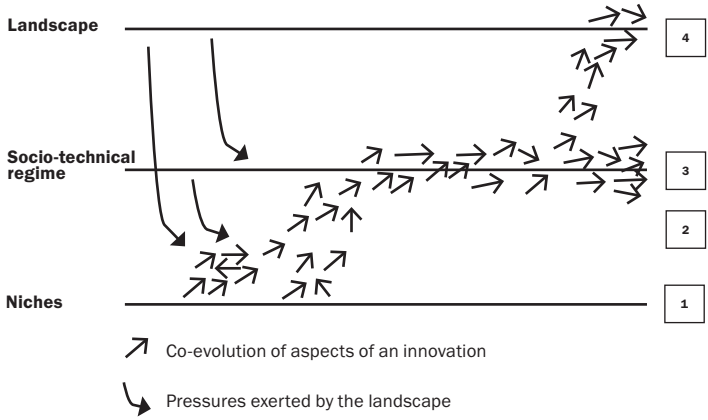
The multi-level perspective (MLP) was originally developed in science and technology studies to describe the diffusion of innovations in complex socio-technical systems.[7] Figure 1 shows how innovations can be conceptualised as aggregates of factors that simultaneously co-evolve through different levels of diffusion – from niches to the landscape level – while facing resistance from the current status quo.

liberale-libertaire sees OGD as a mean for citizens to exercise their right to inspect and control the public sector, which is generally seen as flawed and corrupt. Finally, the *famille participative* sees open data as an opportunity for citizens to collaborate with, rather than oppose, the public administrations.

6 They refer to the work of Janssen et al. (2012) who advanced the other five myths.

7 Geels (2002), for example, applies it to the transport sector when analysing the shift from horse-drawn carriages to automobiles. More recent research uses MLP to imagine possible trajectories from our current carbon-intensive system to one where renewable energies are predominant (for example, Foxon et al. 2010, 2013).

Figure 1 Multi-level perspective



Source: Martin (2014)

Innovations develop in niches, outside the mainstream and are mainly supported by far-sighted groups and individuals. As they diffuse more widely, innovations approach the socio-technical regime, which is defined by prevailing technologies, rules and practices. Finally, the landscape level consists of super structures, rules (both normative and explicit) and artefacts that are deeply embedded in the fabric of society – such as prevailing political ideology, institutions, economic paradigms and socio-cultural values.

While previous sections discussed the nexus between stakeholders, information stocks, contextual pressures, and reinforcing or balancing dynamics that form the OGD ecosystem within each organisation, the MLP frames how the evolution of such ecosystems interacts with external forces, where system stability and innovation result from dynamic interactions of social and technical factors within and between each level (Martin 2014).

Within the limited temporal scope of this study, OGD in local public administrations most likely exists within niches and one would not expect to observe a significant evolution through these levels. Martin (2014), however, referred to resistance to innovation coming from the landscape level since OGD can be considered as a 'disturbance to existing practices, in that they alter some combination of technical, political, and social factors that influence governance'. Hence, the MLP was used to frame pressures (such as economic and political ideologies) that guide individual decision-making without being part of internal policy or management guidelines.

Methodology

For this study, a literature review of previous empirical studies covering PAs in different European countries is combined with observations gleaned from 14 interviews with individuals involved in OGD initiatives in Italy and France.

Empirical studies were examined and selected between November 2014 and February 2015. Four studies in particular presented a collection of obstacles categorised according to the authors' own criteria, as show in Table 1. To aid comparison with data collected during the interviews, the last column reports the categories (each labelled with a number) used to classify obstacles in the study. None of the studies was about Italy, and only one includes a French case.

Table 1 Summary of previous studies

Author(s)	Countries	Methodology	Obstacle Categorisation
Janssen et al. 2012	NL	Literature; interviews; workshops	[1] Institutional; [2] Task complexity; [3] Use and participation; [4] Legislation; [5] Information quality; [6] Technical
Martin et al. 2013	DE, FR, UK	Case-study (DE, FR); literature analysis (UK)	[1] Governance; [2] Economic issues; [3] Licence and legal framework; [4] Data characteristics; [5] Metadata; [6] Access; [7] Skills
Barry & Bannister 2014	IR	Literature review; interviews	[1] Economic; [2] Technical; [3] Cultural; [4] Legal; [5] Administrative; [6] Risk-related
Martin 2014	UK	Survey	[1] Digital technologies; [2] User practices; [3] Public management; [4] Institutions; [5] Resources

Interviews took place between February and April 2015. Previous to that, the researcher took part in two public events dedicated to OGD. The first was *Spaghetti Open Data 2015* in Bologna, Italy, and the other was *Infolab*, organised by the Paris-based think tank *Fondation Internet Nouvelle Génération* (FING). Attendance allowed the researcher to familiarise himself with the OGD communities in both countries.

The aim was to interview people who worked for or collaborated with public administrations that implemented OGD agendas or were in the process of doing so. To approach interviewees, the researcher used a combination of email questionnaires and snowball sampling. First, an email was sent to all the contacts gathered during the two events, introducing the research goals and presenting a short questionnaire. Some initial questions were used to collect information on each respondent's job, affiliation and role within their organisation.

Both at the beginning and at the end of the questionnaire, respondents were offered the opportunity to discuss each question in more detail during an in-person interview or a call (either through phone or Skype). Finally, at the end of

an interview, each respondent was asked whether they knew other people who could be contacted.

Table 2 provides the final list of participants, their nationality, a letter to identify them in the following sections, and relevant information about their organisation, job position and OGD initiative. While the sample is relatively small and more interviews were conducted on the Italian case, all respondents had enough experience within their organisation to be considered as qualified respondents.

