

Open Data and Sub-national Governments: Lessons from Developing Countries

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Open government data (OGD) as a concept is gaining currency globally due to the strong advocacy of global organizations as Open Government Partnership. In recent years, there has been increased commitment on the part of national governments to proactively disclose information. However, much of the discussion on OGD is at the national level, especially in developing countries where commitments of proactive disclosure is conditioned by the commitments of national governments as expressed through the OGP national action plans. In decentralized contexts, the local is where data is collected and stored, where there is strong feasibility that data will be published, and where data can generate the most impact when used. This synthesis paper refocuses the discussion of open government data in sub-national contexts by analysing nine country papers produced through the Open Data in Developing Countries research project. Using a common research framework that focuses on context, governance setting, and open data initiatives, the study found out that there is substantial effort on the part of sub-national governments to proactively disclose data, however, the design delimits citizen participation, and eventually, use. Also, context demands different roles for intermediaries and different types of initiatives to create an enabling environment for open data. Finally, data quality will remain a critical challenge for sub-national governments in developing countries and it will temper potential impact that open data will be able to generate.

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Introduction

Open government data (OGD) as a concept is gaining currency globally due to the strong advocacy of global organisations as the Open Government Partnership (OGP). In recent years, there has been increased commitment on the part of national governments to disclose information proactively. This trend is significant, especially for countries where right to information is not legislated and the only way by which citizens or their intermediaries are able to access public data is through proactive disclosure by government.

The argument in favour of OGD is that it has the potential to unleash economic, social and political benefits. One report claims that the economic benefits of open data will amount to USD one trillion in seven economic sectors (Manyika et al., 2013). There are also claims that OGD has the potential to improve public service delivery (Granickas, 2013) and allow more opportunities for civic engagement, bringing citizens closer to their governments (Kucera & Chlapek, 2014). There is also a strong normative argument that opening up government data and providing information to citizens in reusable formats will promote greater government accountability and transparency (O'Hara, 2012).

However, much of the discussion on OGD is at the national level, especially in developing countries where commitments of proactive disclosure is conditioned by the commitments of national governments as expressed through the OGP national action plans. Despite significant moves towards proactive disclosure at the national levels, one can observe that the debate on public accountability overall has been overshadowed by talk on data standards, software, digital architecture, and the access and availability of information (Yu & Robinson, 2012). The focus on open government data at the national levels also glosses over the differences in the political, social, economic and digital divides that exist at the sub-national levels. The approach to being an 'open government' seems to be similar across several countries, and where 'the preparation and launch of open data initiatives follows an orthodox approach involving hackathons, training events and outreach activities' (Davies, 2014b).

In general, little is understood regarding the context, supply of open data, technical platforms and standards, governance setting, intermediaries, and actions and impact of open data¹ in the context of sub-national governments – in provinces, cities, municipalities – of the developing world. In this context, the Exploring the Emerging Impacts of Open Data in Developing Countries (ODDC) project produced a significant amount of literature that can aid us in understanding how open data emerges, develops and matures in the context of sub-national governments in developing country contexts.

This paper is structured in four parts. The first part provides a brief introduction of the ODDC project from which we take the analysis of this paper. In this part, we also discuss the research framework used, the questions we wanted to answer and the methodology for arriving at a qualitative summary of the findings from the cases. The second part briefly reviews the literature used to frame our analysis, particularly in the context of decentralised governance. The third part summarises the findings of the study, with particular attention on context, governance setting and actions that hasten the emergence of OGD in sub-national

¹ For an elaboration of these analysis parameters, see Davies, Perini and Alonso (2013).

contexts. The fourth part presents the conclusion and offers suggested actions for future open data work and research.

Background and methodology

The ODDC project was a multi-year, multi-country project that looked into how open data is used and is generating impact in the developing world. More specifically, it ‘explores how open data can foster improved governance, support citizens' rights, and promote more inclusive development through looking at the emerging impacts of existing open data projects in developing countries’ (Davies et al., 2013).

The project, with the support of Canada’s International Development Research Center (IDRC), funded a total of 17 case studies in Africa, Asia and Latin America. At least nine of these case studies focused on sub-national governments in different thematic areas – sanitation in cities in Chennai, India; health service delivery and municipalities in the Philippines; urban slums and rural settlements in Kenya; open data and cities in Brazil, Argentina and Uruguay; open legislature in Brazil; and budget and fiscal transparency in Brazil and the Philippines. A summary of the cases included in this study are presented in Table 1 below.²

Table 1: List of cases reviewed

Country	Title of study	Author(s)	Sector/theme	Sub-national area
India	The Quality of Civic Data in India and the Implications for the Push on Open Data	Shekhar, S. & Padmanabhan, V.	Health	Chennai(city)
Uruguay	Opening Cities: Open Data in Montevideo	Scrolini, F.	Urban development/cities	Montevideo (city)
Brazil	Open Government Data in Rio de Janeiro City	Matheus, R. & Ribeiro, M.	Urban development/cities	Rio de Janeiro (city)
Kenya	Open Government Data for Effective Public Participation	Chiliswa, Z.	Poverty and slums	Nairobi (city)
Philippines	Exploring the Role of Open Government Data and New Technologies: The Case of the Philippines	Ona, S., Ulit, S., Ching, M., Hecita, I., Padilla, T. & Angeles, S.	Health and economic development	Bacolod, Bago, Iligan, Iloilo (cities)
Brazil	Open Data in the Legislative: The Case of Sao Paulo City Council	Matheus, R. & Ribeiro, M.	City governance – legislation	Sao Paulo (city)
Argentina	Opening Cities: Open Data in Buenos Aires	Fumega, S.	Urban development/Cities	Buenos Aires (city)
Philippines	Opening the Gates: Will Open Data Initiatives Make Local Governments in the Philippines More Transparent?	Canares, M., De Guia, J., Arawiran, J. & Narca, M.	Fiscal transparency	Bulacan, Bohol, South Cotabato (provinces)

