

Open data, transparency and accountability

Topic guide
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About this Topic Guide

This Topic Guide summarises some of the most rigorous available evidence on the key debates and challenges of open data, transparency and accountability.

GSDRC Topic Guides aim to provide a clear, concise and objective report on findings from rigorous research on critical areas of development policy. Rather than provide policy guidance or recommendations, their purpose is to inform policymakers and practitioners of the key debates and evidence on the topic of focus, to support informed decision-making.

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Cover image: Voters look for their names outside a polling station in Haiti in 2011, in the second round of the presidential elections ([Kendra Helmer/USAID](#)).

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Summary

This topic guide introduces evidence and lessons learned about open data, transparency and accountability in the international development context. It discusses the definitions, theories, challenges and debates presented by the relationship between these concepts, summarises the current state of open data implementation in international development, and highlights lessons and resources for designing and implementing open data programmes.

Open data involves the release of data so that anyone can access, use and share it. The Open Data Charter (2015) describes six principles that aim to make data easier to find, use and combine:

- open by default
- timely and comprehensive
- accessible and usable
- comparable and interoperable
- for improved governance and citizen engagement
- for inclusive development and innovation

One of the main objectives of making data open is to promote transparency.

Transparency is a characteristic of government, companies, organisations and individuals that are open in the clear disclosure of information, rules, plans, processes and actions. Transparency of information is a crucial part of this. Within a development context, transparency and accountability initiatives have emerged over the last decade as a way to address developmental failures and democratic deficits.

There is a strong intersection between open data and transparency as concepts, yet as fields of study and practice, they have remained somewhat separate. This guide draws extensively on analysis and evidence from both sets of literature, beginning by outlining the main concepts and the theories behind the relationships between them.

Data release and transparency are parts of the chain of events leading to accountability. For open data and transparency initiatives to lead to accountability, the required conditions include:

- getting the right data published, which requires an understanding of the politics of data publication
- enabling actors to find, process and use information, and to act on any outputs, which requires an accountability ecosystem that includes equipped and empowered intermediaries
- enabling institutional or social forms of enforceability or citizens' ability to choose better services, which requires infrastructure that can impose sanctions, or sufficient choice or official support for citizens

Programmes intended to increase access to information can be impacted by and can affect inequality. They can also pose risks to privacy and may enable the misuse of data for the exploitation of individuals and markets.

Despite a range of international open data initiatives and pressures, developing countries are lagging behind in the implementation of reforms at government level, in the overall availability of data, and in the use of open data for transparency and accountability. What is more, there are signs that

‘open-washing’ – superficial efforts to publish data without full integration with transparency commitments – may be obscuring backsliding in other aspects of accountability.

The topic guide pulls together lessons and guidance from open data, transparency and accountability work, including an outline of technical and non-technical aspects of implementing a government open data initiative. It also lists further resources, tools and guidance.

1. Key concepts and the state of the evidence

1.1. Open data

Open data involves the release of data so that anyone can access, use and share it. The Open Data Charter (2015) describes six principles that aim to make data easier to find, use and combine:

- open by default
- timely and comprehensive
- accessible and usable
- comparable and interoperable
- for improved governance and citizen engagement
- for inclusive development and innovation

Open by default means that, unless there are good reasons for data to be closed or under restricted sharing arrangements, it should be usable for any legal purpose and accessible to all, and that restrictions on its reuse should be clearly justified.¹ This is usually achieved by:

- making data machine-readable
- publishing it online
- providing a clear statement that gives anyone permission to reuse it

For many open data advocates, the concept is rooted in Sir Tim Berners-Lee's work to build a linked web of data similar to his original World Wide Web.² Sir Tim saw potential in enabling algorithms to pull together data from multiple sources to generate new insights, ideas and services. This narrative is reflected in principles of the open web and the value systems of open source, open knowledge and 'hacker' or 'maker' communities.

The idea of open data has found expression in government commitments to open government and open governance, understood as transformations in the way states engage with citizens. Here, open data is about improved institutional responsiveness and better decision-making by policy-makers and citizens, and is tied to concepts of citizen choice as a mechanism for improving service delivery. (See for example Robinson, Yu, Zeller & Fenton 2009, and Yu & Robinson 2012.)

Open data is primarily a means of enabling transparency, although some argue that it can contribute to economic growth through efficiency and innovation.³

¹ From "Enabling the Data Revolution: An International Open Data Roadmap" at <http://opendatacon.org/report/>

² See Sir Tim's Ted talk (https://www.ted.com/talks/tim_berniers_lee_on_the_next_web) or his academic writing (https://www.researchgate.net/profile/Tim_Berners-Lee).

³ A discussion of the economic potential from open data is outside the scope of this paper, though the most frequently cited literature on this subject are outlined in section 6.2

1.2. Transparency

Transparency is a characteristic of government, companies, organisations and individuals that are open in the clear disclosure of information, rules, plans, processes and actions. Simply making information available is not sufficient to achieve transparency; information needs to be managed and published so it is relevant, accessible, timely and accurate. Kosack and Fung (2014) distinguish four types of transparency:

- the right to government information, embodied in freedom of information laws
- transparency around private organisations and corporate behaviour, often spurred by consumer campaigns
- government regulatory transparency, such as on financial disclosure
- transparency for accountability, which can help improve delivery of public services

Transparency for accountability reflects an evolution of transparency from an end in itself, to a tool for dealing with practical and specific concerns of government performance (Kosack & Fung, 2014).

Within a development context, transparency and accountability initiatives have emerged over the last decade and a half as a way to address developmental failures and democratic deficits. The 2004 World Development Report, *Making Services Work for Poor People*, placed accountability relationships among policy makers, service providers, and clients at the core of development effectiveness (World Bank, 2003).

Traditional supply-side or institutional ways of delivering accountability, such as elections or intra-government controls, have had limited impact, especially where citizens are poor or marginalised. This has led to mechanisms emerging in which citizens demand accountability outside of formal procedures. This emerging field of **social accountability** combines initiatives designed to improve transparency and access to information with other ways of holding institutions to account, including the provision of choice (see Gaventa & McGee, 2013).

1.3. Linking open data and transparency

There is a strong intersection between open data and transparency as *concepts*. As *fields of study and practice* in international development, however, open data and transparency have remained somewhat separate. In international development, open data work is often associated with building statistical capacity, developing ICT infrastructure, enabling civic technology activities, and supporting public and private sector innovation and other digital economy benefits. Transparency, on the other hand, is typically associated with governance reform, anti-corruption and citizen empowerment. The literature and evidence base of each has largely emerged separately. The **open data** field has developed both technical and, increasingly, political insights into the practicalities of getting data released and used. Examples drawn upon in Section 5 include guides by the Open Data Institute;⁴ the Open Data Handbook⁵ by Open Knowledge; and a World Bank toolkit.⁶

However, as open data is a relatively new field, evidence about its effectiveness is underdeveloped.