One semi-structured interview was conducted per participant, during which respondents were asked to share their experiences about their local OGD project. The aim was to gather specific knowledge on their information sharing procedures; the obstacles encountered during OGD campaigns; and (when applicable) how these were addressed or what strategies each interviewee would suggest. Each interviewee was allowed to steer the conversation to prevent bias on the part of the researcher and to avoid any suggestion on relevant obstacles, though this approach may have limited the number of issues discussed (this and other limitations are presented below). Finally, each participant was asked to confirm the statements included in a draft version of this text one month after being interviewed.

Table 2 List of participants in the order they were interviewed

Country	Code	Role	Organisation's function	Scope	Age of OGD programme
IT	A	Dispute office	Collect taxes and revenues	Municipality < 100,00	None
IT	B	Administrative	Social security	Municipality < 100,00	3 years (March 2012)
FR	C	Head of OGD division	Think tank	-	Not relevant
IT	D	Head of IT services	Local government	City < 400,000	4 years (2011)
IT	E	Programme manager	Public ICT service provider	Province > 500,000	3 year (2012)
IT	F	IT Director	Environmental protection	Region	Not yet started (end of 2015)
IT	G	Researcher	Scientific research	National	5 years (2010)
FR	H	Innovation and R&D manager	Telecommunications	International	10 years (2005)
IT	I	Head of innovation management	Local government	Municipality < 15,000	1.5 years (late 2013)
IT	J	Manager of OGD initiative	Local government	Province > 500,000	3 years (2012)
FR	K	Director of OGD Initiative	Local government	Province > 1,500,000	2 years (early 2013 + 1-year pre-phase)
FR	L	Director of OGD Initiative	Local government	Region < 7,000,000	4 years
IT	M	Director of Open Data	Local government	City > 600,000	2 years
IT	N	Consultant, PhD in privacy and cyber security	Consultancy, research	Province > 500,000	3 years (2012)

Findings

Seven categories of obstacles emerged during the interviews: privacy, data ownership, economic obstacles, interoperability, release order, real-time data and lack of resources. Each of them was mentioned by at least two interviewees and all but one (i.e. real-time data) were also found in the four empirical studies presented in the previous section.

Following Zuiderwijk and Janssen (2014) there was an expectation to find those high-level impediments mentioned in the literature and more detailed anecdotes from the interviews. Hence, findings were combined by providing in each of the following sections a summary of the literature (as tables) and a discussion of the anecdotes collected through the interviews. The former are discussed in more detail when complementary with the discussion prompted by the latter.

Privacy

Table 3 Literature review of obstacles relating to privacy

Janssen et al. 2012 [1] Unclear trade-off between public values [4] Privacy violation [4] Security	Martin et al. 2013 [3] Personal data and privacy [6] Need to identify	Barry & Bannister 2014 [6] Data protection
Martin 2014 [3] [4] Government organisations face challenges balancing privacy concerns with the public interest when opening up data [1] [3] [4] Government organisations face legal barriers, such as data protection law, that prevent the opening up of data		

Almost all respondents considered privacy to be a key obstacle to their initiative. For example, D and G mentioned two examples related to educational data. The former, who works in a small-town PA, needs data from the Ministry of Education to offer basic services to students and their families. The latter, on the other hand, works in a publicly-funded research centre and is captivated by the potential of big data from schools and online education platforms. However, neither one can access educational data due to privacy regulations.

'Privacy can be a double-edged sword,' explained N, a cyber-security researcher that offers consulting services to his local PA. 'Think for example of an open business registry with information about restaurants that include their owners' names. While restaurant being included means that owners renounce some of their privacy, they may care more about free advertisement from a mobile

application about local restaurants. However, that same data could be aggregated with other information (for example, from social networks) that may lead to unforeseen privacy violations, like targeted marketing.'

E argued that privacy is sometime used as a smoke screen to avoid data opening. For instance, his office does not publish the list of recipients of social aid as open data, although the law does not consider it sensitive information and that same list is published in PDF format.

When it comes to privacy, usually local administration does not exercise much governance on the information environment: national and supranational institutions are the ones that influence policy. Data owners, on the other hand, are responsible for properly anonymising whatever data they make public.

Three interviewees (D, G and J) affirmed that their OGD platforms are currently unfit to host sensitive information. In their opinion, platforms should allow restricted access to specific datasets so that only public employees or third parties that abide by non-disclosure agreements (such as researchers) would be able to re-use that information.

Solutions (or compromises) must account for several variables (like the type of data released) and allow for flexible opt-in and opt-out possibilities. OGD portals that allow public-worker identification can help to hide sensitive information from the public but sound cybersecurity would still be necessary since data will be vulnerable to attacks once it is released.

According to N, however, solving simultaneously the legal and technical nature of privacy issues is not sufficient: 'the very architecture of the Internet makes this a trans-disciplinary problem. Currently there is no clear answer: you either renounce a part of your privacy or refrain from sharing the information.'

Data ownership

Table 4 Literature review of obstacles relating to data ownership

Janssen et al. 2012	Martin et al. 2013
[1] Emphasis of barriers and neglect of opportunities	[1] The relevant administrative level
[2] Duplication of data, data available in various forms, or before/after processing resulting in discussions about what the source is	[3] Licence is not open enough
[3] Threat of lawsuits or other violations	[3] Heterogeneous licenses across datasets
[4] Dispute and litigations	[3] Stacking of rights
[5] Lack of information	[3] Rights on data already engaged
[5] Lack of accuracy of the information	[3] Rights on data are stacked
[5] Incomplete information, only part of the total picture shown or only a certain range	[3] Legal framework concerning data in general
[5] Obsolete and non-valid data	[3] Intellectual property
[5] [Essential] information is missing	[3] Not uniform licences
	[4] Decrease in the quality of data
	[4] Data are dependent on the state
	[7] Misinterpretation of data

Barry & Bannister 2014 [4] Litigation and liability [5] Security [6] Abuse and fraud [6] Misinterpretation [6] Errors [6] Consequences	Martin (2014) [1] [3] Government organisations do not have comprehensive data inventories, and so face challenges in identifying the data they could make open [3] Individuals and groups within government organisations perceive significant risks of open data being misused [1] [3] Individuals and groups within government organisations view many existing datasets as poor quality and unsuitable for making open [1] Limited interoperability between ICT systems impedes the release and use of open data [1] [2] [4] Potential open data users will be more concerned about the stability and quality of open data

Five participants (D, I, J, K and M) mentioned opaque data ownership as an obstacle. G's public research centre, for example, faces issues related to data ownership when publishing research based on information sourced from different organisations. 'When we publish a map of seismic risk across Italy – which is composed of different layers of information coming from several organisations – the result of our work should be published as open data. However, we can only share the aggregate map because each of the layers that make up the map was not released as open data. The other option would be to draft an individual agreement with each original data owner,' he explained.