² The respective research reports can be found at <http://www.opendataresearch.org/reports>

Brazil	Measuring Open Data's Impact of Brazilian National and Sub-national Budget Transparency Websites and its impact on People's rights	Beghin, N. & Zigoni, C.	Fiscal transparency	Sao Paulo (city)
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The questions posed by this synthesis paper, drawing from these case studies, are the following:

- a) What context, governance setting and actions hasten the emergence of open government data in developing countries?
- b) What facilitates or hinders the supply and use of government data in sub-national contexts in developing countries?
- c) What lessons can be learned from the cases in terms of creating and sustaining the supply and use of open government data at the sub-national level in developing countries?

To answer these questions, more particularly questions (a) and (b), a re-reading of the nine cases was done in order to develop a comprehensive and complete list of responses to the questions. The list was coded and themes were generated from these coded responses. The answers to these questions were analysed in order to come up with key themes that respond to the third question regarding lessons that can be learned to ensure better supply and use of open government data at the sub-national level in developing countries. A workshop was held at the Open Data Lab in Jakarta in February 2015 to write the preliminary draft of the synthesised research findings and results. The framework used to analyse the case studies is presented in Figure 1 below.

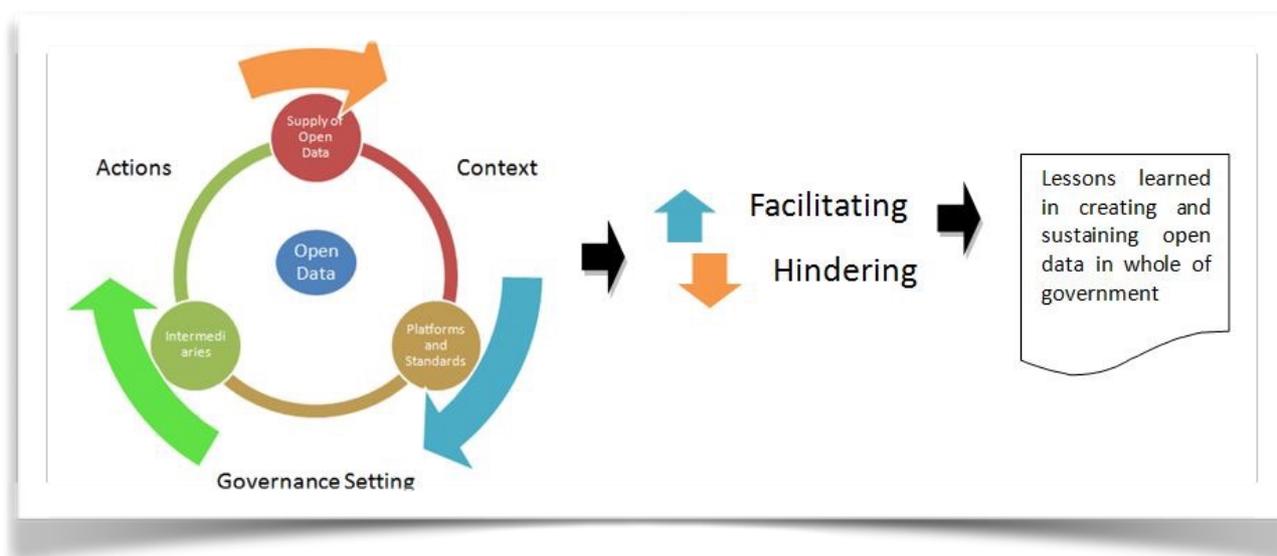


Figure 1: Research Framework

Figure 1 above is adapted from the research framework of ODDC where:

- a) The context for open data – includes the political, organisational, legal, technical, social and economic context of the locality.
- b) The supply of open data – including data availability, legal frameworks for data, data licenses, and the stakeholders involved in providing data.
- c) Technical platforms and standards – including data formats and data standards used, and any data catalogues, APIs or analysis tools provided by an open data initiative
- d) The context of the specific governance setting – including a description and history of the issues in focus, details of key stakeholders, and analysis of how data plays a potential role in this setting.
- e) Intermediaries and data flow – documenting the means by which data is made accessible in the governance setting: how, and by whom?
- f) Actions and impacts – documenting the experience of those seeking to use data, and providing evidence of intended or unintended consequences.

Each of these areas were looked into in the cases reviewed, and the facilitating and hindering factors were identified in each of the components above (a to f), whenever possible and as the data of the cases would allow. As the synthesis is based largely on the research papers mentioned, the analysis of results is limited to what were provided in these documents. There was no opportunity to ask for more information from case authors, except for the cases from the Philippines and India whose authors also wrote the synthesis. Finally, the answers provided by each of the case studies for each of the elements mentioned in (a) to (f) above were coded, clustered, and titled in order to arrive at common themes that characterise the state of open data in sub-national governments. These form the basis of the findings and conclusion of this paper.

Why the local?

Decentralisation, as an integral component of the good governance discourse, has been implemented in developing countries, pushed by different forces and actors in the last 20 years. For some, decentralisation is a consequent effect of democratisation, recognising that representative governance can only work in contexts when local participation is assured (Stoker, 1996). For others, decentralisation is driven by the globalisation phenomenon as more national governments acknowledge the limitations of centralised planning and management in dealing with more globalised challenges confronting nation states (Shah and Thompson, 2004).