⁴ <http://theodi.org/guides>

⁵ <http://opendatahandbook.org>

⁶ <http://opendatatoolkit.worldbank.org/en/>

Notable examples of more robust sources of evidence include the Open Data Research Network's evaluations of open data projects,⁷ and a case study mapping project at GovLab (Young & Verhulst, 2016).

The open data literature can also often overlook or underestimate the broader political, social and governance considerations of what it means to be open and transparent, and importantly, what it takes for this to lead to accountability. Its integration of gender issues is also underdeveloped, and some have argued that it lacks conceptual clarity (see Fox, 2014; Carter, 2014; McGee & Edwards, 2016).

The evidence base and literature emerging from work on **transparency** provides a deeper contextualisation of information transparency and its connection to accountability in international development. As a field of practice that has existed for longer, it has a broader pool of examples and empirically evaluated experiments than the open data field. There is therefore a stronger body of evidence on the risks and realities of accountability programme implementation in fragile contexts (Kosack & Fung, 2014; Gaventa & McGee, 2013).

This topic guide discusses connections between open data, transparency and accountability, drawing on analysis and evidence from both the open data and transparency literature. Much can be gained from cross-pollination between these two fields of study, and from sharing good practice and learning between the fields of practice.

1.4. Accountability

Open data and transparency as fields of practice largely share a theory of change when it comes to their assumed impact on accountability.⁸ The transparency literature elaborates this relationship most clearly. Analysts acknowledge that “transparency is necessary but far from sufficient to produce accountability” (Fox, 2007). Rather, transparency is only “one quarter” of the “minimal chain of events” leading to accountability (Peixoto, 2013):

1. Governmental information is disclosed.
2. The disclosed information reaches its intended public.
3. Members of the public can process the disclosed information and react to it.
4. Public officials respond to the public's reaction or are sanctioned by the public through institutional means.

There are limits to information disclosure in this chain. The first relates to *opaque transparency*, defined as the release of information that is not useful, usable or reliable. This does not lead to answerability or the ability to generate insights and demand a response as a result. The second relates to the fact that achieving *hard accountability*, meaning sanctions and consequences, requires a functioning governing regime and civil society with the capacity to encourage public accountability institutions to do their job (Fox, 2007).

⁷ <http://www.opendataresearch.org>

⁸ Accountability exists when citizens are able to demand that the state justifies its actions (“answerability”) and are able to sanction the state if it fails to meet certain standards (“enforceability”).

An alternative interpretation of the chain of events leading to accountability is outlined in literature on social accountability.⁹ This chain is summarised by Kosack and Fung (2013):

1. Service users are provided with information.
2. Service users act on that information by, for example, changing their service provider or engaging in some modified behaviour.
3. Providers see these actions as consequential.
4. Providers respond constructively.

The 2004 World Development Report (World Bank, 2003) describes two pathways through this chain to accountability: a 'short route', where service users engage with the provider directly, by, for example, changing supplier, and a 'long route', where they use their political power, through voting or advocacy, to pressure leaders for improved services.

In a study of empirically evaluated experiments in transparency and accountability, Kosack and Fung (2013) identify where and when social accountability initiatives demonstrated improved service delivery. They found that interventions were successful where either: 1) citizens had options between services; or 2) citizens had no options, but public officials were willing to act on their behalf. Mixed results arose where providers faced little competition and were not responsive to pressure.

For open data and transparency initiatives to lead to accountability, therefore, the following conditions are needed:

1. **The right information is published in the right way at the right time.** This requires an understanding of the politics of data publication.
2. **Societal actors are able to find, access and use this data.** Enabling actors to find and use information, and to share ideas generated or use them to engage with services, requires an accountability ecosystem that includes equipped and empowered intermediaries.
3. **There is space to generate and share insights, and demand a response.**
4. **Functioning response systems are in place, to impose sanctions or introduce other changes; OR citizens have sufficient choice or support from public officials.**

The relationship between information asymmetries and accountability is complex. Barriers can prevent poorer, marginalised or less powerful communities from securing accountability. Meanwhile some have argued that programmes designed to increase information flows can in fact have negative impacts on inequality, technology access and literacy, pose risks to privacy, or lead to the misuse of data for the exploitation of individuals and markets.

⁹ Social accountability is "an approach towards building accountability that relies on civic engagement, i.e. in which it is ordinary citizens and/or civil society organisations who participate directly or indirectly in extracting accountability" (Malena et al. 2004: 3).

2. Getting to accountability: issues and examples

2.1. The politics of data disclosure

A ‘Catch-22’ of open data and transparency for accountability is that the high-value data needed is quite often held by, and must be released by, the same institutions we wish to hold to account. Getting data and information published requires political will, incentives and strategic engagement. While international trends and pressures have helped drive the spread of public pronouncements on open data (see Section 4), implementation of data disclosure is influenced by the political reality on the ground.

The problem is perhaps most plainly articulated by the United States Government’s head of open data, who recently said “right now, it is irrational for almost anybody who works in government to open data... if he fails to open data, worst case, nothing bad happens. But if he does open some data and it has [personal information] his worst case is he’s hauled before a legislative subcommittee, grilled, humiliated and fired” (Wood, 2016).

In understanding the political economy of data release, we can draw on analysis from the transparency field. Lessons from promoting fiscal and budgetary transparency (Khagram et al., 2013) identify three internal competitive dynamics that can drive decisions to disclose information:

- Reform-minded political entrepreneurs can gain support by adopting platforms of transparency and participation after highly publicised scandals involving public resources, or other crises.
- Political elites can use increased transparency as a tool for competition, particularly around elections.
- Political elites can gain from aligning themselves with an important constituency or a well-organised domestic civil society pressing for openness.

These dynamics can be discerned in examples of open data adoption. In Burkina Faso, a fledgling open data initiative was given a strengthened mandate and budget by an interim administration that saw open data as “a vehicle for distinguishing itself from the previous administration – open, transparent, and better at engaging with the public” (Carolan, 2015a). In Slovakia, the decision to reform public contracting was taken in the aftermath of large-scale street demonstrations against the government, described in *The Financial Times* as being motivated by Slovaks’ “discontent with official cronyism and corruption” (Cienski, 2012).

Open contracting in Slovakia

In the wake of street demonstrations, Slovakia introduced a regime requiring that all documents related to public procurement (including receipts and contracts) be published online. Between 2011 and 2014, over 780,000 contracts were published in an open, machine-readable format. Portals with the data attract approximately 54,000 visits a month. Reforms appear to have had an effect on perceptions of corruption, with Slovakia one of the most improved countries on Transparency International's index in the same period, jumping 12 places.

