Open Data in Developing Countries

Emerging Insights from Phase I

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This is a synthesis paper drawing on material from Open Data in Developing Countries case studies. See Appendix and

http://www.opendataresearch.org/emergingimpacts for a full list of projects and report authors.

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About the Web Foundation

Established by Sir Tim Berners-Lee, the World Wide Web Foundation (webfoundation.org) seeks to establish the open Web as a global public good and a basic right, creating a world where everyone, everywhere can use the Web to communicate, collaborate and innovate freely.

We work with others to make the web truly universal, open and free, through initiatives such as the Alliance for Affordable Internet (a4ai.org), which aims to bring down the cost of internet access, andthe Web Index (thewebindex.org), which tracks the health and utility of the Web in over 80 countries.

We also put the open web to work to strengthen democracy and participation, especially by helping to harness the power of open data. At the heart of our open data work is a commitment to building local capacity and leadership across the developing world.

Exploring the Emerging Impacts of Open Data in Developing Countries

Exploring the Emerging Impacts of Open Data in Developing Countries is a multi-country, multi-year study led by the World Wide Web Foundation to understand how open data is being put to use in different countries and contexts across the developing world. The project is funded by grant 107075 from Canada's International Development Research Center (idrc.ca) and runs from February 2013 until mid-2015.

www.opendataresearch.org/emergingimpacts

Chapter 1: Introduction

The state of knowledge on open data is advancing rapidly. This report brings together insights from the first phase of the Open Data in Developing Countries research and research capacity building program coordinated by the World Wide Web Foundation, providing a snapshot of key points and provocations for wider debate and discussion.

Open Government Data has an intrinsic appeal. The idea of making data 'open by default' challenges entrenched cultures of state secrecy and calls for data to be treated as a public resource: available to support citizen participation, to improve the delivery of public services and as an input into innovation and enterprise. Although openness is an important modern value, that contributes to freedom and autonomy[1], open data itself is ultimately only a means to an end: or more precisely, a means to many different ends. One such end is development, understood as the sustainable and equitable flourishing of human capacity, against a backdrop of guaranteed human rights. The first year of the Exploring the Emerging Impacts of Open Data in Developing Countries (ODDC) project, through in-depth case study research carried out by local research partners, has been looking at the dynamics through which open data can make a positive contribution to development, as well as identifying the challenges and barriers to realising those contributions.

The concept of open data has spread rapidly around the world. Advocates, funders and governments have rushed to replicate common approaches of building data portals, enacting open data policies and running hackathons, app competitions and capacity building training. Underlying many of these efforts has been an implicitly linear theory of change: data +

intermediaries = impact. In this report, drawing on the preliminary findings from research into open data supply, demand and use across 13 countries on three continents, we explore the need for a more nuanced understanding of how open data can generate outputs, outcomes and impact. We offer a series of insights and provocations, moving towards different models for thinking about open data, development and social change.

In the modern, multi-polar world, where the gaps between rich and poor within countries are often as substantial as those between countries, the simple division of the world into developed and developing is not always a useful one. Many of these insights will be relevant the world over. Yet, countries do vary substantially in terms of their capacities, wealth, technical and social resources and levels of economic and social development: and with a 'data revolution' that includes open data proposed as part of the post-2015 agenda it is important to think critically about open data practices. We need to explore practices that present the 'best fit' for particular countries and contexts, rather than advocating interventions based on externally defined best practices'.

Source material

This paper draws upon draft and published case studies funded through the ODDC project. From March 2013 to June 2014, 17 developing-country based research partners were supported with funding, mentoring and networking opportunities to explore emerging supply, use and impacts of open data in specific settings, from budget decision making, to governance of energy industries.

The Appendix summarises each of the cases, and where available, links to published reports and project outputs. These research teams, including academic researchers, think tanks, civil society organisations and independent researchers, each set their own research questions, but worked with reference to a shared framework [2].

This paper offers an initial synthesis of work from across these cases, drawing also on the wider literature, the Open Data Barometer study [3], discussions held in a series of regional meetings of the ODDC network, and regular network web-meetings. Cases are referred to in the text describing each finding. Footnote citations are given to additional content not contained in case study reports. Additional literature is cited and included at the end of the document.

Image: Members of the ODDC research network launch at OGP Ministerial reception. Lancaster House, London. April 2013.

Case Studies

Opening the gates: will open data initiatives make local governments in the Philippines more transparent? Step Up Consulting

Understanding the impacts of Kenya open data applications and services. iHub Research

Exploring the use and impacts of open budget and aid data in Nepal. Freedom Forum

Open government data for regulation of energy resource industries in India. The Energy and Resources Institute

Opening the cities: open government data in local governments of Argentina, Brazil and Uruguay. Silvana Fumega, Ricardo Matheus and Fabrizio Scrollini

Open data, public budget and its relations to people's rights in Brazil. Instituto de Estudos Socioeconomicos – INESC

The use of open data in the governance of South African higher education. University of Cape Town

Open data in the judicial systems: evaluating emerging impact on policy design in Uruguay, Chile and Argentina. Centro de Implementacion de Politicas Publicas para la Equidad y el Crecimiento (CIPPEC)

Investigating the impact of Kenya's open data initiative on marginalized communities: case study of urban slums and rural settlements. Jesuit Hakimani Centre

An investigation of the use of the online national budget of Nigeria. University of Ilorin

Exploring the impacts of online budget information at the sub-national level in Brazil. Research Group on Public Policies for Information Access (GPoPAI), University of Sao Paulo, Brazil

Opening government data by mediation: exploring the roles, practices and strategies of data intermediary organisations in India. HasGeek Media

The quality of civic data in India and the implications on the push for Open Data. Transparent Chennai, Institute for Financial Management and Research.

How open data could contribute to poverty eradication in Kenya and Uganda through its impacts on resource allocation. Development Initiatives, Kenya, and Development Research and Training, Uganda

Open government in the Philippines: exploring the role of open government data and the use of new technologies in the delivery of public services. De La Salle University, Philippines

Taking stock of the effectiveness and efficiency of open data Initiatives in Sierra Leone. Society for Democratic Initiatives, Sierra Leone

Exploring the open data Initiative of the Ministry of Finance on National Budget Transparency in Indonesia. Sinergantara

Network and regional meetings

This report also draws upon a number of network and regional meetings including:

Full network meeting – April 24th to 26th 2013. Hosted at the Open Data Institute in London, UK.

Latin America regional gathering – July 24th to 25th. Hosted alongside Abrelatam conference.

Asia regional meeting – July 16th – 18th 2013. Hosted at The India Habitat Center, New Delhi, India.

Africa regional meeting – December 7th 2013. Hosted at the University of Cape Town, South Africa.