In the context of developing countries, it is argued that decentralisation, as part of the democratization process, is largely influenced by international agenda, especially because of ideological shifts in the more developed economies and the international organisations working in governance reform (Mkandawire, 2006). The World Bank, for example, spent a total of USD22 billion between 1990 and 2007 in 20 countries for decentralisation reforms (World Bank, 2011). However, the changing political dynamics and the challenges associated with it, also pushed developing country governments to implement waves of decentralisation reforms (Faguet, 2011).

Decentralisation, therefore, is something we have to contend with in any context of governance program or intervention, open government data included. It is important to define decentralisation in this case. This paper takes Ojendal and Dellnas' (2013) definition that decentralisation 'generally refers to the transfer of powers and resources from the central government to lower levels in the state hierarchy' (p.10). It can be a form of devolution (political or democratic decentralisation), delegation or deconcentration (administrative decentralisation) or fiscal decentralisation. To date, almost all countries, regardless of system of government, have some form of decentralisation in place, whether political, administrative or fiscal.

OGD falls under the gambit of open government that has transparency, participation and accountability at its core (TAI, 2014). It requires that the public understands how their government is working, that the public has a say in governance and that the public can call their leaders to account for their performance. In decentralised government structures, this characterisation extends to the local level, where most governance activities take place, where the relationship between the government and the governed is proximate, and where demand for public services exact accountability of elected leaders.

Focusing on the local level has strong substantial evidence. Those that have studied decentralisation extensively in the last 20 years suggest that decentralisation makes government more responsive to the needs of local citizens (Alderman, 2002; Faguet 2004), promote inclusiveness in development (Helmsing, 2004), and thus eventually leads to increased citizen satisfaction with regard to government's delivery of public services (Diaz-Serrano & Rodriguez-Pose, 2012). As such, focusing on the local level in terms of ensuring openness in governance will make the impact of open government data more real to citizens as programmes become more responsive to local needs, increase citizen participation, and thus improve citizen satisfaction with governmental services.

These results, however, are not automatic and a strong argument that decentralisation does not result to these perceived effects has been put forward by Grindle (2007) who highlights the tension between decentralization as a theoretical and a practical construct. Grindle argues that among the different hypotheses regarding how decentralisation can work, electoral competition and political entrepreneurship have the greatest effects on the quality of decentralised governance. Arguably, it is not decentralisation per se that brings about the positive effects to the quality of governance but a myriad of factors including the complex interactions among political institutions, societal demands and political stakeholders as politicians and citizens.

Like any governance reform programme, the complexity of the interrelationships between actors and their interests needs to be considered. Inarguably, development and change is not a result of one factor. In the case of open data, for example, publication of OGD will also not necessarily lead to outright improvement in people's lives (Davies, 2014b). Davies argues that for open data to lead to outputs, outcomes and impact, there are many factors to consider – how open data is used, how people are able to access technology, how committed leaders are, how much resources are put into open data initiatives, how active civil society and other intermediaries are in governance, among others.

A more recent review of decentralisation reforms summarises the major arguments on how and why decentralisation can work. Manor (2013) argues that decentralisation can work only when there are substantial powers at the local level, matched with sufficient resources, and kept in check by institutionalised accountability mechanisms. This echoes Agrawal and Ribot's (1999) argument that efficient decentralisation happens when representation and downward accountability is strong matched with countervailing powers to hold local powers accountable.

We take these views in framing the analysis of the different cases in this study. Indeed, the local level is important in the context of open data. In decentralised contexts, it is where data is collected, where data is stored, where there is strong likelihood that data will be published, and when used, it is where data can generate the most impact. However, the context of open data is also important. Questions on whether there is a strong regulatory environment for openness, whether there is a sustained demand and interest in government data, whether there are resources retrieved from the sub-national level to harness the potential of open data are critical.

We therefore wanted to look at the overall context which influences local power, local resources and accountability mechanisms that affect how open data can be initiated at the sub-national level. We consider these three elements on both the demand and supply side of open data. For example, intermediaries can be positioned as part of local accountability mechanisms. Technical platforms and standards as well as local legislation may define local power, while the condition of technology is part of local resources. However, to streamline the presentation of findings, we present the results using three major headings – factors that need to be in place to *initiate* open data practice, facilitating/hindering factors in open data *provision* and facilitating/hindering factors in open data *use* – keeping in mind that success at the local level can only happen when two factors exist: ‘a bottom-up demand from citizens for accountable government closer to the people’ and ‘top-down agenda aimed at improved governance at the local level’ (Ojendal & Dellnas, 2013, p.7).

Research findings

What needs to be in place to initiate open data practice?

Across cases, the primary driver of openness at the sub-national level is the presence of national or local legal framework promoting the same. The legislation sets the stage for civil servants at the local level to comply with the required standard of openness and paves the way for institutional sustainability. These laws can be about freedom of information (FOI), proactive disclosure or open data. Each of the countries covered by these studies has different legal frameworks for openness (see Figure 2).

There are countries with legislated Freedom of Information (FOI) laws backed by policies that ensure proactive disclosure. For example, transparency law in Brazil, promulgated in 2009, requires all public entities to publish on the web detailed budget data in real time. The same law requires that by 2013, more than 5500 Brazilian municipalities must publish financial and budget data on its portal. Brazil also promulgated the Information Access Law in 2012, which is roughly equivalent to a FOI act. India passed a right to information (RTI) law in 2005. In terms of open data, the country implemented in 2012 the National Data

Sharing and Accessibility Policy (NDSAP) which was intended to promote data sharing and enable access to government data. NDSAP requires that government publish government data in re-usable formats but targets central government specifically. There is no similar policy directing state-level governments to do the same.