Source: Adapted from Clare et al. (2016)

Further insight can be found in work building international norms around transparency of budgetary information. Analysis by the International Budget Partnership (IBP) (2015) from the fiscal transparency sector highlights two areas where international dynamics can affect domestic political calculations:

- Donors and advocacy coalitions can pressure governments to become more open and inclusive, or the perception that openness and inclusiveness are modern and appropriate practices can press political actors to change.
- Given the strong relationship between increased budget transparency and higher credit ratings and lower borrowing costs, public commitments to openness can be seen as showing international financial markets that governments are serious about their fiscal responsibilities.

One aspect of this is the desire to be seen to do well in international rankings. The Open Data Barometer is particularly potent in this regard, and a target around advancing on this ranking has featured in more than one government policy.¹⁰

Budget disclosure in Indonesia, Nigeria and the Philippines

- An open budget initiative in Indonesia found demand for national budget information from civil society and research organisations, though the level of data use was not yet high (Srimarga, 2014).
- The BudgIT initiative in Nigeria makes budget data simpler and more accessible for citizens, enabling them to demand accountability from public officials (Mejabi et al., 2014).
- An initiative by the Ministry of Local Government in the Philippines required local government to open up financial and procurement information (Cañares et al., 2014).

Finally, open data is also situated within narratives of innovation and economic growth, providing a potential rationale for the adoption of reforms. Of the 20+ government leaders supported by the Open Data Institute to implement reforms in their country, a majority stated that the rationale for undertaking these reforms was to promote the use of data to build new services or intellectual capital and create high-value jobs.¹¹

¹⁰ As seen in confidential internal documents by the author, 2014–2016.

¹¹ In public and private conversations with the author, who led this work from 2014 to 2016.

However, little empirical research has examined the assumption made in many open data programmes that initiatives motivated by objectives other than accountability lead to the publication of datasets that are also valuable for accountability processes.

2.2. Accessing and using data

In most cases, data needs to be processed for it to be useful. It must be processed and used – displayed visually, built into a service or decision-making tool, or used as part of a campaign, for example.

An early article on open data described the assumption that “by making data publicly available in re-usable formats, society would take care of building applications and services” (Huijboom & van den Broek, 2011). This is done by intermediaries (or ‘infomediaries’): people and organisations positioned at some point in a data supply chain who facilitate the use of released information (van Schalkwyk et al., 2015). They can include app developers, journalists, researchers, civic technology activists, and others who can either react to insights or disseminate them so others can do so. (See Carter (2016) for more on infomediaries and accountability.)

However, the assumption that data made available will naturally be put to use may not be correct in the context of international development. Individuals and organisations may not have the necessary skills, motivation, capacity, tools and space to find, process, use and share data and anything that is built from it. One paper calls public interest in the reuse of open public data a “myth” (Hellberg & Hedström, 2015).

Capacity can be limited, to the exclusion of certain groups including women and rural populations. A study of the impact of open data and transparency on poverty eradication in East Africa found that limited technical capacity in data production, analysis and usage, compounded the disparity between literacy levels among men and women (see Lwanga-Ntale et al., 2014 and Neuman, 2016). This is problematic for two reasons. First, it can lead to unequal access and therefore unequal benefit from using the data. Second, there are questions as to whether insights or services created will therefore disproportionately benefit that group or those of a similar demographic. (Section 3 discusses these issues in more detail.)

Some examples, however, show the potential for intermediaries to drive accountability through analysis of data in developing countries, including the example of the 2014 presidential elections in Indonesia.

Elections in Indonesia

Kawal Pemilu (“Guard the Election”) was launched after the 2014 presidential elections in Indonesia as the two contenders traded allegations of vote rigging. A group of technologists and volunteers created a website allowing citizens to compare official vote tallies with the original tabulations from polling stations. The tabulations were made public as part of the Elections General Commission’s commitment to openness, but 700 volunteers had to digitise the forms and make the data more accessible. GovLab’s case study found impact in enabling citizen participation, increasing trust in official tallies and easing the democratic transition.

Source: Graft et al. (2016a).

Intermediaries can also play other important roles beyond data processing. The IBP reviewed 21 case studies and found that civil society played a bigger role in bridging the gap between transparency and accountability than is often recognised. As intermediaries, civil society can make up for the deficiencies of formal oversight actors and improve the accountability system in four main ways (van Zyl, 2013):

- accessing, interpreting and distributing information to multiple stakeholders in useable and accessible formats
- demanding accountability of government directly
- supporting and encouraging formal oversight actors to demand accountability (such as legislatures, auditors, judiciaries)
- supporting and encouraging other actors to demand accountability (such as executive insiders, political parties, donors)

In India, for example, demands by women for accountability in wage payments led to a digital wage payment and tracking system, whereby individual rural women and local organisations could compare biometric-based attendance systems at worksites and online publication of muster rolls and wage records (Rajput and Nair, 2011). A further example of civil society using open data to prompt oversight was the 2009 Afghan elections.

Mapping elections data in Afghanistan

Following the 2009 election in Afghanistan, a map built using released open election data quantified the extent of fraud. It showed that in many polling stations returning a high ballot count a single candidate had received over 90% of the votes. This map informed the decision to force a runoff. The project was repeated in 2014, and included a data exploration tool allowing the identification of anomalies. In one region, results showed Ashraf Ghani winning 100% of 600 ballots in well over 100 stations.

Source: <https://developmentseed.org/projects/afghanistan-elections/>

Engagement with intermediaries and other potential or actual users of information has been highlighted in both the transparency and open data literature as important to the success of initiatives (Davies & Bawa, 2012; Zuiderwijk et al., 2012; Peixoto, 2013; Lindstedt & Naurin, 2010).

In a review of evidence from social accountability initiatives, Fox (2014) found that the most effective projects open up citizen engagement beyond the local arena and increase government's capacity to respond. A study of Spanish and German initiatives found that failing to integrate external data users led to a proliferation of low-value datasets being published (Hunnius et al., 2014). Another found that, even where power relationships between aid accountability seekers and agents are unequal, the fact that a relationship is constructed and maintained at all was key to effectiveness and impact (McGee, 2013).

2.3. Community-generated data

Open government data is not the only source that can be used in attempting to hold institutions to account. Open data technologies, standards and tools have also made it possible for non-state actors to gather, collate and use data that can either fill data gaps or be used to contest official information.

Mapping is one popular area for citizen-generated data collection. Many open mapping projects involve collating information known locally to citizens or communities and digitising and displaying it to fill a data gap or be compared with other sources of information. Examples include a project in Kenya that identified and documented communities under-served by public services, and a project in the DRC that provided evidence of natural resource exploitation.