Another interviewee discussed how data ownership is inevitably connected to responsibility and how organisations will bear any adverse consequences that may derive from opening certain datasets. 'This can be a huge deterrent to release' said F, who works for an environmental monitoring agency, while explaining how geo-referenced data can lead to unpleasant consequences when, for instance, higher pollution levels are observed on or close to private land. Regardless of validity, land owners that consider that data as harmful may sue the organisation that published it. 'Things are even more complicated when companies own the land,' he added.

Uncertainties about data quality and resulting legal repercussions can be used as a smoke screen to prevent information release. 'In my experience risk aversion is a stronger deterrent than loss of power over valuable information,' said J, who proposed a 'best-effort policy for newly published data-sets', according to which PAs have an initial period where the adverse consequences of improperly published information are less burdensome.

According to Conradie and Cohenni (2014), ownership is affected by hierarchy of data storage, data collection practices, and use of data. Public agencies may use data that is key to their function but was not produced internally – i.e. they are primary re-users of another organisation's data. It may then be unclear who owns the information that the PA may eventually derive from that data.

J and E both suggested that a system for inter-agency data requests could address the reticence to publish due to opaque or partial ownership. On one hand, inter-agency communication would clarify opaque ownership while written agreements would distribute liability. On the other, it would also provide a good starting point for linking databases.

In K's organisation, it is assumed that all information should be published and each office evaluates the legal fitness of their datasets. Class A data presents no risk; class B presents unclear risks (and is therefore published in formats that do not easily lend to machine processing like PDF and DOC); and class C data presents substantial risk and is not made available. Datasets are then passed onto the president's office, whose final approval is necessary in any case.

'By categorising risks before release, our managers can focus only on problematic datasets,' he explained. In K's case, new routines were introduced to distribute governance on primary sources (namely data produced by the organisation) throughout different offices, though this remained an isolated case across both the literature and the interviews.

Economic obstacles[8]

Table 5 Literature review of economic obstacles

Janssen et al. 2012 [1] Revenue system is based on creating income from data [1] Fostering local organisations' interests at the expense of citizen interests [3] Having to pay a fee for the data	Martin et al. 2013 [2] Sustainable business model for the production of data [2] Endangering the business model of companies already re-using the data [2] Inappropriate pricing for re-users [2] Endangering current business model of administration [4] Formats require proprietary/paying software [7] Privatisation of benefits
Barry & Bannister 2014 [1] Fees and funding	
Martin 2014 [1] [3] [5] Government organisations that open data can no longer use the data as a bargaining tool with other organisations [3] [5] Government organisations will lose financial income by opening up data, as they currently generate revenue from some data	

Most examples related to economic obstacles discussed during the interviews were connected to datasets characterised by high potential for re-use,[9] with Italian respondents unanimously agreeing that there were *de facto* blocks to the

8 The obstacles discussed in this section relate to the resistance towards an economic model based on open knowledge as opposed to intellectual property rights. Problems related to lack of financial resources are discussed below.

9 All are included in the list of valuable data by the Open Data Index (http://index.okfn.org/dataset/).

release of datasets such as cadastral data (owned by the Land Registry Office), company registries (Chamber of Commerce) and income data (Tax Revenue Office). In France, only the company registry was not open at the time of the interviews (OKFN 2014).

J gave an example about public transit data, the opening of which proved extremely laborious due to incumbent agreements between her municipality's transport office and a private company that planned to use that data for their services. Eventually the agreement was renegotiated and the data released.

E had a similar experience with meteorological data: while his administration was committed to release meteorological data, the adjacent province (which shared the meteorological station with E's municipality) was committed to protect its business models based on the sale of weather data to private companies. 'As long as private companies are willing to pay for PSI, things will hardly change' he added when talking about location data (including postal codes which are open in France but not in Italy). D shared her own example about cadastral data, for which her office 'had to undergo long negotiations before obtaining a one-time bulk download from the local Land Registry Office, though nothing could be agreed about updates'.

On K's platform, all data can be accessed for free. However, 'there has been an internal debate for some time now about whether we should charge for high-resolution pictures from the local museum's artworks'. In K's opinion, it was unclear whether potential revenues would be worth the cost of setting up a sales infrastructure to monetise on the interest of art enthusiasts. H faced similar doubts when explaining how his 'organisation's first attempt to engage with open data failed because, not understanding the value of reuse, we asked customers to pay for it'.

In E's province, the PA can manage cadastral data independently and thus could experiment with an alternative model. Since the change, everyone can access a 'basic' datasets through the province's OGD portal that is updated every six months. Users who need 'valuable' documents, on the other hand, still need to request them through conventional means (at a price).

By introducing a new routine, and challenging the conventional model that prioritises revenues from PSI provision, E's organisation reduced the volume of requests that its employees must handle while allowing them to focus on those users who were more likely to pay: 'After an initial investment – mainly for quality checks on the first dataset published – resources were diverted to more profitable activities.' E underlined how this 'resulted in a positive impact on our agency's revenue'.