ODDC meeting at the Open Government Partnership Summit. October 29th 2013. Hosted at the London School of Economics in London.
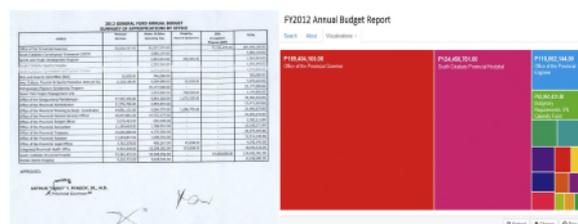

Image: Africa Regional Meeting. University of Cape Town.

Chapter 2: Exploring emerging impacts

The first phase of the ODDC project has focused on qualitative case study led research. It has looked at factors affecting efforts to supply, access and use open data in different settings across the developing world. The case studies, each designed by local partners, have covered issues ranging from budget and aid data, to higher education statistics and local government transparency. Although in some settings researchers have found evidence that open data is being used, and has led to outputs in the form of applications being built or new analysis carried out, in general, examples of, and outcomes from, the direct use of open data are limited. However, open data interventions are not without effects and developing country interest in using open data approaches to address governance and development challenges was evident.

Key insights

- (1) There are many gaps to overcome before open data availability can lead to widespread effective use and impact

- (2) There is a frequent mismatch between open data supply and demand in developing countries

- (3) Open data initiatives can create new spaces for civil society to pursue government accountability and effectiveness

- (4) Working on open data projects can change how government creates, prepares and uses its own data

- (5) Intermediaries are vital to both the supply and the use of open data

Dominoes and Ripples

During the ODDC project we have explored a range of different metaphors for talking about open data and its effects. Metaphors are an important tool to support dialogue around open data – where conversations can otherwise become very technical and inaccessible. Finding accessible narratives for talking about open data will help in building more inclusive initiatives.

We offer two metaphors that are particularly useful for thinking about open data impacts: the domino effect, and the ripple effect[1].

In a **domino effect**, there are a number of different pieces that need to be lined up before open data can trigger outcomes and impacts. These may be pieces relating to data supply, such as data quality and good meta-data. They may be pieces related to intermediary activity, such as the interest, awareness and skills of the media or NGOs to take and use data. And they may be pieces related to the wider political context, such as the receptiveness of the public or of decision-makers to data-driven analysis and arguments. It is possible to configure the dominoes in different orders, and to line them up directed towards different ends. But, if any key domino pieces are missing, the chain-reaction from datasets to outcome and impact may be broken, and steps towards impact stalled. In developing countries, many of the domino pieces are underdeveloped or absent, making it challenging to secure desired impacts.

In a **ripple effect**, the outcomes of open data may be indirect: starting from an open data intervention but spreading out into new areas. The process of thinking about open data may encourage governments to change their systems for collecting data, which may have effects on how they use data internally,

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[1] I owe this metaphor in particular to the case study report by INESC: Beghin, Nathalie; Zigoni Carmela (2014) Measuring open data's impact of Brazilian national and sub-national budget transparency websites and its impacts on people's rights,

with consequent effects on policy and planning. Open data initiatives may create new spaces for government and civil society to work together, building trust or enabling more targeted NGO actions. Unsuccessful attempts to access or use specific dataset from government as part of an open data project may still build interest in having better data, and so lead to civil society generating new data that can be used in advocacy or in the delivery of public services. It may be hard to attribute these impacts entirely to the use of a specific open dataset: rather, they emerge around the introduction of open data ideas and practices in general. In a ripple effect, interventions may start small, but, with the appropriate support, can scale outwards.

These two concepts are not mutually exclusive: open data theories of change may have elements of each[2]. Ripples spreading out from open data interventions may lead to more sustainable but subtle change, whereas a successful domino effect is likely to lead to more visible and high-profile stories of impact.

Through these metaphors we can ask a number of important questions:

- What pieces need to be in place before open datasets can lead to change in a particular country or setting?

- How do different configurations of those pieces lead to different kinds of impacts being easier or more difficult to secure?

- How alike or different are the sets of dominoes for developing and developed countries? Are the same elements required in every country, or are there different ways of filling the many gaps that currently prevent open data impacts being widely realised?

- Who is affected by the ripples of an open data intervention? Are the effects reaching all citizens? What prevents those ripples spreading further?

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[2] For example, it may be take a domino effect with all the key pieces of data, connectivity, interested entrepreneurs and technical skills lined up to lead to the creation of a widely used mobile application about schools or other public services. It may then take a ripple effect for use of that tool, and the awareness it creates, to influence changes in public policy. Different potential gaps or barriers to impact exist at each stage.

Key insights in detail

(1) Chain reactions?

Data can be a powerful ingredient in securing greater transparency and accountability, more inclusive policy making, better public services, or entrepreneurial activities. When surveyed by ODDC projects, many citizens and NGOs articulated a demand for more and better government information and data. Yet, in many of the cases we explored across the developing world, the supply of open data was very limited. Data that is made available is often not machine-readable, does not use common standards, and is rarely explicitly licensed. Early data portals in developing countries, such as opendata.go.ke, have not been updated with the latest data series, hampering sustainable and ongoing data re-use. There is much work to do to increase the availability of open data.

However, there is more to securing impact of open data than the datasets themselves. Figure 1, developed by Craveiro et. al. for their case study of geo-coded budget data in Sao Paulo, Brazil, identifies a number of stages between data and impact. For example, appropriate legal frameworks, domain knowledge and technical skills are all important background resources for carrying out activities that turn data into relevant information and knowledge. These activities may generate outputs such as web applications, reports, analysis and new derived datasets. Whether these outputs can lead to outcomes will depend on the contextual environment, and how those outputs themselves are used. An exploration by iHub Research in Kenya found very low levels of use for open data applications, in part because of the limited promotion they had received. It is only with

ongoing research over time that it is then possible to establish whether any outcomes from open data interventions have long-term political, social and economic impacts.
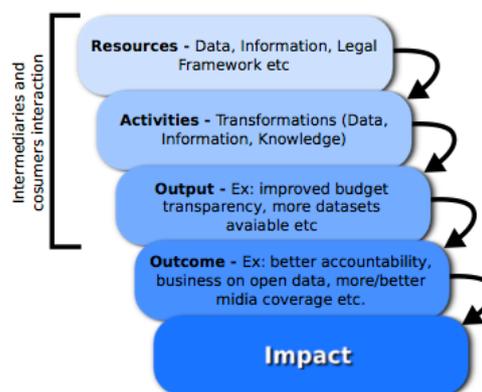
Figure 1: Steps to open data impacts. Source: Craviero et. al. (2014). http://colab.each.usp.br

Issues of access to technology, the language that datasets are published in and the absence of technical skills in established NGOs can all create gaps between open data, outcomes and impacts.