Open Schools Kenya

Open Schools Kenya built the first map of the informal Kibera settlement in Nairobi. The project mapped more than 350 informal schools serving the settlement, showing for the first time how many students were missing out on the government promise of free primary education. This prompted commitments to build new public schools to better serve the community.

Source: <http://mapkibera.org/about/> and Hagen & Stuart (2015).

Moabi DRC

Moabi DRC is a collaborative mapping initiative that aims to increase transparency and accountability on natural resource issues, especially deforestation and forest degradation, in the Democratic Republic of the Congo. Researchers from University College London worked with civil society organisations to engage indigenous communities in making geo-located maps of important forest resources. Although the local Tswa people are still able to access the forest to hunt and gather food, a forestry company has cut down many of the trees they depend on. The Tswa participants recorded the locations of destroyed resources to add to their map, and took photos to provide evidence of the impact of logging. A group of elders used the application to document that, while there has been some limited consultation with local people, the company has not kept important promises and the community does not benefit from the exploitation taking place in their forest. However, weak accountability mechanisms have meant that the data collection efforts have not yet led to change.

Source: <http://rdc.moabi.org/community-mapping/en>

Another area where community-generated data is frequently used is in gathering alternative datasets to verify or challenge the official results of elections. One example of this is a project that took place alongside the Burkina Faso presidential elections in 2015. As this final case shows, the potential for impact is greatest when multiple sources of data can be combined and compared, especially when data is available in a timely and comparable way.

Open elections in Burkina Faso

In November 2015, for the first election since the ousting of the country's long-time leader, the election commission of Burkina Faso worked with the national open data team to release real-time, verified results district by district, as an open dataset and on an online portal at www.burkina2015.bf. An independent parallel vote count was conducted by Codel, a coalition of civil society organisations, which enabled early results to be quickly checked and verified.

Source: Carolan (2015b)

2.4. Enforcement and sanctions

Transparency and open data cannot compensate for a lack of accountability infrastructure, but well-designed programmes can increase opportunities for disclosure to lead to accountability. Enforcement and sanctions can be delivered through formal political means, or through social accountability.

Political accountability and enforcement

The final step in the chain of accountability is the threat and imposition of sanctions. As Schedler (1999) points out, “political accountability involves more than the generation of data and the interplay of arguments”, also requiring “rewarding good and punishing bad behaviour”.

There are some cases of open data feeding into formal sanction mechanisms, such as the example below from the US. However, these outcomes are only possible where enforcement mechanisms are already strong. There is no evidence that open data strengthens specific accountability mechanisms where these may be lacking. This is especially the case in developing country contexts, as highlighted in the 2004 World Development Report (World Bank 2003), which places accountability relationships among policy makers, service providers, and clients at the core of development effectiveness.

Open data and legal recourse

For over 50 years, residents of the predominantly African-American area of Zanesville, Ohio, had limited access to clean water. After years of legal battles, one key piece of evidence used in court was a map derived from open data from the water company showing significant correlation between the houses occupied by the white residents of Zanesville and the houses hooked up to the city water line. The case went in favour of the African-American plaintiffs, awarding them a \$10.9 million settlement.

Source: Rogawski et al. (2016)

Fox (2014) notes that there are often weaknesses in the state's horizontal accountability institutions, and initiatives aimed at accountability are rarely well coordinated with relevant public sector reforms that encourage government responsiveness – for example, access to information, corruption

investigative bodies, ombudsman etc. This appears to be the case in open data programming, which is rarely aligned with broader governance reforms.

Social accountability

Social accountability relies on civic engagement – on citizens or civil society organisations participating directly or indirectly in extracting accountability (Malena et al., 2004). For social accountability to be effective, citizens need realistic choice between services, public officials need to be willing to act on behalf of citizens, or the information released needs to increase the involvement of communities in the service (Kosack & Fung, 2013).

Intended beneficiaries of support programmes are not always aware of the investments being made in their area. Addressing these information asymmetries by not only publishing data, but also ensuring people who can press for accountability can access it, has the potential to bring about change, as demonstrated in this example from Uganda.

Offline dissemination in education in Uganda

A survey in Uganda found that almost 80% of grants to local governments for primary school materials did not reach their intended beneficiaries. The government started publishing information on such transfers offline to increase access, for example in newspapers and on school bulletin boards. A follow-up survey found that as a result of this campaign, leakage declined from 80% to 20% of total grants (Reinikka & Svensson 2004, in Khagram et al. 2013). Analysis by Paul Hubbard (2007) suggested, however, that success could not be attributed solely to the data disclosure, and that while information did play a critical role, other policies and reforms also helped explain the decline in corruption.

Source: Reinikka & Svensson (2004) in Khagram et al. (2013); Hubbard (2007)

3. Debates

3.1. Privacy

With regard to privacy, there are concerns about the inadvertent publication of personal information and the de-anonymisation of data, whereby individuals can be identified through analysing or combining datasets.

The Open Government Guide, produced by the Open Government Partnership, places the responsibility on governments to be accountable in their handling of citizens' personal information. The right to privacy and the right to information, the two 'information rights', must be balanced so they can work in tandem if the powerful are to be held to account (Open Government Partnership, n.d.).

In developing country contexts, the Open Rights Group, a digital privacy campaigning organisation, found that regulation of privacy was "very patchy", and that penetration of digital technologies meant the risks of privacy violations were "very high". It found that government open data programmes in some African countries had "little consideration of privacy", and in particular worried about the opening of private sector information, including mobile phone analytics (Open Rights Group, 2014).

Privacy considerations can be especially important for women and girls, as both a rights issue and a safety issue. The government of India was recently forced to remove private information, including location, age and contact number, of single women in receipt of government welfare programmes, amid concerns this could lead to harassment (Gowda, 2015).

Privacy advocates fear that, as more datasets become available, de-anonymisation or "jigsaw re-identification" becomes possible, as different data can be pieced together to reveal facts about individuals (O'Hara, 2011). One US researcher who found personal data in publicly available data writes "no matter how carefully one de-identifies information, there remains at least a small risk of reidentification", putting the risk at 0.01–0.25% (Hoffman, 2016). Meanwhile recent research in the EU found that a strong transparency doctrine could make countries more vulnerable to the possible privacy-harming consequences of open data (Jaatinen, 2016).

3.2. Consent

Much existing regulation around data collection assumes that data will be used only for the purposes for which it was collected. However, one of the premises of open data is that data gathered to answer one set of questions might also be useful to a different set of actors with different objectives. For example, satellite data gathered for weather prediction, when opened and mixed with other data, can become part of an advice service to rural farmers on pest control (see Carolan et al., 2015).