Economic obstacles are prominent both in the literature and interviews. They include some of the most significant barriers to openness because they involve multifaceted issues that are connected to each socio-political context. For example, strong reluctance to publishing an organisation's information may be

due to perceived risks to their current funding model and/or control and power over valuable information.

Interviews show how reluctance may be due to consolidated routines promoting the idea that sharing one's knowledge can lead to loss of revenue, or how incumbent public–private partnerships complicate or impede opening PSI. While in the former case resistance comes from the landscape level, the latter shows substantial obstacles (namely a commercial contact) that exist at the socio-technical level. And while one may be overcome through a shift in political will, the second requires innovative models such as the model experimented with in E's organisation. E's experimentation initiated a feedback loop that resulted in a positive impact on the organisation's allocation of resources. One cannot ignore, however, that it was made possible by a mix of willingness to experiment new routines and models of data governance that most Italian PAs, who do not own cadastral data, would not be able to replicate.

Benefits from experimentation, however, may not always be so clear, as shown in K's and H's experiences. Case studies could help compare returns and costs of managing a sales infrastructure, thus highlighting benefits and risks of data opening according to data type and organisational arrangements.

While political will is necessary to overcome reluctance and to define data ownership in a more transparent way, some datasets are more expensive to maintain than others. Agencies could charge for curated datasets with legal value or APIs, while experimenting with electronic payments might induce reluctant agencies to consider data release (and also reduces the costs of maintaining the sale infrastructure).

Interoperability

Table 6 Literature review of obstacles relating to interoperability

Janssen et al. 2012 [1] No uniform policy for publicising data [2] Duplication of data, data available in various forms, or before/after processing resulting in discussions about what the source is [3] Registration required before being able to download the data [4] Prior written permission required to gain access to and reproduce data [6] Fragmentation of software and applications [6] Legacy systems that complicate the publicising of data	Martin et al. 2013 [1] Inconsistency in public bodies [1] Risk of quartering: States/greater region/ Europe [3] Restrictive access [4] Data available in heterogeneous formats [4] Only part of data is available [4] Data buried in silos [4] Incompatible with other data [4] Incompatibility with other applications [5] Lack of single standard to describe datasets [5] Lack of consistent standards [6] Balance between free access and the need to know the use of data [6] Need to register [5] Metadata unstructured
Barry & Bannister 2014 [2] Standards [4] Legislation [4] Licensing	

According to interviewees, lack of interoperability stems mainly from two problems. The first relates to outdated ICT infrastructure and incompatible software hindering data exchange. The second relates to heterogeneous bureaucratic procedures that can slow down daily exchanges of information, with offices bearing most of the consequences.

For A – who works in a local branch of the national tax authority – getting basic information such as a citizen's address (held by the local municipality) can take from a few hours to several days: 'It really depends on who picks up the phone.' Information is then sent via fax or PDF, and A needs to extract it manually. His agency has lost ongoing legal disputes due to delays in similar exchanges.

B works for the national social security agency and often needs to exchange information with the tax authority.[10] The flow of information works well from the social security agency to the tax authority while the other way around is 'complex and time-consuming' (and to her knowledge, no one can really explain why).

Another aspect that emerged is a lock-in with ICT service providers. Many Italian PAs outsource their IT software and service to in-house companies.[11] According to J 'if you want to change your information management structure you must take these businesses into account' who hold key knowledge about the PA's ICT infrastructure and whose contract with the public sector is often vital to their business.

Different publishing practices can also be an issue. With budget data, for instance, most PAs employ different layouts that hinder comparability and thus the re-use of such information.[12] One respondent also mentioned the risk of quartering between big urban centres and smaller cities while two more argued that data from smaller urban centres has low value unless it is aggregated with that of adjacent cities.

What emerges from the interviews is that interoperability will remain a complicated goal as long as OGD practices and technical standards do not reach a stable socio-technical regime. Most participants agreed that updating or changing software is hardly considered a priority in their PA and, while open source solutions (like CKAN) are free and allow customisation, implementation still requires time and trained personnel.

Incumbent agreements with ICT providers cannot be ignored: J's example shows socio-technical practices in the public sector can also be contrary to what one would expect from organisations influenced by market logics (cf.

10 INPS (the social security agency) provides *Agenzia delle Entrate* (tax authority) with information on workers' contracts and their duration, which are used to verify whether company revenues correspond to the human capital they employ. On the other hand, the tax authority gives INPS income data, which is used to verify that social transfers match earnings.

11 In-house companies are financed with public money while being managed as private companies (for example, their shares are traded on the stock market, hence they must be profitable).

12 To create the *Open Bilanci* platform (http://openbilanci.it) 'several expenses had to be harmonised and aggregated in order to allow for historical and geographical comparisons' (Openpolis 2014).

previous section). Hence, interoperability is not only a matter of homogeneity in technological standards that can be overcome mainly through software updates. It can also be hindered by a tradition of public agencies with diverse internal routines and whose communication regimes with other administrations vary considerably.

For these reasons, the implementation of OGD agendas might vary across municipalities and guidelines should nudge towards open and sustainable practices while accounting for differences in resource availability. OGD advocates (both internal and external ones) could take a mediating role on both technical and communication matters between ICT departments and/or providers and data-owning offices. While the latter may lack data processing skills, they possess domain knowledge that can promote re-use, for example, through meaningful metadata. In J's opinion 'we are facing a paradigm shift and a generational shift simultaneously: old and new should collaborate, and probably need to be protected from the logic of the market'.