The wider political context is also important in shaping what impacts open data may have. In surveying budget data users in Nigeria, the University of Ilorin found a reasonable level of confidence in the potential benefits of data for government efficiency, but a low confidence in the potential of data to bring about greater accountability.

Whilst capacity building projects often try to address these gaps one-by-one, a number of ODDC cases explored the importance of building 'ecosystems'. An eco-system approach can holistically address the capacities and relationships around specific domains and datasets in order to support open data activities, sustainable outputs and developmental

outcomes.

The Importance of Affordable Access
According to 2013 Web Index data [4], countries covered by ODDC studies have levels of fixed broadband Internet access ranging from 0.008 connections per 100 people (Nigeria) to a maximum of 17 connections per 100 people (Uruguay). Mobile broadband is increasingly available, and in many countries mobile is one of the main platforms for connectivity – yet penetration rates remain below 32% in all the ODDC countries, and as low as 1.5 connections per 100 people in Sierra Leone. Most of those who are not connected to the Internet are not online because they simply can't afford to be. In the developing world, the average cost of broadband Internet ranges from 11% to 30% of average monthly incomes [5].

When working with data, it is not only connectivity, but affordability and the quality of that connectivity also, that matter. Affordable broadband is an essential foundation for securing impacts from open data. The Web Foundation hosts the secretariat for the Alliance for Affordable Internet, a global coalition of public, private and civil society organizations working to secure affordable access to fixed and mobile broadband for developing countries.

Find out more at http://www.a4ai.org

(2) Mismatch of supply and demand

Not all datasets are equal. When it comes to assessing open data impacts, the subject matter of the dataset is important. The Open Data Barometer study found that, although more and more countries are making open data available, politically sensitive datasets and those that are crucial to supporting accountability efforts are amongst the least likely to be published [3]. In a number of developing countries key datasets, such as company registers, digital maps, and land-registration databases are simply not held in digital forms as the state lacks the capacity or systems to manage them.

A number of ODDC partners have looked to develop methods that go beyond assessing the existence of an open dataset, to looking inside the dataset and operationalizing criteria to judge whether data is complete, primary and timely. These assessments are necessarily specific to countries (based on national laws about what data should be disclosed) and domains (e.g. complete budget data is different from complete transport data). A lack of, or limited use of, open data standards in areas such as budget and contracting means that even when data is of a good quality, it can be hard for re-users to join up datasets from different levels of government or different localities and to get a citizen-centered picture of government. Better ongoing monitoring of data quality and compatibility may help to drive up supply and standards of data over time.

Although ODDC studies generally found high levels of demand for more information from government, this does not always translate into demand for open data. As STEP Consulting found in studying the potential for open data in implementation of the Philippines local government Full Disclosure Policy (FDP), NGO intermediaries rarely articulated demands for the kinds of data the policy provides, and it was only businessmen who were actively using procurement plans available through the FDP to support their business planning. NGOs may lack the skills to work with data, or the understanding of how access to raw data could help them in their

work. Interactive data visualization may go some way to showing the potential of data and building demand, but many NGOs have established ways of working with information from government that would need to change before they are likely to make demands for structured and machine-readable data. Similarly, in Nepal Freedom Forum's small-scale survey of budget data users found that journalists were the group least likely to seek out or demand access to datasets, preferring to rely on their existing working practices and their use of personal contacts to access budget information.

Through a national survey, and a survey of citizens in urban slums and rural settlements of Kenya, the Jesuit Hakimani Center found there was a mismatch between the data citizens want and the data being provided through the government open data portal. This study also argues that the kinds of data needed to support service delivery in Kenya may be different from those needed elsewhere in the world, suggesting that initiatives need to be more demand-driven and to respond to local context and priorities.

A data-quality mismatch may also affect economic re-use of data. In developed countries it is the broad coverage and high quality of much state-owned data which has made is so attractive for commercial re-use [4]. Where government data quality is currently low, it may not meet the data-demands of entrepreneurs. As a result, opportunities for economic benefit may be lost, or firms will turn to other, more proprietary, sources and strategies in order to develop data-driven innovations.

Until there are better connections between open data demand and supply in developing countries, many potential

impacts are likely to be missed.

(3) Creating new spaces

In many countries, the idea of opening government data enters the picture against the backdrop of entrenched cultures of state secrecy and profound challenges of corruption and unaccountable government. In these settings, the concept of open data, and the discussions it creates, may be as important as access to datasets themselves: offering important new spaces for debate and action around transparent, accountable and effective governance.

In some countries, this debate builds upon recently enacted Right to Information (RTI) laws. In other countries open data initiatives have begun in the absence of RTI laws or whilst draft bills remain awaiting parliamentary approval (often for many years). In both cases, the idea that government data should be 'open by default' [5] creates new opportunities for civil society to articulate demands for proactive publication of specific information and data and for new alliances to be built that advocate for more and better data in particular sectors.

This is one of the ripple effects of open data: changing the nature of legitimate claims civil society can make and shifting the terms of debate around government transparency. However, although NGO awareness of the idea of open data is growing in many countries, only a small community of actors are fully engaged in open data debates. Broadening this community by linking open data to domestic priorities and issues is a vital area for future focus.

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Connecting Right to Information and Open Data in Sierra Leone

In October 2013 Sierra Leone passed a strong Freedom of Information Law [8] following years of campaigning. In training sessions on the new law, facilitated by ODDC partner the Society for Democratic Initiatives Sierra Leone (SDI), and supported through ODDC project mentoring, discussions explored the prospect of creating a division on open data within the newly established Information Commission. This would build on the foundation of proactive publication in the FOI law, and would enable a dedicated commissioner to support Sierra Leone to also look at making sure proactively published information is made re-usable, shared as structured data whenever possible [9].

(4) Changing government data use

Another ripple effect of open data can be seen in changes to how governments and other institutions create, prepare and use their own data. In the city of Sao Paulo in Brazil, third-party geo-coding of government budget and spending data by the Caring for My Neighborhood project has led to conversations inside the city government about how to better capture project information to support more detailed geo-coding in future. Data standards created for open data may also lead to changes in internal data management, acting not only as a format for outputting data, but also providing a set of shared practices for collecting and structuring data internally.

Opening data can encourage government officials to think about the audience for their data. Rather than just providing data to some higher-up authority or ministry as part of reporting requirements, they may come to treat it as an asset for both internal and external use. However, in looking at the availability and use of judicial data in Latin America, CIPPEC found that a focus on releasing data solely as part of transparency obligations led to missed opportunities for the internal use of data as a tool for better policy and planning. This highlights that the agendas driving open data release may shape how it is used.