However, where data has been collected from people and consent was given at the time of collection only for a particular purpose, using the data for other purposes is ethically questionable. Some experts are concerned that consent for the open use of data is not sought, or that, where it has been sought, the issue has not been fully understood. Survey data is of particular concern, especially when gathered from vulnerable rural populations, a demographic of particular concern for the Sustainable Development Goals.

The idea of consent is central to the idea of privacy (Cate, 2006) and is found in data protection policies that are seen as empowering individuals and allowing them to exercise control (Sinha & Mason, 2016). However, the latter authors argue that problems with implementing the principles of notice and informed consent may require a rethinking of the approach to individual control over personal data. Privacy advocate Simon Davies (2015) describes the principle of consent as having been “corroded over the years through an array of public interest and economically pragmatic carve-outs”, and argues that it is becoming increasingly difficult to implement.

One area where this debate is apparent is the agriculture and nutrition sector. A smallholder rights advocate describes the situation as the “Wild West”, with few regulatory mechanisms in the generation, management, control and exploitation of data, “significant encroachments in property and privacy rights”, unethical practices and “robber baron tactics used in getting control and use of open data generated by communities... who technically and legally should own this data” (Maru, 2015).

3.3. Concerns about exploitation

The ‘Wild West’ analogy above reflects concern, not just about privacy violations, but that open data may enable the exploitation of the people about whom data has been collected. Products, services or insights generated from such data could bring financial or other gains to some people, but not to those from whom it was collected. Individuals could also be exploited directly using data collected from them. The fear of predatory practices by health insurance companies is one potential example.

Shah (2013) writes that, as a consequence of focusing on gaining access to data, some actors “ignore the politics of the data themselves, what the data reveal, or how they are used and for whose interests”. Some take this further, arguing that political parties and business have appropriated the open data movement on “behalf of dominant capitalist interests under the guise of a ‘Transparency Agenda’”, and that “the politics of open data are not simply commonsensical or neutral, but rather are underpinned by political and economic ideology” (Bates, 2013).

On the other hand, some point out that benefits arising from the use of data can reach the people from whom it is derived indirectly. In agriculture, for example, “smallholders typically do not interact with data, particularly in developing countries [yet] whether data are open or not will have an indirect impact on them as the ultimate beneficiaries of research and data on agriculture” (Devare, 2015).

3.4. Impacts on inequality

Work on open data and transparency can sometimes be blind to the political and often contested nature of data, and to programmes’ potential effects on local dynamics.

In a project mapping new technologies emerging in transparency and accountability, Avila et al. (2010) found that initiatives “need to be designed intelligently and with an eye towards local context [and] must be careful to avoid exacerbating societal inequalities by disproportionately empowering elites”. One of the inequalities that open data could widen is the digital divide (Verhulst, 2016). Recent research by MySociety (Rumbull, 2015), a civil technology NGO, suggests the primary beneficiaries of civic technologies built on government data or services are privileged populations.

Gurstein (2011), quoted in McGee and Edwards (2016) reflects from within the open data movement on whether open data is about enabling effective data use for everyone or “empowering the empowered”. He notes the absence of specific efforts to ensure the widest possible availability of the prerequisites for “effective use”, and fears the outcome of open data may be the opposite of that anticipated by its strongest proponents.

Critiques of a perceived blindness to social inequality come from outside and inside the community of actors working on open data. In his analysis of the field, Kitchin (2013) argues that an assumption that open data is “neutral and objective” is implicit in most discussions on the topic. Writing from an information justice perspective, Johnson (2014) contends that there are “problems of justice” resulting from opening data to full public accessibility, stemming from a “failure of the open data movement to understand the constructed nature of data”. He sees value structures as inherent in datasets, which shape analysis and interpretation and work to propagate injustices and reinforce dominant interests. Peter Chow-White (2008) highlights that, despite appearing neutral, when information is networked, such as when databases are compiled and linked, it is not simply reflective of the social world but rather plays “a constitutive role”.

Difficulties are especially evident in relation to gender. Data and metadata may perpetuate gender stereotypes, by, for example, not making provision for non-normative gender identities, capturing only paid occupations or registering males as default property owners (see Buvinic & Levine, 2015; Tichom, 2015).

4. Adoption of open data and transparency

4.1. Extent of adoption of open data in developing countries

Developing countries are lagging behind in the adoption of open data at government level, in the overall availability of data, and in the use of open data for transparency and accountability.

The Open Data Barometer is an annual worldwide survey of government commitments, implementation and impact. The most recent (3rd) edition found open data initiatives in place in 55% of the 92 countries surveyed, and that civil society and technology communities were using government data in 93% of countries, even where data was not yet fully open (World Wide Web Foundation, 2015).

However, the survey shows a marked difference between the availability of data in developed and developing countries. Nearly half of the open datasets found were in 10 OECD countries, and very few were in Africa. In a ranking of countries surveyed, 26 of the top 30 were high-income. Of DFID programme countries,¹² India ranks the highest at 38th, followed by Kenya in 42nd place and Rwanda in 46th.

Regarding the types of data released, datasets related to tackling corruption were the least available. Just 2% of countries published fully open, detailed data on public spending, and 1% published open company data. Further, the survey finds that in many countries political commitments have not translated into systematic plans backed by budget allocations and capacity development.

Research by the Open Data Institute found that many government open data initiatives are fragile. They rely on strong leaders instead of embedded change; they lack feedback loops among users, intermediaries and producers; and their national data infrastructures continue to create barriers and uncertainty (Smith & Carolan, 2016).

There are also some worrying signs that current programmes may be weak or inadequately designed so that they are generating risks or negative consequences:

- The Open Data Barometer found institutional foundations for openness “under threat”, with freedom of information and protection of citizens’ right to privacy declining (World Wide Web Foundation, 2015).
- The Open Rights Group found signs that open data programmes in some developing countries had “little consideration of privacy” (Open Rights Group, 2014).
- MySociety found that the primary beneficiaries of civic technologies built on government data or services are privileged populations (Rumbull, 2015).

¹² <https://www.gov.uk/government/organisations/department-for-international-development/about>

4.2. International drivers of open data and transparency

International drivers of open data broadly align with drivers of transparency, and reflect overlapping trends among donors and other actors. These trends include:

- a drive to fill data gaps and improve statistical capacity in developing countries for improved design and evaluation of government and aid programmes
- a push for reforms aimed at opening up government
- desires for greater transparency, both of aid spending and within particular sectors
- a push for more sophisticated uses of data in decision-making and analytics, and for innovation more broadly
- a push to achieve the Sustainable Development Goals on tackling corruption and tax evasion

The need to fill data gaps was a strong theme in *A World That Counts* (IEAG, 2014), the influential final report of the “data revolution” advisory group established by the UN Secretary-General for the Sustainable Development Goals process. This group resulted in the establishment of the **Global Partnership for Sustainable Development Data** (GPSDD),¹³ a network of governments, NGOs and businesses aiming to improve how data is used in work on sustainable development.