Release order

Table 7 Literature review of obstacles relating to release order

Martin et al. 2013 [1] Public policies not consistent	Martin 2014 [1] [3] Government organisations own large amounts of data and so face capacity challenges when reviewing, releasing, and maintaining open data [3] [5] Government organisations lack a coherent vision for funding open data and promoting open data use
Barry & Bannister 2014 [5] Policy	

In K's organisation employees have to categorise datasets before opening them; data is then released according its degree of risk. In J's administration, on the other hand, each office was asked to publish at least one dataset (they could freely choose which) to let employees familiarise themselves with the new routines involved in data release. Consequently, they focused on ownership and liability issues on a case-by-case basis, which in some cases slowed the process down but allowed intra- and inter-office knowledge transfers that were valuable in subsequent experiences.

The two other interviewees discussed data priority work in organisations that publish fewer data types. While in G's public research centre releasing data is part of their mandate, there is no plan (to his knowledge) to release administrative data. F (who works in an environmental monitoring office) explained that 'in my experience, it is better to start with data from electronic sensors; then move onto data that needs to be validated in a laboratory; and finally data about checks on areas that include private land'.

There is little discussion about data priority in the literature, and only four respondents addressed this problem – but it could be useful, especially for PAs who approach OGD for the first time, to have guidelines on which data to open first. E proposed data catalogues – listing all the information agencies hold and what they can release as OGD – as a potential solution to help PAs understand where to focus their efforts in early phases. These may also represent an opportunity to categorise data according to its risk; pilot projects with non-problematic data could allow employees to familiarise themselves with OGD routines while avoiding risk. While the first phases are most demanding in terms of cost and effort, maintenance and updates also require resources. E mentioned how the 'most downloaded datasets eventually become the better-curated ones'.

Real-time data

While three interviewees mentioned this issue, none of the examined papers from the literature discussed it. F talked about issues with water-level monitoring, arguing that releasing data in real-time may lead to unforeseen consequences, such as faulty sensor signalling imminent emergencies and panic spreading before the agency can confirm accuracy. G referred to similar issues when talking about data from the National Institute of Geophysics and Volcanology. Finally, E talked about highway traffic data and explained how data from sensors in Italian highways is published once a year, thus preventing a wide range of meaningful re-uses.

Although previous literature does not discuss real-time data, the volume and relevance of information whose collection is automated through electronic sensors will increase as the number and variety of devices expands. As 'smart city' initiatives become more prominent, electronic sensors will be used to measure, among others, traffic (both human and vehicles), resource consumption and environmental data in both urban and rural areas (Greenfield 2013).

The examples discussed in the interviews show how different data sources require appropriate contextualisation and legal framing. Agencies may refrain from data release due to potential meaning conflicts or wrong observations. In some instances – as with sensors that can signal imminent emergencies – fear of legal repercussions could obstruct important innovations such as automatic monitoring.

F thinks that 'real-time data could be published with a 24-hour delay, leaving time for human validation before releasing any information'. In case of emergency, the administration would have time to take preventive action before informing citizens. E proposed a more open solution, saying that PAs could involve citizens in monitoring data validity. Hence, real-time data could be accompanied by a disclaimer alleviating the PA's responsibility for faulty sensors, while validated data would be released after official confirmation.

Lack of resources

Table 8 Literature review of obstacles relating to lack of resources

Janssen et al. 2012 [1] No resources with which to publicise data (especially small agencies) [2] Lack of ability to discover the appropriate data [2] Focus is on making use of single datasets, whereas the real value might come from combining various datasets [3] No time to delve into the details, or no time at all [3] Unexpected escalated costs [3] No time to make use of the open data [3] Lack of the necessary capability to use the information [3] No statistical knowledge or understanding of the potential and limitations of statistics [5] Unclear value: information may appear to be irrelevant or benign when viewed in isolation, but when linked and analysed collectively it can result in new insights [5] Too much information to process and not sure what to look at [6] Data must be in a well-defined format that is easily accessible: while the format of data is arbitrary, the format of data definitions needs to be rigorously defined [6] Lack of meta standards [6] No standard software for processing open data	Martin et al. 2013 [2] The cost of opening data [2] Benefits and return on investment [1] Devolution: fragmented resources [2] Lack of cashable savings [2] Implementation costs: hardware and software [5] Incomplete metadata [5] Not enough information on data formats [7] Language barrier [7] Unfamiliar with metadata [7] Need of domain expertise
Barry & Bannister 2014 [1] Resource constraints [2] Technical capacity	Martin 2014 [5] The absence of an evidence base demonstrating the value of open data makes it challenging to create compelling business cases for open data projects [3] [4] Government organisations are not empowered to develop markets for open data [1] [3] [5] In government organisations delivering open data the IT costs are high [3] [5] There are limited efforts and resources dedicated to promoting open data to potential users [3] [5] Potential open data users lack the specialist knowledge required to interpret the data [1] [5] Government organisations lack the expertise in the technologies required to deliver open data [3] [5] The business case for open government data projects must be made within the context of reductions in public spending and the scope of public services

Three types of resources were discussed during the interviews: financial resources; technological resources (more advanced software, hardware and network infrastructure); and human resources (including skills and willingness to invest effort in OGD activities). These often overlapped: for example, several Italian interviewees confirmed that a prolonged under-investment in technological infrastructure led to slower machines, outdated software and, more importantly, technicians unaccustomed to technologies necessary to set up and maintain OGD platforms.

K had an arguably atypical experience: 'Our office had a substantial budget that we could use to hire an external consulting company that helped define and

plan key aspects of our initiative'.[13] While in his opinion this approach delivered satisfactory results, its cost may not be sustainable for most public agencies, especially small organisations whose budgets are fiscally constrained by an austerity-led socio-political regime.

E and J's agency followed a different strategy with less ambitious goals, namely starting by opening one dataset per office, as described above. Although they incurred lower costs (around a tenth compared to K's programme) problems had to be dealt with as they emerged, resulting in more resources being invested in their OGD project.

M's experience is at the opposite end of the spectrum with respect to K's. His local OGD initiative was set up by volunteers: 'Thanks to the ongoing development of open source software, widely applicable legal tools, and open guidelines we had the necessary tools to set up a platform based on sustainable standards that will result in lower adaptation costs in the future'. His experience, however, was very demanding in terms of time and effort by volunteers, making it hard to replicate.