It appears that many early adopters of open data in the technology community also have improving government data use as their focus. Application developers interviewed by iHub Research in Kenya suggested that they saw the government, rather than citizens, as the primary audience for the web tools they built. Their intention was to encourage improved handling and use of state data by officials by showing data in new ways. This is an example of open data apps acting as advocacy interventions that demonstrate potential, rather than just being valued for the particular functions they provide to end users. This kind of exploratory phase of an open data initiative, in which developers use government data to imagine how the state could work better, rather than to directly provide transactional services, may be an important part of the open data journey in a country, and deserves further study.

Increased availability of open data also allows researchers and data re-users outside government to highlight inaccuracies and inconsistencies between datasets. Whilst that does not automatically lead to data problems being fixed (as there may be political and practical barriers to overcome for this to happen) it does support a more critical public conversation about data quality, and can create pressure on government to address this.

(5) The importance of intermediaries

A recurring theme across ODDC case studies has been the importance of intermediaries who can translate data into information, knowledge and action. The role of intermediary is not just a technical role, and in many countries, intermediaries will necessarily be drawn from outside conventional technology arenas.

Transparent Chennai's work as an intermediary in India has involved sourcing government data from different sources, and validating this data through work on the ground with marginalized communities, acting as a bridge between online and offline data collection and presentation methods. In Kenya, the Jesuit Hakimani Trust found that community centers, chief centers, churches, mosques and community radio were all important venues that citizens use to access information, yet were rarely considered in conversations around open data intermediation. At the dissemination event for this research in Nairobi, critical conversations emerged about the disintermediation potential of open data: particularly where current citizens are tied to using particular intermediaries, who may abuse the positions of power this gives them[3]. By creating diverse routes to information (and potentially creating alternative services), open data could give the important option of 'direct' access, although findings suggest that for many citizens trust in local institutions plays a significant role in their choice to use these, as opposed to turning directly to digital channels for information.

INESC, in a study of budget transparency in Brazil, highlight the importance of

considering the distinction between 'use' and 're-use' of data, and the role the intermediary may play during re-use of processing, remixing, analyzing and re-shaping the data that is provided for others to use. Most open data initiatives are designed such that end-users either need technical skills, or need to rely on an intermediary, in order to extract information from datasets.

Separate projects by Sinergantara and the University of Cape Town demonstrate that intermediaries are not just important as users and re-users of open data. They often play a vital role in articulating demand for data, and in working with government to implement the supply of open data. In their study of budget data transparency in Indonesia, Sinergantara found that the absence of civil society intermediaries from the process of implementing open data concepts has meant that implementation is not tailored to civil society audiences, and so the data is less likely to be effectively used. Studies of higher education governance by OpenUCT found that intermediary organisations can act as a 'keystone species' in open data ecosystems, interacting with both users and suppliers of data. Governments may also be their own intermediaries in some cases, with one part of government acting as an intermediary for others, or for the public.

Experiences across the ODDC network also point to a particular dynamic in which technically-skilled organizations gain access through their open data experience, and come to play novel insider-outsider roles with government, working at a technical level on project implementation whilst also shaping open datasets and standards in the process. Organizations playing this role may be NGOs, but may

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[3] Building Open Data Infrastructure & Strategies For Effective Citizen Management (Video recording) https://www.youtube.com/watch?v=wJQkfdYMhvg [Accessed 11[*] July 2014]

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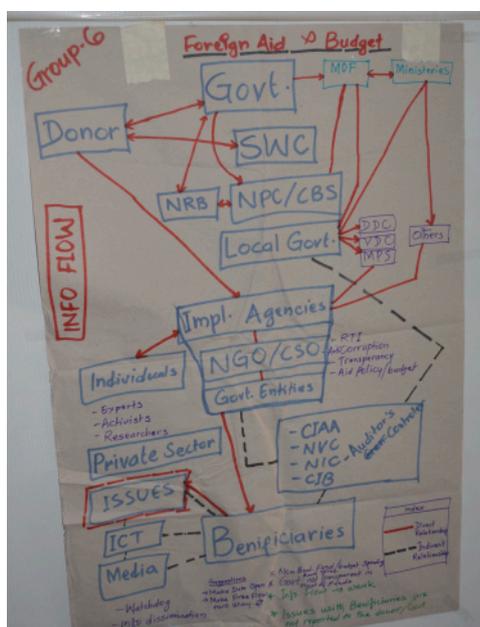also be commercial firms. It is important to consider which intermediaries are involved in shaping data supply, and to consider what impacts this has for the kinds of data made available and how it is supplied.

Chapter 3: Context and challenges

The enablers and barriers for wider publication and use of open data in developed countries have been widely discussed in the research literature [6]–[8]. Less attention has been given to additional challenges that might arise in developing countries, and the consequences of these for the design of open data interventions. In this chapter we consider a non-exhaustive list of issues that arise across ODDC cases on both the supply and demand side of open data.

Key insights

(6) Digital divides create data divides in both the supply and use of data

(7) Where information is already available and used, the shift to open data involves data evolution rather than data revolution

(8) Officials' fears about the integrity of data are a barrier to more machine-readable data being made available.

(9) Very few datasets are clearly openly licensed, and there is low understanding of what open licenses entail. There are mixed opinions on the importance of a focus on licensing in different contexts.

(10) Privacy issues are not on the radar of most developing country open data projects, although commercial confidentiality does arise as a reason preventing greater data transparency

Key insights in detail

(6) Digital and data divides

Limited access to technology, connectivity and digital skills are barriers to both publication and use of data in many countries. In Sierra Leone for example, much government information is still managed on paper at local offices, and is not digitised. The Open Data Barometer found that land ownership records are only partially digitised in many developing countries [3]. And studying the landscape of energy industry data in India, The Energy and Resources Institute discovered that many agencies lack the trained staff to keep key data series up-to-date. These issues vary from country to country, and dataset to dataset.

Data divides also affect who can access and make effective use of open data, either directly or through intermediaries. A number of ODDC projects draw upon Gurstein's framework [9] for effective use. This framework elaborates seven important components that are required for empowerment from open data: Internet access, computers and software, digital skills, data content and formatting (including the language of datasets), interpretation and sense-making capacity, advocacy resources, and governance. These components may be unequally distributed across a country, or across different communities and groups within a country. The experiences of the Opening the Cities project suggest that urban areas often bring together access to key components better than rural areas can, but even then, only more affluent sections of the population may have easy access to applications or services built on top of open data.

Web We Want: Centralised or Decentralised Open Data

The original design of the World Wide Web supports decentralised publishing. Building on an open Internet, the web allows linkages to be made between datasets published by different actors in different places. Yet, over recent decades we have seen many key aspects of the Web such as search and social media become, in practice, increasingly centralised. We have also seen growing threats to the underlying infrastructure of an open Internet. Together, these shifts shape the distributions of power online and in society more widely. The Web We Want campaign is building a global movement to protect an open Internet and to continue to pursue the development of the Web as a platform that can support democratic empowerment and social change.