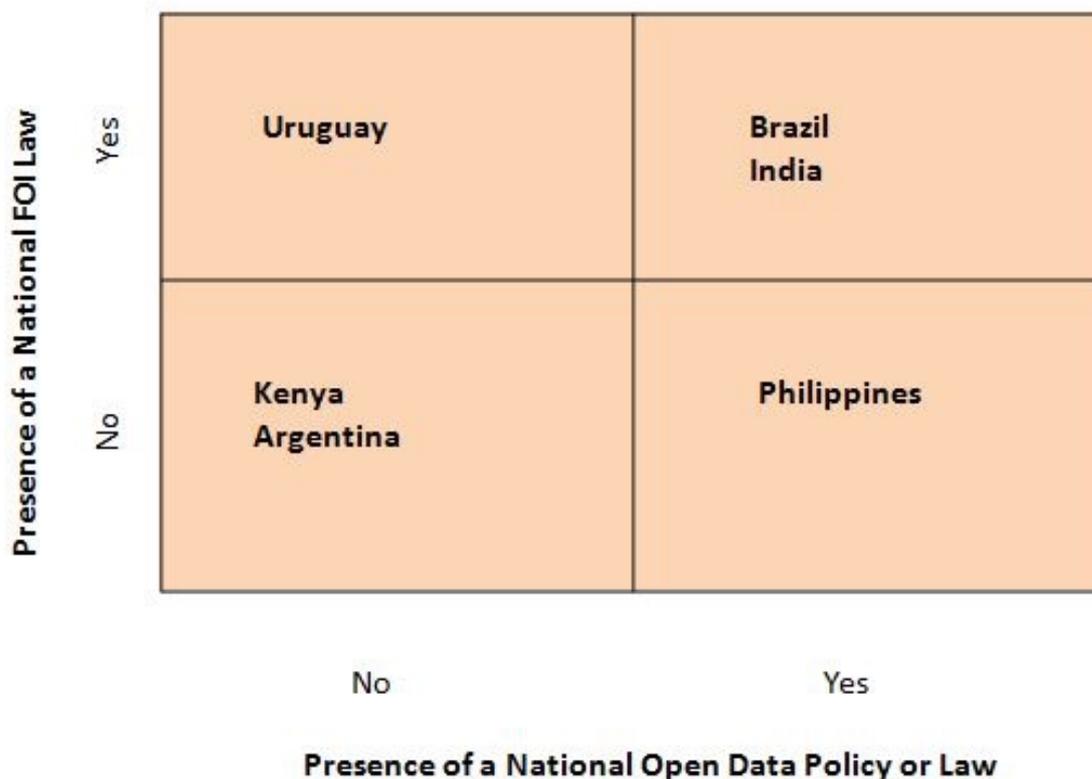


Figure 2: Countries and Legal Frameworks for Openness

There are countries where the main basis for information disclosure is an FOI law, without any policy that promotes open data. For example, Uruguay passed a FOI law in 2008. Despite deficiencies (e.g. the lack of a definition for what constitutes public bodies) it is considered an achievement in the country’s efforts to cultivate transparency. Recently, Uruguay also passed the Free Software and Open Standards in the Public Sector. Though not necessarily an open data policy, it sets the stage for government preference of non-proprietary file formats. The city of Montevideo is purportedly the first city in Latin America with an open data policy.

There are countries without any FOI law but with policies or regulations that require proactive disclosure. In this category belongs the Philippines, which does not have a FOI law but has the Full Disclosure Policy (FDP) issued by the Department of Interior and Local Government. The FDP requires local government units to disclose proactively certain types of data on their websites or on the FDP portal, a dedicated portal where local government units (LGUs) can upload and citizens can access finance-related information. Despite the insufficiency in the number and type of data required to be disclosed publicly, this is considered a significant step in transparency, especially in a context where there is no FOI

law. The provinces and cities studied in the two cases reviewed for this synthesis are compliant with this policy.

Finally there are two countries without any FOI law and no national policy on open data or proactive disclosure: Kenya and Argentina. While Kenya enshrined in its constitution the right of citizens to information, the country does have its own FOI law. It also does not have an open data policy that governs the country's open data initiatives but has invested heavily in an open data programme called the Kenya Open Data Initiative. In the same way, Argentina does not have an FOI law or any policy related to proactive disclosure.

Given these contexts, one can ask, why do provinces, cities and municipalities covered in this study, despite absence of legal framework, proceed with implementing open data initiatives? The question largely applies to the cases of Kenya, Argentina and India. In Kenya, it was the effort of the ICT ministry that launched open data initiatives despite the lack of a solid legal basis. But in Argentina, the case was very different – while the federal state does not have an FOI, the city of Buenos Aires passed its own FOI law. In India, because the NDSAP does not focus on sub-national levels of governance, a civil society organisation pressed the Chennai city government to ensure information provision by working with government and building its own portal. The same happened in Bahia Blanca, in Argentina, but it was government who initially developed a portal that was taken forward by a programmer by making the data from the portal more understandable by citizens (Chao, 2013).

A major insight that emerges from these cases is that while a national legal framework is critical, the absence of such is not a major hindrance in making data open to the public at the sub-national level, as the cases of Chennai in India or Buenos Aires in Argentina suggest. But national laws and regulations are critical, especially in cases when other frameworks like the FOI are absent. Proactive disclosure in the Philippines only happened due to a policy that carries both rewards (e.g. the grant of the Seal of Good Housekeeping for compliant local government units) and sanctions (e.g. public officials who do not follow are administratively liable), because FOI is still under debate among legislators.

What facilitating and hindering factors exist in open data provision?