The resources that can be invested in technical advancements vary in each municipality and ICT expenses are seldom a priority in financially constrained organisations. In some cases, they may also depend on incumbent agreements with ICT service providers. Hence, precise estimations are complicated by a lack of comprehensive cost-benefit analysis coupled with the diversity of local experiences.

Time constraints can also be a problem. In K's agency, where substantial resources were invested in preparatory activities aimed at improving data awareness, several employees reportedly considered OGD-related tasks unnecessary or of low priority and were thus not able to comply with requests from the OGD department 'due to lack of time'. Sometimes, even when individuals showed interest in OGD-related activities, their managers would pressure them to focus on tasks they considered more important.

Technical resources should be addressed according to needs and availability of funds. Open-source software can be a less expensive or free option, does not imply the commitment to proprietary solutions and promotes interoperability in the long term. However, changing technological tools means changing routines, which will inevitably require an investment of human resources.

When financial resources are available, organisations can hire new employees or revise agreements with incumbent ICT service providers to gain technical expertise. The absorptive capacity of an organisation will affect how easily new technologies can be integrated with current routines. Employees at all levels need to master the activities necessary to open PSI, including data collection

13 € 300 000 for a department of 1.5 million people. Consultancy services included legal issues, technical solutions, data governance, database inventory, platform prototyping, and a communication plan – both internal to raise employees' awareness and external to engage the local community (mainly through social networks).

(for example, including contextual information as metadata), data processing (for example, respecting the requirements for open format tabular datasets) and data release on the platform (for example, licensing). On the other hand, public administrations are already endowed with domain experts: employees that, while 'data illiterate', understand the context where data is collected. Hence, while technical expertise is necessary to set up and maintain platforms, contextual knowledge is key to provide meta-information that will foster re-use. Workshops, regular cross-office meetings and promotional activities can help bridge between diverse set of skills.

Discussion

In this section, the focus is on three main reflections that emerged from the comparison of the interview data and from the literature within the framework of study: the importance of cultural factors in organisational restructuring; the need for further research about diverse issues in implementing OGD agendas; and a 'non-result', or in other words something that none of the participants mentioned: the perspectives of users.

Organisational restructuring through cultural change

There was a recurring theme in most of the interviews: implementing OGD agendas implies that consolidated organisational routines – those determining how individuals carry out their tasks, how they communicate and interact with each other, and how manager-level employees approach change – need to change. Relevant practices span across all the different phases of opening PSI and, in turn, impact each organisation's knowledge stocks and flows as well as feedback loops that promote or impede change (Helbig et al. 2012). According to the MLP, on the other hand, cultural obstacles are framed within landscape pressures, defined as artefacts that are deeply embedded in the fabric of society – such as prevailing political ideology, institutions, economic paradigms and socio-cultural values (Martin 2014).

Relevant examples were discussed with respect to data ownership issues (risk aversion), economic obstacles (moving away from sales-based revenues), interoperability (need for increased collaboration between old and new practices), and lack of resources (internal resistance due to public workers not understanding or not agreeing with the value of open data.). For example, both respondents and the literature mention lack of willingness or time to delve into OGD activities. According to some, this was due to low data literacy, lack of resources (both financial and human), or unwillingness to change habits. Hence changing routines may not be enough. Workers need to invest considerable effort in learning and assimilating new routines, and this requires a shift in their beliefs: they must consider OGD activities valuable.

In such cases, satisficing can help explain how people tend to protect 'business as usual' routines. With OGD activities dispersed along the public information value chain, employees may satisfy when collecting or processing data. For instance, they may not include full contextual information (i.e. metadata) because it seems tedious and unnecessary. Executives may also satisfice when, while being committed to share their organisation's knowledge, they press their employees to focus on other tasks.

The fact that OGD practices are still at the niche level also plays a role: as a respondent remarked 'it is hard to advocate for a radical change in routines when the public value that can be derived from OGD is yet to be proven'. Most participants also mentioned a broadly defined 'human factor' as a key to success throughout different parts of the interviews.

Based on the experiences collected, one can see how support from political leaders can help to legitimise new routines. Moreover, promotional and training activities (such as events and workshops) can help address doubts among employees and increase the absorptive capacity of those directly in charge of OGD collection and maintenance.

Despite cultural obstacles, four interviewees were convinced that OGD introduced significant changes to the routines of their organisation. Increased dialogue across offices was a prominent example, which led to improved internal efficiency and was positively valued by most employees. Two participants recounted how 'several months after our OGD project had started, employees from different offices (among whom there used to be no communication) were signalling mistakes about their data and sharing advice on how to solve them'.

Organisational knowledge management also appears to be affected by personal and power relations within and across departments. While routines are the building blocks of an organisation's knowledge, conflict and power dynamics are also cemented in its structure. Since OGD agendas can lead to data owners losing control over the information they produce and the revenues they can earn from data, new initiatives are likely to face strong resistance and conflicts at all levels: from relationships between employees in local administrations to political struggles across agencies.

Some PAs have taken a proactive approach to the issue by setting up a dedicated department or team that manages communication and coordinates activities.[14] OGD teams could map internal actors and their relations (both professional and personal); propose OGD supervisors within each department or office; work closely with external stakeholders to understand what datasets are in demand; and define organisational tools (for example, software, workshops, guidelines) for information opening activities. Moreover, these offices can help address doubts harboured by all stakeholders and promote cooperation among employees.

14 Examples include dedicated offices led by so-called 'open data evangelists' in the US and the 'chief data officers' in France.

Further research

Since OGD is still at a niche level and research on local contexts is still in development, some of the issues discussed during the interviews highlighted the need for additional experimentation. Few organisations, however, possess the resources (and perhaps political will) to risk venturing into 'uncharted waters', as one interviewee put it. Moreover, some issues cannot be decided at the local level.