With the right tools and frameworks, open data and open standards can support decentralisation of data access, use and analysis. However, the demand for consistent and high-quality open data can also lead to an increased use of centralised systems. Similarly, technologies that can help support access to large open datasets are often, in practice, developed as centralised systems. Creative and innovative approaches are needed to re-imagine how open data could be practiced in more decentralised ways in developing countries.

Find out more at www.webwewant.org

In ICT for Development discourses there is a substantial focus on the potential of mobiles to bridge digital divides. In Kenya, whilst Internet penetration is growing rapidly through mobile phones, the feature phones that most users have may not support the kinds of smart-phone targeted open data applications being built. Furthermore, lab-based user experience tests conducted by iHub Research found that users preferred accessing data-driven applications through a desktop/laptop screen, rather than on mobile. This suggests a need for more critical exploration of how far mobile phones can help bridge a digital divide when it comes to open data.

At the ODDC regional meeting in Delhi, India, it was suggested that open data could help in overcoming digital divides. By allowing third-parties to build local language applications using open data, many more localised digital government services can be made available than a central government itself would be able to provide. This 'government as a platform' (REF) argument relies upon the emergence of business models that allow third-parties to sustainably provide such services to the bottom of the pyramid. It is not clear, however, that the government as a platform model is a relevant one for most developing countries, both for cultural and capacity reasons. There are also concerns about where economic benefits of open data will accrue. In some countries, such as Nepal, researchers heard concerns that neighbouring countries may be better equipped to exploit open data for economic gains through their established ICT industries, leaving some countries opening their data but unable to reap the full returns at home.

With large claims made about the potential economic and social value of open data [10], [11], it is important for continued work to understand how digital divides affect the distribution of those benefits both between and within countries.

(7) Revolution or evolution?

Much of the information becoming available as open data in developing countries is not 'new' information. Instead, information series that have previously only been released ad-hoc or through personal contacts, or that have only been available in PDF or hard-copy, are now being proactively published online and may have become available in machine-readable formats.

This means that existing ecosystems and practices for accessing and using this information come to co-exist with new open data ecosystems. This may mean that the new open data offers marginal, rather than radical, gains for re-users and end-users, and creates challenges for building sustainable open data ecosystems. However, it may also lead to disruption of existing data-use practices, encouraging positive developments in how data is re-used in governance, decision-making and advocacy. Equally, disruption may have negative consequences, though none were specifically identified through ODDC cases.

Cultural factors play a big role in shaping how ideas of open data as a disruptive innovation may be received. Where existing intermediaries can see value in demanding and using open data, or can partner with new, technically skilled, intermediaries this may support a step-change in their ability to create change, rather than a change in direction.

Many open data interventions are currently based on a deficit model: looking at gaps in NGO or country skills that limit use of data, and intervening with short-term training and capacity building. An alternative approach would look at the assets, strengths and working practices of existing organizations, and would explore how data might build on these. However, asset based approaches may need to recognize that transitions from information driven advocacy to data driven advocacy are likely to take an extended period, and require longer-term investment.

There are also opportunities for an evolution of practice on the supply side of open data. In looking at how information and data on maternal health currently flows amongst local health workers in the Philippines researchers from De La Salle University identified the physical 'Spot Maps' displayed and updated in offices as a key space through which data is currently exchanged. They recommend focusing on these and other health field notes when considering opportunities to introduce machine-readable open data into the local health sector.

Open data initiatives in developing countries should also consider what effort is required to make entirely new datasets available, and how to move from 'low hanging fruit' datasets, to focus on the datasets that citizens are interested in. These datasets may not have previously been disclosed in any form, or that may even need to be generated through shared government and civil society activity.

(8) Building confidence in open data integrity

Technical barriers are not the only reason for a limited supply of machine-readable data in developing countries. In many cases ODDC researchers found established

working practices inside government that led to only PDF or printed and scanned copies of documents being made available online, even when digital copies were held. Data shared in PDF or scanned document formats cannot be easily analysed, remixed and re-used, and does not qualify as open data according to the Open Definition.

One of the recurring reasons given by officials for not publishing machine-readable data was a concern about the potential for manipulation and misuse of the data if it was easy for re-users to edit it. This concern was particularly raised in areas where there were high levels of political tension, or past experiences of data being used in political debates. In many cases, this reluctance to publish machine-readable formats appeared based on a lack of understanding that only copies could be modified, and that the copy held on government servers would not be altered just because re-users could make edits to the copies they had downloaded. Educating officials that the integrity of an official copy of data is not affected by providing a machine-readable version is important to address this.

It is important for governments to be able to provide authoritative records as well as open data, particularly if data is to be used for transparency and for holding government to account effectively. In some countries the authoritative copy of a document will be the one with an official ink stamp or signature on, and so there can be a good reason for making the scanned copies of these documents available on the web. The web as a medium can support effective linkages between document and dataset versions of the same information. Identifying how records management and open data practices can be aligned and

joined up in developing countries is a key area for future exploration.

(9) Unclear licensing

A license sets out the specific conditions under which some piece of content may be used or re-used. In open data advocacy the presence of explicit open licenses for datasets has often been given a high-priority (REF – Census). Across the datasets explored by ODDC case studies, very few had explicit open licences attached. In some cases, this may be because of a background assumption that government provided data is in the public domain, or because of a cultural context in which license restrictions on software and data are widely ignored in practice. In other cases, it appeared to be because little consideration had been given to the potential for re-use of data.

Interviewing budget data intermediaries, INESC found that whilst many were from organisations that paid attention to licensing issues (for example, through applying explicit creative commons licenses to their own websites), few felt licensing was a relevant issue to the civic re-uses of data they were undertaking.

Licenses may turn out to be particularly important for supporting the development of a global commons of interoperable data, but less important for local and specific data re-use. This raises questions about how the relative emphasis to place on licensing issues in grassroots open data projects, and the need for further discussion of licensing issues in different countries and communities.

(10) Privacy and commercial confidentiality

A number of important datasets that governments could release as open data are derived from information about individual citizens. Releasing these datasets involves a careful balance between releasing suitably disaggregated data, and releasing data that could affect individual or community privacy. Managing privacy issues in the release of open data requires attention at both the policy and the practice level. However, less than half the developing countries covered by ODDC cases have dedicated Data Protection Laws in place, and issues of privacy did not feature as a significant element in any of the interviews carried out by projects. In an ODDC Web Meeting run jointly with Privacy International, the importance was raised of identifying datasets that could give rise to privacy considerations and distinguishing these from datasets with no privacy concerns. Through this, privacy can be addressed when relevant, but the potential for privacy concerns to be used as an excuse for not releasing data can be avoided.