The **Open Government Partnership** (OGP)¹⁴ aims to open government in a range of ways. It has been a strong driver of the adoption of open data initiatives at government level, incentivising governments to work with their civil societies to co-produce national action plans that include commitments to release key datasets. The OGP has been criticised, however – for example for not having “evaluative objectives” in relation to how open data can lead to increased access by citizens (Carter, 2014).

The **International Aid Transparency Initiative** (IATI)¹⁵ aims to make information about how aid is spent more accessible to recipient governments and citizens of both beneficiary and donor countries. It has developed a data publication standard aimed at enabling easier comparability and scrutiny, including by calling for interoperability and machine readability.

The **Extractive Industries Transparency Initiative** (EITI),¹⁶ another voluntary arrangement, incentivises governments and companies to publish information on oil, gas and mining agreements and transactions to a particular standard, to enable scrutiny and identification of financial irregularities.

The **Global Open Data for Agriculture and Nutrition** initiative (GODAN) consists of public, private and third sector actors aiming to increase the availability and use of data in its sector, through advocacy and support to innovation projects.¹⁷

¹³ <http://www.data4sdgs.org>

¹⁴ <http://www.opengovpartnership.org/>

¹⁵ <http://www.aidtransparency.net/about>

¹⁶ <https://eiti.org/>

¹⁷ www.godan.info

In addition, donors and investors are increasingly recognising the value of the data produced through the projects they fund, especially those involving research, and are introducing conditionality in funding agreements so that recipients publish data openly. One example of this is the Gates Foundation's open access policy.¹⁸

A number of other programmes are dedicated to promoting and supporting open data in developing countries. Many of these fall under the umbrella of the **Open Data for Development Network (OD4D)**.¹⁹ This is a funding mechanism hosted by the International Development Research Centre (IDRC). Its grantees support both governments to develop open data initiatives (e.g. at the Open Data Institute)²⁰ and civil society to demand and use data (e.g. at Open Knowledge). The World Bank also supports open data initiatives, and uses an Open Data Readiness Assessment tool²¹ in a large number of countries.

Finally, the newly launched **Open Data Charter** (2015) incentivises national and city governments to make a public commitment to openness. Adoption of the non-binding and voluntary charter requires a high-level public statement of commitment to its principles,²² designating key actions and how they will be delivered. As of August 2016 the charter had no uptake in Africa, though a number of African governments were considering adopting it.²³

4.3. Avoidance of meaningful reforms

While there are many international initiatives driving the open data and transparency agendas, the literature shows that successful implementation requires local ownership and the political will to battle vested interests and change long-held work practices, and to engage meaningfully with users.²⁴

The latest Open Data Barometer report found that 'open-washing' – making weak or superficial efforts to publish data without full integration with broader transparency commitments, analogous to 'green-washing' in the environmental sphere – is "jeopardising progress" (World Wide Web Foundation, 2015). It found that some governments had made public pronouncements of open data commitments but had failed to implement "a culture of openness where citizens are encouraged to ask questions and engage, supported by a legal framework". In fact, it noticed backsliding on freedom of information, transparency and privacy indicators in some countries.

A study of open data reforms found that, in many cases, public bodies avoid publishing data that is politically important or economically valuable, and instead "publish as many data sets as possible in comparatively poor quality" (Hunnius et al., 2014). This, the authors say, has led to data catalogues that are "cluttered with uninteresting and incoherent data which is of little use to the actual users".

¹⁸ <http://www.gatesfoundation.org/How-We-Work/General-Information/Open-Access-Policy>

¹⁹ <http://od4d.net/>

²⁰ <http://theodi.org/global-development-open-data>

²¹ <http://opendatatoolkit.worldbank.org/en/odra.html>

²² The charter sets out six simple principles of open data; see <http://opendatacharter.net/>

²³ Personal communication with the author.

²⁴ See especially: Avila, Feigenblatt, Heacock & Heller (2010); Davies (2012); Attard, Orlandi, Scerri & Auer (2015); Smith, Carolan, Broad & Duhaney (2015); Zuiderwijk, Janssen, Choenni, Meijer & Alibaks (2012).

This is supported by Fox's (2007) observation, based on work in the field of transparency, that those wishing to avoid disclosing information will "express opposition indirectly, by providing less than clear transparency". He refers to "opaque or fuzzy transparency", and the dissemination of information in a way that does not reveal how institutions actually behave or that turns out to be unreliable. This does not aid accountability processes, as "one should not expect answerability from opaque transparency". (See Section 3.1 for a discussion of the political economy of data disclosure.)

Missing data is another challenge. While the aim of data revolution activities is to address this gap (see IEAG, 2014), the absence of quality data, and fear of embarrassment at revealing this absence, further complicates efforts towards data publication and transparency.

However, 'opaque' data publication is a problem, and international programmes play a role in it. Open government reforms are increasingly being used as a metric or milestone for governments that can, in some cases, unlock donor funding. This can create strong incentives for visible outputs such as portals or policies, but is not necessary for the kind of deep reforms and engagement required to release valuable data.

In the push for open data, there is a risk of failing to 'think politically' – to recognise that governance institutions are shaped by power relationships, culture, interests and incentives, not just laws, processes and institutional forms (see Halloran, 2014). Writing about international transparency and accountability initiatives, Guerzovich and Shaw (2013) highlight that when we think politically we see that "the focus must not only be on laws, formal institutional processes, and best practices, but also on the politics of realizing on-the-ground outcomes."

Some open data programmes may involve what Matt Andrews (2013) describes as "isomorphic mimicry" – superficial reforms limited to what is needed for the *appearance* of legitimacy. In the open data sphere, this manifests itself as the building of a portal or publication of an official policy without any change of culture or mindset, or meaningful ongoing data publication.²⁵

There has been limited analysis within the open data field of how programming is operating from this perspective – a gap that needs addressing urgently if lessons from governance reform efforts in other sectors are to be learnt.

²⁵ See, for example, criticism of Kenya's open data process (Brown, 2013).

5. Lessons on programme implementation

This section summarises lessons from evaluations and collections of case studies to help guide the design of open data and transparency programmes. It also points to guidance and tools available for implementing or supporting data publication initiatives, with a full list provided in the next section.

5.1. Contextual success factors for open data and transparency programmes

A major study of **transparency and accountability initiatives'** impact highlights the importance of the context in which they take place (Gaventa & McGee, 2013). The authors find the following explanatory variables.

Supply-side success factors:

- The level of democratisation affects success, with little evidence of impact in non-democracies, but some in emerging democracies and fragile states.
- A political environment that favours a balanced supply- and demand-side approach to accountability is critical to success.
- The broader political economy, prevailing legal framework and incentive structure within which even committed actors and leaders operate matter.