Across the cases, we found six factors, namely, political leadership, implementation structure, availability of governance data, technical capacity of suppliers, presence of intermediaries, and implementation of concrete open data initiatives that facilitate or hinder open data provision. A positive condition of each factor is considered a facilitating factor while a negative condition is considered a barrier to the provision of open data in sub-national contexts. These factors are discussed in more detail below.

Political leadership

As with any governance intervention, political leadership is critical in data provision. In Buenos Aires, the chief executive serving his second term in office enacted a decree on open government that focused on proactive disclosure of data in reusable formats. In the provinces of Bohol and South Cotabato in the Philippines, the success of transparency efforts owed much to the fact that governors of both provinces ran on a platform of transparency and committed their efforts towards this.

However, the Chennai case in India provides an antithesis regarding the high degree of importance of political leadership. With NSDAP focusing on national government apparatus and no law requiring sub-national governments to undertake proactive disclosure, a civil society organisation compelled the city government to improve data collection and does the function of community profiling on its own. In which case, when government does not perform its role, civil society can hold it to account. This resonates with the experience of Nepal (not part of this synthesis) where the country's open data portal is not maintained by government but by a consortium of non-governmental organisations. However, it is important to highlight that the state of civil society and its extent of participation in local governance is a determining factor in their ability to take on the role that governments failed to play.

Implementation structure

Even with the existence of a law or a policy, without the existence of a functioning implementation structure, no concrete results are likely to be seen. In Montevideo, an Open Data Working Group was organised to undertake open data initiatives. In the case of Sao Paulo, implementation was spearheaded by the Sao Paulo City Council, the Department of Information Technology and the Department of Communication. In Buenos Aires, the Office of Information and Open Government and the Ministry of Modernisation spearheaded the implementation of open data projects. In the Philippine cases, the information and technology departments of the provincial governments ensured the uploading of required documents on the FDP portal and the provincial websites.

Some local governments make use of decentralised implementation structures in the proactive release of governance data. In Buenos Aires, each agency in the city government is responsible for maintaining the data and authorising its release. The Office of Information and Open Government will seek the authorisation of city agencies before publishing data on the portal.

Across all cases, we found that implementation mechanisms and the corresponding allocation of human and financial resources are necessary to ensure that laws on open data and action plans are implemented.

Availability of governance data

Sub-national governments that have certain degree of automation in their data management systems (e.g. data is systematically collected and held in digital formats) have greater potential to disclose data; and more so in sub-national governments that use highly sophisticated systems in managing data. In Rio de Janeiro, at the time of the study, there were 1200 datasets and 30 files in 13 categories. These data were habitually held in digital formats by the agencies dealing with education, environment, enterprise, social development, sports, taxes, tourism, among others. In the Philippines, compliance by local government units with the FDP was at more than 80% when it was first implemented – made possible by the fact that data required to be disclosed under the policy came from financial systems with clear data collection, aggregation and reporting procedures. Thus, disclosure is easier because no additional effort of digitisation is required.

In several of the cases, provision of open data to the public usually commenced with data that was readily available—and particularly data collected and held in digital and in open formats.

This approach was seen as the best option to jumpstart open data provision. For example, the FDP in the Philippines required local government units to disclose data that they habitually prepare as spreadsheet files – budgets, procurement plans and utilisation reports. Publishing these datasets does not require significant effort on the part of civil servants, except uploading them to websites as CSV files. In Montevideo, the city government decided to disclose data progressively on its portal, starting off with geographical and transport data. The government decided to use these datasets because these were the ones that were already collected and held in open format, and the policy could therefore be put into motion in a shorter span of time.

Technical capacity of suppliers

The availability of governance data that is ready for proactive disclosure is invariably linked to the technical capacity of sub-national governments. High technical capacity makes data provision easier. In Montevideo, the IT department of the city government has high capacity, including software development. This is the result of a long tradition of systems development, especially in the human resource sector.

In Rio de Janeiro, technical capacity is high in both skills and IT infrastructure – they have sensors on street lights, GPS on buses and a data centre with skilled people set up by IBM. This facilitated the provision of real-time transport data. However, in Chennai, this is not the case. The case study points to the almost non-existent technical capacity at the level of the bureaucracy – even manual data systems are plagued with data quality and timeliness issues. For example, when Transparent Chennai worked with the government to geo-locate public toilets, they discovered that the data is not compiled, in most cases outdated, and when available, these are not in open formats.

This point to the fact that when technical skills are deficient within government, especially in collecting, aggregating, storing, curating and publishing data, open data as a governance agenda is likely to be difficult. Across all cases, we found out that if skills and technical capacity, including infrastructure, are high, the likelihood that the open data initiative will be implemented and sustained is increased.

Presence of intermediaries

However, government does not necessarily have to possess high technical capacity in open data. The Chennai city government, because of evident weakness in improving data quality, was aided by Transparent Chennai, a local NGO, who worked with the government in raising the quality of health and sanitation data from within. Transparent Chennai was used to making right-to-information requests to get government data that nevertheless had quality issues. At the time of writing, the organisation had a memorandum of understanding with the city government to improve data quality and to help solve real-world problems, like in the provision of public toilets.

Intermediaries can also be from the business sector. When the Rio de Janeiro city government decided to use data to better manage natural disasters as flooding, after the heavy rains in 2010, it partnered with IBM to establish the Centre of Operations for Rio de Janeiro, where secretariats of different city agencies collect, aggregate and analyse geo-referenced data on several aspects in the city from river levels to transport. However, intermediaries from the

private sector can also act on their own even without the prodding of government. An independent data programmer in Buenos Aires created a public expenditure portal, enhancing open data provision.