There are also important government datasets that are derived from information supplied by companies through regulatory obligations. In their survey of data from energy industries, TERI found that a lack of clarity over commercial confidentiality led to limits on the data that was made public or available for analysis and re-use. In many fields, including public contracting, a debate may be needed as to the boundaries between commercial confidentiality and the public interest in open data.

There is no one-size-fits-all approach to open data. Standards are important, but so is local contextualisation to find the 'best fit' between open data tools, technologies and practices and the geographical, institutional, political and cultural setting where they are being introduced. In this section we highlight a number of considerations for the design of future open data interventions in developing countries. These are offered as the basis for discussion and future research, rather than as final conclusions of the ODDC project.

Key insights

(11) There is more to open data than policies and portals

(12) Open data advocacy should be aware of, and build upon, existing policy foundations in specific countries and sectors

(13) Open data is not just a central government issue: local government data, city data, and data from the judicial and legislative branches are all important

(14) Flexibility is needed in applying definitions of open data in order to allow locally relevant and effective open data debates and advocacy to emerge

(15) There are many different models for an open data initiative: including top-down, bottom-up and sector-specific

Key insights in detail

(11) Beyond the portal

An open data portal provides a very visible symbol of an initiative. It can act as a focal point for the release of datasets, and can help potential re-users discover data. The best portals facilitate interaction between data re-users and officials inside government responsible for managing datasets, helping build communities of practice around data. However, portals are only one part of the wider open data picture, and can risk distracting attention from other reforms and groundwork needed for sustainable and effective open data initiatives in developing countries.

Many of the NGOs surveyed during ODDC case studies were already accessing and using government information – but often did so by going direct to departmental websites. If data becomes available through a central portal but not on department websites, potential re-users may not discover it. Responding to this may require attention to the data handling skills and practices in line-ministries.

The creation of national open data policies creates the opportunity for public conversation around key priorities, and allows for clear leadership on open data issues to be established. In Kenya, where the open data initiative has not been backed by a clear open data policy, progress quickly stalled when officials and politicians changed. Yet, open data policies and portals alone cannot build the broad ecosystems needed for successful open data.

In their study of potential open data intermediary NGOs in India, HasGeek suggest the need for a stronger culture of open data sharing in general, with NGOs encouraged to also share key data resources they have, or that they have generated from government data.

There are also many opportunities to build open data elements into existing initiatives as discussed in the next section.

(12) Building on existing policy

In their study of the Philippines local government Full Disclosure Policy (FDP), STEP Consulting explore the potential to add open data requirements to the existing transparency mandate. By both encouraging a more demand-driven selection of disclosure requirements, and developing standards for machine-readable data, the existing FDP policy could be developed to provide a supply of relevant open data for local use. In Indonesia, Sinergantara have suggested that the concept of open budget data is more likely to be successful if it can build upon and extend existing discourses about budget transparency.

Whether open data is most powerfully introduced as a brand new concept and policy, or is best framed as an iterative development of an existing initiative or agenda will vary from sector to sector. ODDC cases have pointed towards the need for appraisals that can help find specific national and sectoral 'hooks' for advancing open data.

(13) Open data across all of government

Open data is not only an issue for the executive branch of government. Open data initiatives can also be developed in both the legislative and judicial branches, as well as at state, local government and city levels. For example, CIPPEC surveyed

the country contexts for open judicial data in Chile, Uruguay and Argentina, discovering limited awareness of the concept of open data, but many foundations in place to allow national judiciaries to provide administrative and financial data. They argue that opening judicial data is a vital piece of the open government picture. To successfully bring open judicial data close to citizens, however, not only would national courts need to provide open data, but moves towards openness would also be needed at the local level.

This is true across branches of government. For many citizens the data of most relevance to their day-to-day lives exists at a local level. The Opening the Cities project details how urban areas can effectively pursue open data policies through a range of different approaches. As city infrastructures becoming increasingly digitised through smart cities agendas, ensuring openness is built into the idea of urban governance is an area for further work.

(14) Defining openness and open data

Smith and Reilly argue that openness is a layered and complex concept [12] describing processes as much as it describes a state. A dataset being effectively open in different developing country contexts may not be the same as being formally open when measured against a tool like the Open Definition. This works in both directions.

The Open Definition [13] plays an important role in building a global commons of data. Datasets that meet the Open Definition are legally compatible and combinable with other Open Definition datasets. The definition, which requires that data be proactively published, machine-readable,

clearly licensed and free of charge, also acts as a measure against which policies and practices can be judged. Yet, few datasets in developing countries come up to that measure, and many fall a long way short.

Towards common methods
In May 2014 the Web Foundation and the GovLab at New York University hosted a workshop to explore Common Assessment Methods for Open Data. By harmonising indicators, methods and research tools, and developing a common framework for measuring and assessing open data activities, this project seeks to strengthen the open data evidence base, and make it easier to join up between studies and carry out comparative work.

The draft Common Assessment Methods framework identifies four core components for research:

(1) **Context and environment** for open data;
(2) The supply of **data;**
(3) The **use** of data;
(4) And outcomes or **impacts**;

Under each component the framework offers suggested questions and indicators. The framework will continue to be developed over the coming year, with the inclusion of shared operational definitions for key terms. It offers a globally relevant resource for planning and executing research and evaluation of open data activities.

Type / Characteristics	State-led environment	Civil Society-led environment	Entrepreneur-led environment
Objectives	Promote the use of social services	Use of social services, transaprency and accountability.	Profit making
Resources	Data already available, if in open format, spurs inter-agency and inter-agency innovation. Possible contractors and in-house teams carrying out the work.	If data is available civic society is able to improve current services and develop new ones based on volunteer work or specific grants.	If data is available entrepreneurs devote their own time, or funds from investors, to projects.
Focus	Provision of public goods.	Provision of public goods	Provision of private goods, and public goods if this is aligned with profit-making incentives
Sustainability	If embedded in a cities strategic activities applications can be sustainable.	Depending on civil society resources and volunteers.	Depending on data availability and profitability of the service.
Replication	Ideas replicable and technology as well, depending on whether public software was used.	Ideas replicable and technology as well depending on whether public sofware was used	Ideas replicable depending on business model and scale.

Applying the definition in a binary or exclusionary way is a good strategy when open data has become well established in order to maintain the quality of data supply. But in the early stages of open data in a country, inflexibility can inhibit moves towards opening up. Anecdotal evidence suggests officials, realising the challenges in moving from closed data, to fully machine-readable and openly licensed data, may be deterred from starting if their early steps towards openness are criticised as 'not open', rather than recognised as steps on the way towards openness. A question raised, but not answered, in the first phase of the ODDC project, has been whether developing countries need to define their own notions of openness, drawing on their own cultural and practical situations.