As regards privacy issues, for example, case studies can to help clarify risks and benefits involved in opening different types of data. There is a need for analysis on the trade-offs between protecting one's information and the public interest.[15] Sensitive information could be provided to those who agree not to disclose it; lest governments lose opportunities for data-driven research.

Research is necessary to quantify the financial and human resources required to deploy OGD programmes as well as to release and maintain datasets. Moreover, there is a demand for clearer accounts of the economic and social impacts of OGD as fiscal constraints remain a major obstacle to OGD initiatives.

The Open Data 500 network, for example, investigates how SMEs in selected countries are using OGD in their businesses, and shows the aggregate impact on national economies.[16] However, case studies accounting for the efficiency gains derived from OGD-related routines (similar to the example on cadastral data discussed above) are still lacking.

Finally, sharing know-how will lead to improved guidelines for requesting data (both across agencies and from external actors) and changing internal routines. These can be adapted from previous works that are published under non-restrictive licenses. Examples include *Bordeaux Metropole*'s guide to citizen data requests;[17] the Open Government Implementation Model of the city of Vienna, which offers a tool to categorise data risk (Krabina et al. 2012); and *The Open Data Handbook* (Open Knowledge Foundation 2015).

Finally, the most recent Italian national guidelines provide both technical and legal guidance as well as laying out organisational tasks and responsibilities.[18] In the drafting of the latest edition, external stakeholders were consulted about how to improve the new guidelines, opening to a collaborative framing of the Italian OGD environment.

15 See McCann and Green's (2013) definition of public interest as 'not intended as public attention, but instead [as] interests like democratic accountability, justice and effective oversight'.

16 OpenData500 is a research project by the GovLab at NYU (http://www.opendata500.com). The Italian edition of the project can be found at: http://www.opendata500.com/it/. There is no similar initiative in France.

17 See http://www.bordeaux-metropole.fr/sites/default/files/guide-demande-open-data_0.pdf. Something equivalent could advise public workers about inter-agency data requests and ownership determination.

18 The latest 2016 edition can be found at: http://www.dati.gov.it/sites/default/files/LG2016_0.pdf.

The perspectives of users

Within my framing of the open data dynamics model, secondary users (namely external actors operating outside public institutions) were included as a force that can initiate positive feedback loops that promote change of routines but also support maintenance of OGD repositories through reciprocal governance. Indeed, throughout the interviews, a number of issues arose where involving users could help address (at least in part) some of the obstacles.

For example, interviews that discussed economic obstacles and/or release order issues, mentioned a difficulty in deciding whether all available PSI should be open at once (perhaps unrealistic in most of the cases examined) or that more valuable datasets should be prioritised. Choosing *a priori* which datasets are valuable, however, is not a simple task; collaborative data catalogues that integrate user-driven feedback could help PAs understand which datasets they should focus on in the early phases.

M's experience – where a group of volunteers started and maintained the local OGD initiative – shows how expertise can be harnessed to some degree from the local community. This is more likely to be a rare scenario rather than a replicable experience and user engagement cannot be predicted nor included in assessments of available resources.

Though the strong focus on the supply-side of this study coupled with semi-structured interviews may have limited the scope of the analysis, interviewees maintained a rather inward perspective on OGD-related issues. While one participant lamented how hard it can be to justify further investment on experimental ventures that do not show results in the short term, none considered cultivating the user community as a necessary step. Users could signal mistakes in the data, request more information and meta-information, thus cuing public workers about how to improve collection and processing activities. This may also give a sense that their efforts are being valued.

Limitations

The goal of this research was to provide concrete examples of the obstacles encountered by PAs that engaged in OGD programmes, at either municipal or provincial level. By using a strongly qualitative approach, it aimed to integrate a theoretical framework with a more pragmatic perspective. There are, however, important shortcomings that should be accounted for.

A first limitation is the relatively small set of respondents and the unbalanced division of participants between the two countries under study, with 11 Italian interviewees and only 4 from France. The majority of Italian examples meant that interesting anecdotes could not be compared with the French socio-political context. For example, in the section discussing economic obstacles, it is highlighted how several valuable datasets (for example, cadastral, location,

weather forecasts) are still largely unavailable as open data in Italy. Since this does not apply to their context, French respondents did not mention related issues. Understanding what resistances OGD advocates north of the Alps may have faced in releasing similar data, could nuance an understanding of the factors that impede data opening.

The choice of using semi-structured interviews may have also limited the number of issues discussed. While fluid conversations prevented researcher bias from influencing respondents, these might have focused on the problems that seemed most relevant at the time of the interview. Moreover, by examining only the supply side of OGD provision none of the interviewees discussed issues related to lack of user engagement.

Moreover, interviews lasted between one and two hours. Comparable literature did not specify the duration of their engagement with participants – in this research project one session per participant was conducted. While all interviewees were asked to confirm the statements included in the text one month after the interview, some issues may have been solved and new ones may have arisen since the end of the research period (i.e. June 2015).[19]

Finally, a few considerations on the theoretical framework. The combination of interdisciplinary theories helped to develop an understanding of the different experiences gleaned from the interviews within a common frame of analysis. A number of conceptual tools were chosen in an attempt to provide a more nuanced understanding of the OGD ecosystem. Routines and satisficing illustrate the decision-making processes of organisations and individuals respectively, while the open data dynamics model represents how knowledge stocks and information flows are influenced by wide range of activities and pressures. Finally, the multi-level perspective framed the diffusion of open data within its socio-technical context.

The open data dynamics model and the MLP were useful to explain the internal and external factors that affect knowledge management within PAs. Organisational knowledge management is, however, also affected by personal and power relations within and across departments. In this respect, approaches like the one proposed by Van Schalkwyk et al. (2016) provide a more comprehensive description of the connections between internal and external pressures.