Demand-side success factors:

- Citizens must have the capability to process, analyse and use new information.
- Initiatives have more success when linked to other mobilisation strategies, including those that evoke collective action like electoral pressure or protests.
- Citizens are more likely to engage in monitoring when they are also engaged in formulating policies.

These findings broadly align with those from research by New York University's GovLab (Young & Verhulst, 2016). This looked across 19 case studies of **open data programmes** around the world and identified four conditions that enhanced their impact:

- inclusion of intermediaries and development of partnerships
- development of open data as public infrastructure
- clear policies and political will
- a clear target or problem definition

Effective projects studied by GovLab built partnerships across sectors and occasionally across borders. Two forms of collaboration were found to be particularly important: **partnerships with civil society groups**, for mobilising and educating citizens, and **partnerships with the media**, for analysing and finding meaning in raw open data. The most recent annual report from the International Budget Partnership (2015) also highlights the need for intermediaries to be included in programming, finding

that problems of transparency are shifting from availability of information to opportunities for participation. A DFID programme in Tanzania (the Twaweza project) is an example of this; it gives funding both to support government implementation (via the World Bank) and to a local civil society organisation to make use of information released.²⁶

GovLab found that effective projects grew out of broad and ongoing commitments that formed what could be called an “**open data public infrastructure**”: technical and organisational processes that enable the regular release of potentially impactful data to the public, in some cases taking the form of an “open by default” system of government data generation and release. Kenya’s Open Duka initiative, for example, is improving the country’s internal data capacity, which was deemed part of the problem with achieving impact (Young & Verhulst, 2016). Brazil’s Open Budget Transparency Portal has launched a culture-building campaign of training to support use of its open data (Graft et al., 2016b).

A further determinant of success, according to GovLab’s findings, was the existence of **clear policies** on open data, including well-defined performance metrics – a reminder that technology does not exist in a vacuum. High-level political buy-in is critical to ensure there are consequences for not following rules, and to combat vested interests. These findings align with the Open Data Institute’s findings from its programme supporting governments in developing countries to implement national initiatives. This found widespread uncertainty regarding who ‘owns’ data, how to pay for it and how to collect and share it internally. It concludes that strong open data policies can bring clarity and greater confidence around data publication and use, internally and externally (Smith & Carolan, 2016).

As part of this broader emphasis on infrastructure, it is important to ensure that programmes make data, or at least insights from data, available to those without access to technology. A study of the impact of open data on poverty eradication in East Africa found that offline information for citizens is important, and should not be excluded from the open data agenda (Lwanga-Ntale et al., 2014).

Finally, the GovLab team found that the most successful open data projects identify existing needs and provide new solutions or efficiencies to address them. Singapore’s Dengue Fever Cluster Map is one example that had a clear, tangible benefit: seeking to limit an illness that was widely recognised as a problem. This idea is also reflected in a GODAN discussion paper, which brings together case studies of impact and highlights the need for projects to **start with problems rather than data**.²⁷

²⁶ <https://devtracker.dfid.gov.uk/projects/GB-1-200304>

²⁷ www.godan.info

5.2. Success factors for implementing open data initiatives

Political and legal aspects

As noted above, political will is important to implementation, and any initiative should seek to have a **mandate**, which could be political or legal, formal or informal. Examples of open data **policies** can be accessed via the OGP²⁸ or the World Bank's toolkit.²⁹

The mandate should enable the team overseeing the initiative to **motivate and support** other parts of the entity to publish the relevant data or share it for publication. Attard et al. (2015) found that entities can be discouraged from joining an open government data initiative by a lack of awareness, motivation, capacity, budget provision or technical support.

The **broader policy context** can hinder a mandate's implementation. Areas that may need examining include potentially conflicting regulations, such as on privacy and data protection, existing copyright and licensing frameworks, liability of data providers and – in some cases – regulation around competition (Attard et al., 2015).

It is important to attach an **open licence** to published data. This signals to the user that they have permission to download and use it. This is particularly relevant where the user wishes to analyse or process the data for something that is public facing, or on which they wish to build a business (see Open Data Institute Guidance).³⁰

Finally, the overall **budget** required for an initiative is difficult to assess and varies greatly. The Open Data Institute has developed a guide to planning and costing an open data initiative.³¹

Technical aspects

Initiatives will usually have a **portal** – an online repository into which either a central team or individual data owners upload data. This is not strictly necessary, however, and as long as data is discoverable it can be uploaded via existing services, such as a publisher's main website.

Data should be published to existing **standards**.³² Standards are agreed ways of structuring data that enable users to combine and compare data from different sources.

While there are guidelines³³ that can help with **prioritising** datasets, choosing the data that should be made open is best done by engaging users and allowing them to request datasets they think they can use.³⁴ Many portals accept requests, or provide ways to give feedback on existing data. For

²⁸ www.opengovpartnership.org

²⁹ <http://data.worldbank.org/open-government-data-toolkit>

³⁰ <https://theodi.org/guides/publishers-guide-open-data-licensing>

³¹ <http://theodi.org/guides/how-to-plan-and-budget-an-open-data-initiative>

³² As set out in, for example, principle 4 of the Open Data Charter <http://opendatacharter.net/principles/>

³³ See, for example, the ODI's "How to prioritise open data to drive global development:" <https://theodi.org/guides/prioritise-open-data-to-drive-global-development>

³⁴ The Open Data Handbook sets out guidance <http://opendatahandbook.org/guide/en/how-to-open-up-data/>

example, the Colombian government's open data portal allows users to give datasets 'thumbs up' or 'down'.³⁵

When it comes to the publication of data, **anonymisation** is crucial. The UK Anonymisation Network provides many resources to assist in this.³⁶ See also the Guide to Data Protection by the UK Information Commissioner's Office.³⁷

Attard et al. (2015) summarise the literature on criteria for calculating **data quality** as:

- *usability* – includes aspects like interoperability and discoverability
- *accuracy* – the extent to which metadata correctly describes the respective information
- *completeness* – the number of completed fields in a data/metadata record
- *consistency* – whether field records follow a consistent syntactical format, for example of dates
- *timeliness* – the extent to which the data or metadata is kept up to date
- *accessibility* – how easy it is to discover and understand published information
- *openness* – such as via Tim Berners-Lee's Five Star Scheme for Linked Open Data³⁸

For more details, see the W3C eGov Interest Group steps for publishing open government data.³⁹

Assessing readiness and progress

A number of tools exist for assessing open data readiness and implementation:

- Open Data Certificate – an online tool for checking datasets meet criteria for open data⁴⁰
- Open Data Readiness Assessment – a detailed study developed by the World Bank that is delivered in country⁴¹
- Open Data Barometer and Open Data Census, which provide comparable rankings⁴²
- The Open Data Institute's Pathway tool, which allows institutions to self-assess their progress towards implementation⁴³

³⁵ <https://datos.gov.co/>

³⁶ <http://ukanon.net/ukan-resources/>

³⁷ <https://ico.org.uk/for-organisations/guide-to-data-protection/anonymisation/>

³⁸ <http://5stardata.info/en/>

³⁹ <https://www.w3.org/TR/gov-data/>

⁴⁰ <https://certificates.theodi.org/>

⁴¹ <http://opendatatoolkit.worldbank.org/en/odra.html>

⁴² <http://opendatabarometer.org/> and <http://census.okfn.org/>

⁴³ <http://pathway.theodi.org/>

6. Resources, tools and guidance

6.1. Open data reports, videos and guides

- *How to make a business case for open data* (Open Data Institute)
- *How to plan and budget an open data initiative* (Open Data Institute)
- *Open data handbook* (Open Knowledge International)
- *Open government data: The book* (Joshua Tauberer)
- *Open data policy guidelines* (Sunlight Foundation)
- *Guide to data protection* (UK Information Commissioner's Office)
- *Going open: assessing risk* (open data risk assessment tool) (UK Department for Food, Environment and Rural Affairs)
- *Open government data toolkit* (World Bank)
- Open Data Research Network (World Wide Web Foundation and IDRC)
- School of Data
- Open Data Leaders Network (Open Data Institute)
- Video: What is open data? (Open Data Institute)

6.2. Open data beyond accountability

Economic development and the promotion of innovation are often motivators for the adoption of open data initiatives. A number of case studies illustrate these potential impacts:

- a report from McKinsey identifying a potential \$3 trillion a year value in the global economy from open data (Manyika et al., 2013)
- a report by Deloitte on open data's potential for business (Hammell, 2014)
- a report finding a potential additional 0.5% of gross domestic product (GDP) value by opening data (Lateral Economics, 2016)
- the GroenMonitor project, which is protecting crops from pest outbreaks with vegetation maps built on open satellite imagery⁴⁴
- a recent collaboration between public (open) and private data sources, which is helping farmers take precautions to avoid drought damage in Colombia⁴⁵
- Medicines for Malaria, which is showing that sharing data on drug discovery can help in disease control (Scott, 2015)
- how Thomson Reuters, Syngenta and Arup are embedding open principles into their operations to gain competitive advantage (ODI, n.d.a, n.d.b., n.d.c.)

⁴⁴ <http://www.groenmonitor.nl/>

⁴⁵ <http://www.aclimatecolombia.org/>

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Appendix: Definitions

Accountability means ensuring officials in public, private and voluntary sector organisations are answerable for their actions and that there is redress when duties and commitments are not met. An accountability relationship can be thought of as having four stages (adapted from the [Transparency & Accountability Initiative](#)):

- *standard setting*: setting out expected behaviour and judgement criteria
- *investigation*: exploring whether or not the expected standards have been met
- *answerability*: ensuring that the officials being held to account face questions and explain themselves
- *sanction*: ensuring that the officials being held to account are in some way punished for falling below expected standards

Anonymisation is a process that transforms personal identifiable data into non-identifiable (anonymous) data. This requires that identifiers be removed, obscured, aggregated and/or altered in some way. There are two types of identifiers: formal/direct identifiers (such as a data subject's name, address and unique reference number) and complex identifiers, which can in principle include any piece of information (or combination of pieces of information) that could re-identify a person. (Adapted from the UK Anonymisation Network's [glossary of terms](#).)

Data portals and catalogues are 'one-stop-shops' for data consumers that act as either a registry of data sources, providing links, or a single entry point hosting the actual data, where end users can search and access the published data and explore or interact with it in some manner. Various tools are provided on government data portals, such as data format conversion, visualisations, and query endpoints. (Adapted from Attard et al. 2015.)

Intermediary: An open data intermediary is an agent (i) positioned at some point in a data supply chain that incorporates an open dataset or (ii) positioned between two agents in the supply chain, and (iii) facilitates the use of open data that may otherwise not have been the case. (Definition from the [Open Data Research Network](#).)

Interoperability denotes the ability of diverse systems and organisations to work together (interoperate). In the case of open data, it is the ability to interoperate – or intermix – different datasets. Interoperability is important because it allows for different components to work together. This ability to componentise and to 'plug together' components is essential to building large, complex systems. (Adapted from the [Open Data Handbook](#).)

Metadata is data that provides information about other data. It is often structured (e.g. with tagging). It may be embedded within a single file, incorporated in the 'packaging' associated with a group of files, placed in a related external file or in a system external to the digital file to which the digital file or files are linked. (Adapted from US Government Digitization Guidelines).

Open data is publicly available data that can be universally and readily accessed, used and redistributed free of charge. For data to be considered 'open', it must be accessible, which usually means published on the web; available in a machine-readable format; and have a licence that permits anyone to access, use and share it – commercially and non-commercially. (A fuller and more precise definition is maintained by the [Open Definition](#) project.)

Open governance: Governance broadly speaking is the relationship between citizens and their governments, and the processes in which they interact. Opening governance means working towards governance relationships and processes that are transparent, accountable and participatory, and that allow the perspectives, needs and rights of all citizens to be addressed, including those most marginalised by power relations (McGee & Edwards, 2016).

Open government data is a subset of open data, and is data owned or maintained by the government that is made open to the public. Government data might contain multiple datasets, including on budget and spending, population, census or geographical data, and parliamentary minutes. It also includes data that is indirectly 'owned' by public administrations (e.g. through subsidiaries or agencies), such as data related to climate/pollution, public transportation, congestion/traffic, and child care/education. (Adapted from Attard et al., 2015.)

An **open licence** permits users to download and use data for any purpose. Some open licences have caveats, such as requiring attribution. Common open licences include some Creative Commons licences (excluding 'non-commercial' licences) and some governments' own licences, including the UK's [Open Government Licence](#).

Open standards are technical standards made available to the general public that are developed (or approved) and maintained via a collaborative and consensus-driven process. They facilitate interoperability and data exchange among different products or services and are intended for widespread adoption. (Adapted from the [International Telecommunications Union](#); see also the [Open Stand Principles](#).)

Transparency is a characteristic of governments, companies, organisations and individuals that are open in the clear disclosure of information, rules, plans, processes and actions. As a principle, public officials, directors of companies and organisations and board trustees have a duty to act visibly, predictably and understandably to promote participation and accountability. Simply making information available is not sufficient to achieve transparency; rather, information should be managed and published so it is relevant and accessible, timely and accurate. (Adapted from the [Transparency and Accountability Initiative](#).)