For developing countries it may at the very least be helpful to always break down the meaning of open data into its constituent parts of proactive publication, machine-readability, non-proprietary format, and permissions of re-use[4] in discussions or

It is important to note that the Open Definition does not require an explicit license, but rather requires that the effective conditions around a dataset meet the conditions of an open license. For example, where the default legal position in a country is that state data is in the public domain, no explicit license statement is *required* by the definition. This is not currently taken into account adequately in most open

assessments of moves towards openness. Such a breakdown when researching impact can also help target future efforts to the component changes with most effect on development.

(15) Many models

Across the ODDC network we have found many different models of open data initiative. These include top-down initiated projects, led by governments and donors; bottom-up efforts led by technology communities or civil society organisations; and sector-specific initiatives focussing on very specific datasets. In top down initiatives, such as that of Rio de Janeiro, officials or politicians drive the choice of datasets and the design of competitions or events to catalyse data use. The initiative may be oriented towards solving particular problems identified by the government. In bottom-up initiatives, civil society, or sometimes employees inside government, may start prototyping ways of collating, releasing and re-using open data, with this either adopted by government or continued as an independent project. Uganda's open development initiative is an example of bottom-up open data activity, with a non-governmental coalition starting the open data conversation, but increasingly connecting up with government officials.

In a comparison of open data initiatives across Latin American cities, the Opening the Cities project distinguishes between state-led open data environments, civil society-led environments, and entrepreneur-led environments (see Table 1). Each kind of environment has distinct objectives, resource requirements and models for replication or scaling. In practice, open data initiatives may combine elements of different environments, and

elements of top-down and bottom-up leadership.

There is no one-size-fits-all approach to open data. More experimentation, evaluation and shared learning on the components, partners and processes for putting open data ideas into practice must be a priority for all who want to see a world where open-by-default data drives real social, political and economic change.

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data assessment tools (including the 2013 Open Data Barometer).

Chapter 5: Conclusions and future work

This report has presented a snapshot of initial insights and issues for discussion from the first phase of the Open Data in Developing Countries project. In the coming year, the project will continue both primary and secondary research, focussing on a number of sectoral and cross-cutting issues such as budget data, data standards and the relationship between Right to Information and Open Data.

The overarching objective of the ODDC project is to establish practical and actionable knowledge about effective strategies for employing open data as means to achieve greater openness in government, to support citizens' rights, and to promote more inclusive development in developing countries. The project does this through both direct research, and through research capacity building with partners across the developing world. This report presents a snapshot synthesis of some of the insights coming out of the research undertaken between March 2013 and June 2014.

The fifteen key insights focus on the 'how' of open data, as much as on the 'what' and the 'why'. Each point is offered as a conversation starter, and spark for further research, rather than a final conclusion.

Key insights summarised

(1) There are many gaps to overcome before open data availability, can lead to widespread effective use and impact

(2) There is a frequent mismatch between open data supply and demand in developing countries

(3) Open data initiatives can create new spaces for civil society to pursue government accountability and effectiveness

(4) Working on open data projects can change how government creates, prepares and uses its own data

(5) Intermediaries are vital to both the supply and the use of open data

(6) Digital divides create data divides in both the supply and use of data

(7) Where information is already available and used, the shift to open data involves data evolution rather than data revolution

(8) Officials' fears about the integrity of data are a barrier to more machine-readable data being made available.

(9) Very few datasets are clearly openly licensed, and there is low understanding of what open licenses entail. There are mixed opinions on the importance of a focus on licensing in different contexts.

(10) Privacy issues are not on the radar of most developing country open data projects, although commercial confidentiality does arise as a reason preventing greater data transparency

(11) There is more to open data than policies and portals

(12) Open data advocacy should be aware of, and build upon, existing policy foundations in specific countries and sectors

(13) Open data is not just a central government issue: local government data, city data, and data from the judicial and legislative branches are all important

(14) Flexibility is needed in applying definitions of open data to allow locally relevant and effective open data debates and advocacy to emerge

(15) There are many different models for an open data initiative: including top-down, bottom-up and sector-specific

Future work

Over the coming months ODDC partners will each be continuing to explore their own local research agendas, and the project as a whole will be working to continue synthesis of findings from the first phase – linking these to the project conceptual framework [2].

Through this we will link these insights, and other arising insights to the core elements of:
- Context;
- Supply of open data;
- Technical platforms and standards;
- Specific governance settings
- Intermediaries
  and
- Use, outcomes and impacts.

Further work will dig in depth into thematic areas, both through cross-case analysis, and through further primary research. Information on our on-going work will be published at
http://www.opendataresearch.org/emergingimpacts/

Appendix: Project details

The following partners received research funding and support through the Open Data in Developing Countries project. Projects were selected through an open call for proposals issued in mid-2012. Below we detail each project, and link to available and forthcoming reports and outputs.

An Investigation of the use of the Online National Budget of Nigeria
University of Ilorin, Open Data Research Group. Ilorin, Nigeria.

A mixed-methods study of the supply and use of budget data in Nigeria, combining interviews and media monitoring of newspapers and social media to explore the source of budget stories.

Links: Project details; Case study report (forthcoming); Dissemination event (7th April 2014, Abuja, Nigeria); Research poster.

Investigating the impact of Kenya's open data initiative on marginalized communities: case study of urban slums and rural settlements
Jesuit Hakimani Centre. Nairobi, Kenya.

The study, conducted in two urban slums in the Counties of Nairobi and Mombasa and a rural settlement in Isiolo County, employed quantitative and qualitative research techniques, including focus groups, questionnaire and interviews that were designed to assess awareness and use of the Kenya Open Data Initiative data, and to understand the ways in which citizens seek out, access, use, and place trust in, government information.

Links: Project details; Case study report; Dissemination event (30th April 2014, Nairobi, Kenya); Research poster.

Open data in the judicial systems: evaluating emerging impact on policy design in Uruguay, Chile and Argentina
Centro de Implementacion de Politicas Publicas para la Equidad y el Crecimiento (CIPPEC). Buenos Aires, Argentina.

Using a comparative design, this study explores developments in open data production, collection and publication by the judicial branches of Argentina, Chile and Uruguay.

Links: Project details; Case study report; Policy brief (Spanish); Video; Dissemination event (8th May 2014, Buenos Aires, Argentina); Research poster.

The use of open data in the governance of South African higher education
University of Cape Town, Open UCT. Cape Town, South Africa.

Drawing on an eco-systems perspective this study analyses the flow of higher education administrative data within South Africa, focusing in particular on a Centre for Higher Education Transformation (CHET) project that provides higher education performance information as open data.

Links: Project details; Case study report (forthcoming); Conference papers; Shared datasets.

Open data, public budget and its relations to people's rights in Brazil
Instituto de Estudos Socioeconomicos – INESC. Brasilia, Brazil.