Intermediaries also exist within governments. In the case of Argentina, intermediaries, referred to in the paper as policy entrepreneurs, led to the introduction of open data into the local and national policy sphere. In the Philippines, an internal audit office in a province made sure that the local government complied with the FDP by checking regularly the documents disclosed on the government website and reminding document owners about their responsibilities. This system was created to ensure that the local government does not miss out on incentives (e.g. awards for good local governance) and that it maintains its reputation as one of the best governed provinces in the country. The role of these intermediaries is critical in open data provision. However, more research is needed to ascertain their motivations.

Implementation of concrete initiatives

The true test of the functionality of open government data in sub-national contexts is the implementation of concrete open data initiatives. These initiatives can be classified into two categories – those that relate to open data provision, and those that relate to the promotion of open data use.

Most of the sub-national governments covered by this paper, except for Chennai, make use of portals to supply data publicly and proactively. The Latin American cities of Montevideo, Rio de Janeiro and Buenos Aires each have their own open data portal. Kenya has a national data portal developed through the Kenya Open Data Initiative, but this portal also contains local data. The provinces covered in the Philippine case each have their own website where they also proactively disclose data apart from the FDP portal.

Several of the cases use hackathons as a way to increase data uptake. Sao Paulo, Rio de Janeiro, Buenos Aires and Montevideo held hackathons based on sub-national data while in the Philippines, Kenya and India, hackathons were held based on national data. There were other creative citizen engagement strategies employed in some cases. In Buenos Aires, the city established the Government Laboratory which is a physical space where various stakeholders discuss public-interest problems and work collaboratively to achieve solutions. All these initiatives by local governments hasten open data use by making citizens more aware of the data and by improving understanding of the data.

What facilitates or hinders open data use?

The case studies showed at least five critical factors that hasten or prevent open data use. These are (1) existence of real-life problems or challenges to be solved, (2) the quality of the data, (3) technical capacity on the part of users, (4) the existence of intermediaries, and (5) the incentive and interest to participate. As in the previous section, the presence of these factors facilitates open data use, while the absence of any of these factors is a barrier. These factors are discussed below.

Existence of real problem to address

The cases suggest that the initiatives where there is evidence of use are those where the open data were used to address real problems faced by citizens. For example, in Rio de Janeiro, applications related to transport (e.g. Easy Taxi) and also one related to public toilets, especially during Carnival, showed high data uptake. This indicates that data use occurs when data provided relates to an actual issue or problem identified or articulated by citizens or governments.

In the case of the Philippines, where the majority of the data relate to public financial management, it is the business community that has the greatest uptake especially because procurement data is used to anticipate government procurement activities. This also reaffirms the finding that open data does not only serve social purposes but also economic ends.

If data, regardless of whether it is open or not, serve political, economic or social ends, it will always be sought by people who need the data. Without any apparent need of a dataset, despite the volumes released, data use will not be a natural consequence of disclosure.

Data quality

For data to be used, data should be credible in terms of quality, and users should trust the usefulness of the data. In the case of Chennai, because quality issues abound in the city government's health and sanitation data, Transparent Chennai decided to improve the quality of data from within rather than to use the data. Together with the city government, it improved data on public toilets so that government could proactively respond to the challenges.

In Sao Paulo, while initially the budget data provided was useful, the lack of disaggregation and detail in the data dampened people's interest in the data. *Ciudando do meu Bairro*³, a tool to monitor implementation of the city budget, was not fully implemented because the budget data is not geo-coded. While textual analysis of budget data was attempted, full analysis could not be done because the budget data are described in a generic way and presented in an aggregated manner.

Technical capacity of users

Without the capacity of users to access and make use of data, even when data provided is of sufficient quality and quantity, there is no data impact. In a context where internet penetration is low, citizens may prefer modes of accessing government data other than portals. In the Kenyan case, 77% of respondents prefer to access information through the radio and less from government portals. In rural settlements in Kenya, besides radio and TV, citizens also prefer accessing information from traditional modes as churches or mosques, and also from community centres.

It is therefore naive to say that opening data and disclosing data on portals will lead to use. The primary question is whether users have capacity to access data. Capacity can refer to technical skills (explicit knowledge and methodologies), organisational capacity to function

³ <http://cuidando.org.br/>

(in the case of organisations) and enabling conditions such as laws, systems and strategies (Pearson, 2011). In some contexts, one of the greatest barriers to data use is lack of technical capacity.

Capacity will be different at the organisational and individual levels. In some contexts, like in the Kenya and Philippine cases, capacity of individual users is significantly lower than the capacity of the organisations because often organisations have more resources. In Kenya, most citizens do not access government data and information from portals, but from intermediaries such as local churches. Local churches have more capacity to access and understand publicly-disclosed government information. In the Philippines, organised groups, and not necessarily ordinary citizens, know that the government discloses information through its website and portals.

However, the capacity of organisations is also differentiated; some organisations have more resources to access data compared with others in such a way that they are able to benefit from the data. In the Philippine case, for example, business organisations with regular access to the internet and who employ staff who regularly monitor government's public disclosure of data were the ones who benefitted more. These businesses used government budget and planning documents to anticipate procurement opportunities that they could participate in within a local government's calendar year.

Existence of intermediaries

Given a context of a lack of capacity, intermediaries which hasten open data use are important. An open data intermediary 'is an agent positioned at some point in a data supply chain that incorporates an open dataset, is positioned between two agents in the supply chain, and facilitates the use of data that may otherwise not have been the case.' (Van Schalkwyk, et al., 2016). The definition positions the intermediary in terms of reuse rather than solely in relation to its connection to data providers.