Further research and more data collection is needed to refine the structure of the framework. For example, there are broad concepts that require a more rigorous definition (for example, those related to the 'human factor'). A second round of more structured interviews would also allow for delving into aspects that were not discussed by many participants (for example, release order and real-time data), or by none at all (like the perspective of users).

19 For example, at the time of writing (September 2016), France has actually stopped releasing data about land ownership and location (http://index.okfn.org/place/france/).

Conclusions

The aim of this study was to collect anecdotal evidence about how local PAs in Italy and France have initiated OGD agendas, what difficulties they encountered and how they may have tackled them. During the interviews, the perspective was informed by a preliminary theoretical framework that explored the different dimensions involved in making PSI available online – namely individuals, organisations and the socio-political environment in which they operate – and by a comparison with other empirical studies that explored similar issues in different European countries.

This approach was used in the hope that anecdotes, when combined with a theoretical framework, could help nuance the current understanding of PAs complex dynamics. In accordance with the literature, significant legal and technical barriers to the release of PSI were found. Moreover, there is an important cultural dimension that affects the restructuring of knowledge management in public administrations. Despite knowledge's increasingly crucial role for economic and social development, sharing PSI implies loss of control and revenues and political and conflict dynamics are resisting this shift.

The study's qualitative approach led to the emergence of three key results: the importance of cultural factors in organisational change; the need for further research about implementation costs, economic and social impact, and privacy issues; and the lack of efforts devoted to understanding the perspective of users. The latter point proves that PAs can still draw from their local communities. By encouraging feedback, they can crowdsource contributions for data collection and maintenance. Private companies and entrepreneurs can help to lead the development of data-driven products and services while civil society and citizens can pool resources to create innovative solutions to public problems and promote government legitimacy through monitoring initiatives.

The results presented in this chapter, although far from being generalisable, offer cues for reflection on the pragmatic obstacles to OGD diffusion and implementation at the local level. This research confirms the need to understand OGD initiatives within an evolving ecosystem composed of stakeholders that, despite their seemingly different incentives, can benefit from increased cooperation and open knowledge. What emerges is the image of organisations that lack financial resources and technical know-how, and while more open knowledge management models could help, PAs tend to resist change because of cemented routines and risk aversion towards the exposure of their inner workings to the public.

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REFERENCES

Barry, E. & Bannister, F. (2014). Barriers to open data release: A view from the top. *Information Polity* 19(1,2): 129–152. DOI:10.3233/IP-140327

Becker, M.C. (2003). The concept of routines twenty years after Nelson and Winter (1982): A review of the literature. *DRUID Working Paper* No. 3-6. Copenhagen Business School, Department of Industrial Economics and Strategy/Aalborg University

Coriat, B. & Dosi, G. (1995). Learning how to govern and learning how to solve problems: On the co-evolution of competences, conflicts and organizational routines. *IIASA Working Paper WP-95-006*. Laxenburg: International Institute for Applied Systems Analysis

Davies, T. (2010). Open data, democracy and public sector reform. http://www.opendataimpacts.net/report/

Davies, T.G. & Bawa Z.A. (2012). The promises and perils of open government data (OGD). *Journal of Community Informatics* 8(2)

European Commission (2003). Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003L0098:EN:HTML

Gray, J. (2014). Towards a genealogy of open data. *SSRN*. https://ssrn.com/abstract=2605828 or http://dx.doi.org/10.2139/ssrn.2605828

Helbig, N.C., Cresswell, A.M., Burke, G.B. & Luna-Reyes, L. (2012). *The Dynamics of Opening Government Data*. Albany NY: Centre for Technology in Government. https://www.ctg.albany.edu/publications/reports/opendata/opendata.pdf

Hellberg, A.-S. & Hedström, K. (2015). The story of the sixth myth of open data and open government. *Transforming Government: People, Process and Policy* 9: 35-51. DOI:10.1108/TG-04-2014-0013

Janssen, M., Charalabidis, Y. & Zuiderwijk, A. (2012). Benefits, adoption barriers and myths of open data and open government. *Information Systems Management* 29: 258–268. DOI:10.1080/10580530.2012.716740

Krabina, B., Prorok, T. & Lutz, B. (2012). Open government implementation model. Vienna: Centre for Public Administration Research. http://www.kdz.eu/de/file/11433/download

Lee, G. & Kwak, Y.H. (2012). An open government maturity model for social media-based public engagement. *Government Information Quarterly* 29: 492-503. DOI:10.1016/j.giq.2012.06.001

Martin, C.J. (2014). Barriers to the open government data agenda: Taking a multi-level perspective. *Policy Internet* 6: 217–240. doi:10.1002/1944-2866.POI367

Martin, S., Foulonneau, M., Turki, S. & Ihadjadene, M. (2013). Risk analysis to overcome barriers to open data. *Journal of e-Government* 11(1): 348-359

Open Knowledge Foundation (2015). *Open Data Handbook.* http://opendatahandbook.org/

Simon, H.A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics* 69: 99-118

Van Schalkwyk, F., Willmers, M.A. & Schonwetter, T. (2016). Institutionalising open data in government. *SSRN*. DOI: 10.2139/ssrn.2925834

Wirtz, B.W., Piehler, R., Thomas, M.-J. & Daiser, P. (2016). Resistance of public personnel to open government: A cognitive theory view of implementation barriers towards open government data. *Public Management Review* 18: 1335-1364. DOI: 10.1080/14719037.2015.1103889

World Wide Web Foundation (2015). Open Data Barometer (2nd edn). http://www.opendatabarometer.org/

Zuiderwijk, A. & Janssen, M. (2014). Open data policies, their implementation and impact: A framework for comparison. *Government Information Quarterly* 31: 17-29. DOI: 10.1016/j.giq.2013.04.003