Combining a study of budget transparency websites across 27 state capitals, the federal government and the senate in Brazil, with qualitative interviews with open data intermediaries and users, this study explores how far budget data is available and how far it is being used to lead to outcomes with impacts on rights issues.

Links: Project details; Case study report (English / Portuguese);.

Opening the cities: open government data in local governments of Argentina, Brazil and Uruguay
Fabrizio Scrolini, Silvana Fumega, Ricardo Matheus

Through independent studies using a shared framework looking at city open data initiatives in Sao Paulo and Rio de Janeiro (Brazil), Montevideo (Uruguay) and Buenos Aires (Argentina) these studies build towards a comparative assessment of how open data is supplied and used in urban areas in Latin America.

Links: Project details; Case reports: Montevideo; Buenos Aires; Sao Paulo (forthcoming); Rio de Janeiro (forthcoming); Research poster.

Open government data for regulation of energy resource industries in India
The Energy and Resources Institute. Delhi, India.

This project has examined the availability, accessibility and use of open data in the extractive energy industries sector in India. It looked at the impact of existing instruments and initiatives relating to coal, petroleum and natural gas, and explored opportunities to enhance the openness of government data for the extractive resource sector.

Links: Project details; Case study report; Research poster; Policy Brief; Dissemination event report (8th July 2014, Delhi, India)

Exploring the use and impacts of open budget and aid data in Nepal

Freedom Forum. Kathmandu, Nepal.

Through two parallel studies this project looks at demand for, and use of, budget and aid data in Nepal.

Links: [Project details](#); [Research poster](#) (initial findings); Case reports in progress.

Understanding the impacts of Kenya open data applications and services
iHub Research. Nairobi, Kenya.

This study combined data from web analytics, surveys, interviews and usability testing to build up a picture of the role that intermediary application play in making government data from the Kenya Open Data Initiative accessible and useful. It explores issue of application sustainability.

Links: [Project details](#); [Research brief](#); Case study report (forthcoming); [Dissemination event (30th April 2014, Nairobi, Kenya)](#);


Opening the gates: will open data initiatives make local governments in the Philippines more transparent?
Step Up Consulting. Bohol, Philippines.

Using a case study approach in three provinces in the Philippines, this project has explored how the sharing of governance information online has impacted on local government systems, and how the information and data has been accessed and used by civil society representatives and intermediary groups.

Links: [Project details](#); [Briefings](#) (x5); [Case study report](#) (forthcoming); [Research poster](#).
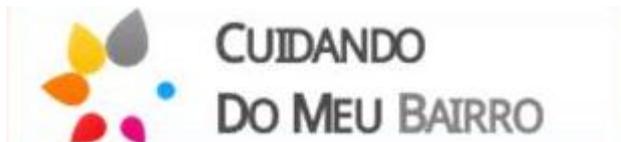
Exploring the impacts of online budget information at the sub-national level in Brazil
Research Group on Public Policies for Information Access (GPoPAI), University of Sao Paulo, Brazil.

Using action-research, survey and interview methods, this project has analyzed the Cuidando do Meu Bairro initiative (Caring for my neighborhood), an online tool visualising budget and spend data for the city of São Paulo on an interactive map. The project has asked whether the Cuidando do Meu Bairro platform allows the public to better understand municipal budgets, how budget information is used by the population, and how public managers respond to citizen use of the data.

Links: Project details; Poster presentation; Case study report (forthcoming); Research poster.

Opening government data by mediation: exploring the roles, practices and strategies of data intermediary organisations in India
HasGeek Media. Bangalore, India.

This study has explored the existence or non-existence of open data intermediary organisations in India, surveying and interviewing NGOs to understand current and possible data access practices.

Links: Project details; Conference paper; Online report (in progress); Case study report (forthcoming); Research poster.

The quality of civic data in India and the implications on the push for Open Data
Transparent Chennai, Institute for Financial Management and Research, India.

The experiences of Transparent Chennai with data at the municipal level in India suggest that the quality of data is unreliable, especially data about the urban poor.This study has examining

different kinds of municipal data through a case study methodology to documents the way data is collected by relevant government agencies and departments, how the data is used in planning and policymaking, the availability of data to the public, the accuracy of the data, and the implications of poor data quality on citizens.

Links: Project details; Poster presentation; Case study report (forthcoming)

How open data could contribute to poverty eradication in Kenya and Uganda through its impacts on resource allocation
Development Initiatives, Kenya, and Development Research and Training, Uganda.

Using case studies from Uganda and Kenya this project has investigated the evolution of the open data movement in the two countries and has assessed the role that the movement plays in the equitable allocation of financial resources for the eradication of extreme and chronic poverty. The project explored the extent to which access to data translates to effective use (or not) particularly in instances where human and financial resources and capacities are limited.

Links: Project details; Case study report; Policy brief; Research poster.

Open government in the Philippines: exploring the role of open government data and the use of new technologies in the delivery of public services
De La Salle University. Manilla, Philippines

This study explores the potentials of open data in two priority development areas in the Philippines: Maternal Health and Childcare (MHCC) and Micro-Small and Medium Scale Enterprises (MSME). Through a case study approach it looks at opportunities where open data techniques can be used to support practices in these areas, exploring the type of data sets, their current use, and how ICT can be used by local stakeholders to better benefit from data availability.

Links: [Project details](#); [Research poster](#); [Project website & YouTube Chanel](#); [Case study report](#); Journal papers (forthcoming); [Research poster](#).

Taking stock of the effectiveness and efficiency of open data initiatives in Sierra Leone.
Society for Democratic Initiatives. Freetown, Sierra Leone.

Sierra Leone, as a transitional country, has instituted several transparency and accountability mechanisms to avoid the re-occurrence of the conflicts witnessed in past decades. This case has assessed the open data landscape of Sierra Leone and has examined how a country in transition can entrench transparency and accountability by instituting, at various levels of government, open government policies that allows for access to information and data and their proactive publication by public institutions. The project explored the challenges that have been faced in the implementation and uptake of existing open data policies, and how ways these challenges may be overcome in future.

Links: [Project details](#); Case study report (forthcoming).

Exploring the open data Initiative of the Ministry of Finance on national budget transparency in Indonesia
Sinergantara

This study has focussed on the development of open data projects to make the Indonesian national budget available, looking in depth at process that occur during the initiation/creation and adoption of the initiative. Using a mixed-methods approach the study has explored factors including: the influence of governance structures on the initiatives development; the supply and demand of budget data; the social and technical intermediaries that support the flow of data to users; the sustainability of the initiative; and how open data eco-systems of standards, technologies and institutions affect the shape the initiative takes.

Links: [Project details](#); [Case study report](#) (forthcoming).

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www.webfoundation.org
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