The cases covered by this synthesis point to at least three conditions to consider when it comes to intermediaries. First, intermediaries are critical to ensure data use, especially in contexts like the Philippines where awareness regarding the existence of the data is low, or when the capacity of users to make use of and derive results from data is limited. Second, the role of intermediaries is largely dependent on context. In Rio and Sao Paulo, the World Wide Web Consortium and Open Knowledge Foundation acted as hackathon sponsors. In Montevideo and Buenos Aires, civil society organisations, the private sector and journalists played significant roles in developing applications, in increasing socialisation processes for open data, and in advocating for more transparency. In Chennai, Transparent Chennai simplified data and conducted training for data suppliers and users alike. Third, data intermediary organizations need not be open data intermediaries. This is the case in Kenya where local chiefs, community centres, churches and mosques, function as intermediaries between governments and citizens.

Opportunities and incentives to participate

It is important that for citizens (or citizen groups) to use OGD, they should be able to discover the value of using the data to influence governance (opportunity) or to improve their lives (incentive). Without the opportunity to influence and/or realize the benefit that would

result from participation, sustained use of data by citizens (or citizen groups), is not likely to occur. For example, if citizens find that through engaging with government budget data, they can actually influence how social funds are being allocated and spent, and benefit as a result of the process, they will most likely sustain their level of participation in governance.

In the urban slums of the Kenyan case study, data on the number of bursaries awarded by government to students is the most sought after information. This information is important for parents to know how many bursaries are available and how likely it is that their children will be successful in obtaining a bursary. This, however, relates more to the incentive than to the opportunity, as local citizens do not see their ability to influence how bursaries are allocated or awarded. In Brazil, an organisation called Centro Feminista de Estudos e Assesoria (CFEMEA) continuously undertakes budget analysis of the federal government to influence gender budgeting. This sustained process of engagement led to parliamentary amendments to the public budget, perceived to benefit more women in the process. While CFEMEA operates at the federal level, it highlights how the opportunity to influence linked to a perceived benefit can lead to sustained use of open government data.

This affirms the findings of scholars in participatory governance who argue that citizens who feel that they have control over the resources of government have the higher incentive to participate in governance (McGee, 2003).

Conclusion: What can we learn from these cases?

The cases covered in this review showed how open government data can potentially unlock economic, social and political benefits. City and provincial governments have improved planning of transportation, electricity and other services. They have also enabled businesses to use government data to innovate on solutions to these governance problems. The case studies considered in this paper also demonstrate how national and sub-national governments have adopted similar approaches to open government data - one that rely on websites and portals to publish government data. However, upon closer examination one finds that the contexts of these developments differ vastly, as the discussions above demonstrate, as do the capacities of the governments and intermediaries involved. The cases highlighted three insights in this regard.

1. *There is substantial effort on the part of sub-national governments to proactively disclose data, however, how this is implemented delimits citizen participation, and eventually, use.* The legal context for each of these case studies is one where there is a legislation mandating access to information, either proactively or reactively. We see that the sub-national governments have released open datasets which can improve government efficiency and have potential social and economic benefits, such as data on bus routes and health services. However, we have also seen in several cases the limited use of these data sets by people who have the power to hold governments more accountable.

The efforts to release open data on gender and development in the Philippines and on budgets in Sao Paulo aim to inform citizens about their governments but the ability of citizens to participate in decision-making as to how these funds should be allocated and used seems to be limited. In the Philippines, while gender budgets are available online,

this information was not widely disseminated thus women groups were not even aware that the budget information exists. In Sao Paulo, while budget data is publicly available, this does not contain the level of detail that people needed so that they will be able to influence budgeting and spending of government funds.

The choice of what data to make available is typically made by the government rather than by the people. There are limited examples where data and APIs were disclosed and provided by governments based on demands made by users – such as the hackathon in Buenos Aires and the public workshop in Montevideo. In almost all the cases, technology has been used to make government data available. However, these governments have not used technology to bridge the gap between governments and citizens, nor to establish feedback loops that would be durable or could connect with hard-to-reach communities.

The intention and willingness of governments to engage citizens through data and to make governance more inclusive and participatory is largely dependent on political leadership. The cases covered by this synthesis suggest that when political leaders are committed to disclosure and transparency, with or without the prodding of other actors within and outside government, open data initiatives can happen, attract the necessary resources and generate results. This goes back to Grindle's (2007) argument that politicians acting within this new context have the ability and the power to shape governance patterns, processes, systems, and eventually outcomes. If political leaders will design open data initiatives in such a way that it is more demand-driven and relevant to citizen's needs, initiatives can potentially result to improved citizen participation in governance.

2. *Governance context demands different roles for stakeholders and different types of initiatives to create an enabling environment for open data at the local level.* Political, organisational, legal, economic, technical and social contexts will either support or undermine open data initiatives, especially at the level of decentralised governance. For example, national laws and pronouncements directing sub-national governments to disclose data are important, but without the technical capacity of government personnel to make this happen, this will not likely result to compliance. In the Philippine cases, the local governments studied were regarded as the best governed provinces in the country, thus the presence of implementation structures and responsibilities to ensure compliance. However, in contexts where there is no law at the national level, capable governments with the vision and intention can make the open data a priority agenda, like in the city of Sao Paulo in Brazil.

Before open data use can occur, open data provision has to take place. As indicated earlier, leadership is crucial, but this has to be complemented with available resources – technical, human and financial – because open data initiatives are not inexpensive. Sub-national governments with resources will find it easier to make proactive disclosure happen and generate results, but admittedly, this is not the case in all local governments in developing countries. The status of decentralised open data in developing countries brings back Manor's (2013) argument regarding the promise of decentralisation: It can only work if at the sub-national level of government, there are substantial powers matched with sufficient resources.

Manor (2013) also highlights one critical dimension for decentralised governance to work – institutionalised accountability mechanisms. While this can include structures within government such as audit institutions and anti-graft courts, civil society organisations can also hold government in check. While Manor (2013) is sceptical about the importance of civil society, he acknowledges that in some contexts it contributes to the deepening of democracy in decentralised systems. Civil society organisations can intermediate democratic change, as Cheema (2013) argues – bridging citizens and governments in a process of negotiation and contestation.

In this case, context also determines the kind of roles that intermediaries will play. In the Latin American cases, it is observed that the intermediaries in the supply and demand for open government data have largely been technical experts, academia and journalists, and their engagements have been directly with sub-national governments. Reports and manuals that were prepared to explain how to access and use the data portals were done keeping hackers and the technical development community in mind.

In contrast, the intermediaries in the African and Asian cases have been civil society organisations that work on frontline public service delivery and with communities. In the case of Kenya, India and the Philippines, we see that the intermediaries expended their own resources to access data from government – either from online sources or hardcopies from government officers – and transformed those data into formats that are useful for advocacy efforts within the communities with which they worked. This reflects the low levels of access and literacy of the communities that the intermediaries work with, but highlights the need for OGD initiatives to be designed for such social and economic contexts.

3. *The capacity of government and its attitude towards proactive data disclosure is one of the critical challenges for sub-national governments in developing countries.* These cases signal that opening government data or open government initiatives do not necessarily or automatically translate into improved service delivery or enhanced transparency and accountability. While there are several ways in which open (government) data can ‘enhance democracy’ – among others, to control corporate lobbyists, fight corruption and hold politicians to account – these are premised on the availability of complete, accurate, updated and open data. However, the overarching concern in most developing countries is the extreme poverty of data. Yet, those that have the potential to improve equity of access to basic services, such as water, sanitation and health, remain inaccessible in open formats. In several of the cases, the ‘easy-to-disclose’ data are the ones that are being proactively disclosed. The lack of transparency and accountability in some contexts can be attributed largely to the lack of data on public services and government performance, rather than to the lack of resources or technology.

For open data at the local level to generate value, standards of quality need to be established and maintained (McKinsey, 2014). But quality data has its costs. In the case of Chennai, city government officials admit that they are unable to provide comprehensive and correct information. Though there is a large amount of data about the city, spatial and non-spatial, digitised and otherwise, that is available in different government departments and agencies, the data are collected and stored in various

formats and locations, making it difficult for both citizens and public officials to access the data. There is no central data repository that can facilitate sharing and consequently, different agencies either do not have complete data or collect again data that were collected by other agencies. In this context of poor quality data, any push for open data will, in parallel, have to include a push to improve the quality of the data, and to ensure that the data used for planning in the future does not lead to the further exclusion of the poor simply because of the poor quality of available information.

This problem is not peculiar to Chennai. One of the case studies in the Philippines highlighted the lack of quality data in both health and micro-enterprises – two sectors that can provide valuable data to help sub-national governments plan better health and economic development services to achieve social and economic ends. However, data is used for transactional and record-keeping purposes only and kept in printed formats. In Kenya, rural residents interviewed by the researchers complained that the data contained in portals are not updated and useful, preventing them from making better decisions based on data.

This does not only point to the lack of capacity, but also to lack of attitude in valuing data on the part of sub-national governments. In some cases, like in the Philippine case mentioned above, data is kept and maintained for internal accountability purposes – as evidence to show that work has been done for a type of transaction and for a set of clients – and less as a means to achieve external accountability. Data was not even kept to plan better or perform future services in a more effective and efficient manner. It has been argued that there is still a need for governments to see the value of open government data (Ubaldi, 2013). A basic building block for this to happen is for them to see the value of data, above all things.

Admittedly, this synthesis is largely dependent on the written research papers and, as indicated previously, there was no opportunity to go back to case authors to provide more information. Despite limitations, this synthesis is able to point out current gaps in our understanding of open government data especially in the context of sub-national governments, and these are presented below for consideration in future research.

First, there is limited understanding on how, like in the case of governance reforms in decentralized contexts, the different levels of governance (e.g. national, province, district, city, municipality) interact to create an environment that would be conducive to greater openness in sub-national data or to greater openness of sub-national governments. It is important, in this case, to understand how open data evolves within different natures of central-local relations. While this paper highlights the role of national legislation in shaping sub-national openness, it also presents cases of sub-national governments creating open data initiatives on their own, even without a national mandate. Understanding these relations is critical in the design of future open data initiatives. Conceptually, context extends beyond the description of national situation or local idiosyncrasies and becomes a description of relations between different actors across various level of state governance.

Second, we have a limited understanding of how different stakeholders access and use open data, or if not, government data, in sub-national contexts. Except for the Kenya case study where we know that rural residents, for example, prefer the radio to access governance

information, there is limited discussion in the other cases on what data citizens, or citizen groups access and use, and how they gain access to these datasets. Who are the users of government data? What data do they need and have? What mechanisms are in place for data access? How are these mechanisms established and implemented? These are critical questions that will help us understand how to create an enabling environment for open government data in sub-national contexts.

Finally, there is a need to define, test and evaluate hypotheses on achieving impact through open data, especially at the sub-national level where the relationship between government and citizens is more proximate and pronounced. In the cases mentioned in this paper, little is said about how open data is theorized to achieve transparency or better service delivery, and how this change can be measured when change occurs. In building the case for open data, we need to have more clarity about how open data can lead to the desired political, social and economic impact.

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