

# Potential of open data in sustainable and open governance: A search for imperceptible barriers.

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**Abstract.** Open data has gained its importance in many aspects of developments including research, education, governance and socio-economical developments. This paper presents a study of the open data movement worldwide and its impact particularly on governance and its related areas. The idea of governance is further illustrated to open government and the potential role the open data could play in an open governance model. The key enablers of open government are essentially transparency and accountability. The role of open data is detailed in making open government goals sustainable. That brings up further investigations on the barriers of open data movement and the efforts made by the participant governments worldwide to break those barriers. In this work, it is established that the least focussed barrier is the privacy concerns of open data and very less work have been done by the governments across the globe. However, privacy being a very strong barrier in limiting the movement of data in open data bounds, the analysis presents an argument to consider the need to encourage work that could ease the opening of data.

**Keywords:** Open data, Barriers, Anonymity, Privacy, Confidentiality, Sensitivity, Open government, Open Government Data (OGD), Open Government Partnership (OGP).

## 1 Introduction

### 1.1 Understanding Open data

The definition of open data is very generous in the sense that it allows people to see, use, investigate and share data without any copyright limitation. In simplest terms when the data is disclosed without any limitations in the access and distribution including commercial use then it is called as an open data. However Formal open data definition includes constraint of machine readability of the data in terms of the distribution structure and format. Open data is formally licensed. [1]

## 1.2 Open data movements

In the last few years, open data has gained lots of attention in the context of movements towards openness and transparency, especially for government data. Even private setups feel the need to open data for a variety of reasons for stakeholders, including researchers, citizens, business and auditing officials. Many countries from all over the world has started to realise and publish their government data to the general public. Private organisations too have begun contributing to the open data which leverages the potential users including researchers that get benefited out of it.

In recent years, many open data movements sprung up around the world, with transparency and data reuse as two significant aims. Some critical early landmarks that build the wave are listed as below.

- Public Sector Information (PSI) Directive in 2003 in Europe [2]
- U.S. President's Obama open data initiative in 2009 [3]
- The Open Government Partnership in 2011 [4]
- The government of India in March 2012 has set the Open Government Data (OGD) [4]
- The G8 Open Data Charter in 2013 [6]

## 1.3 Worldwide impact of open data movements

The government bodies have started to recognise the importance of open data movements towards good governance and have shown interest and alignment in approving the need and putting substantial commitments and efforts. US[7], the UK [8] and Canada [2][9] are among the leaders towards these initiatives. The data collected by the government bodies as the part of the functioning of government could give its citizen a clear-cut understanding about the success and failure of not only government as the higher body but also could provide more delicate details of the bottleneck in smooth functioning of government departments. This opened data for researchers of the different functional domain may mean complete scrutiny at each level and might lead to the results that could be an input to good governance [10][11][5].

It not only encourages active citizen contribution towards good governance at a different level but also has the potential to keep the governance transparent. The data-aware citizen has the potential to interpret facts that could drive larger masses to influence the government bodies to align themselves with definite goals and reforms both in functioning and structuring[12].

There is an enormous effort put by governing and non-governing bodies to collect the data. This data usually doesn't go any processing and interpretations other than initially intended for, and then the effort in the collection of the data is detached with the possibility of the harvesting more knowledge out of it [7]. However, there is a considerable population of capable individuals and organisations, which could infer interesting knowledge set out of it to solve the problems they are actively involved and interested. All this could be practically possible if not only the restrictions on the data are removed but also supporting roadmaps are drawn to achieve this goal. Efforts are made in this direction at the level of individual

communities with an intention to allow the scientific data interrogation by anyone interested in speeding up contribution in the domain which is ultimately beneficial to the community and the people of the world.

## **2. Open data and Open Government**

### **2.1 Open data benefits in context of world economy and citizen centric governance**

The open data have a lot of potentials through research and analysis to benefit science, economy, environment and society. Our prime focus of the discussion in this section is to bring forward the potential of the open data to improve citizen lives and society. The citizens are most impacted by the governance. Transparency and accountability is the essential part of a good governance model[22]. More the transparency is maintained in the government policies, more could be the engagement of people for the betterment of the society. Opening policy data, may mean that the public money would be spent transparently and regulatory bodies would be always open to accountability. Public auditing can build the trust of the citizen in the governments which is open for scrutiny if the governance data is open. The citizens have diverse capability and perspective based on their professional backgrounds. The information so provided also passes through various interest groups and sections of people. So, involvement of general public may not only help the policy formations but may also ensure its effective implementation.

Below, we brief, some of the instances that have been beneficial to many nations and its citizen.

- A classical example as reported by David Eaves in the article referred below, the open data allowed the Canadian citizens to gain 83.2 bn of government money that could have been stolen as a fraudulent donations charity in the year 2010. [23]
- A very detailed and sector wise report of market analysis on past economic benefits and the future projected prediction between 2016-2020 of the economic benefits of open data is published for EU 28 [24]. According to it, with the help of open data public administrations were able to forecast the estimated cost savings for the EU 28 in the year 2020 alone is 1.7 billion EUR. This was done by analysing the government expenditures and averaging them for respective countries. [24]
- As per the reports of “European data portal”, the prediction of benefits of some of the sectors in “direct market” in year 2020 is as below:
- Public sector as an open data re-user gains more than 22 bn EUR. Public administration gain forecast is the highest of all sectors of direct market. Agriculture, arts and entertainment sector taken combined, is expected to gain 379 min EURO.
- Forecast of direct open data job is 100,000 EU 28.
- A complete and detailed study of all the identified sectors of direct market and indirect market gain predictions could be found in the report. [24]

- In general, 325 EUR is the benefits, for year 2020 is predicted for direct market only.
- An indirect market benefit example is 5.5% reduction in fatalities on road. [24]
- A notable example of governance transparency and accountability is, “Follow the money” initiative in Nigeria that publishes the spending of government and foreign aid. The citizen from all respect of professional background evaluates the spending to ascertain that the public money is used as intended and promised. [25]
- The Jakarta provisional government has put up efforts to enable public participation in making and implementing public policy for the capital of Indonesia. Because this project was solely intended for the local citizen, the data portal has both pages and the data sets in regional language. The good aspect that keeps the effort progressive and productive is that the internal agencies entrusted for implementing and managing the data and the infrastructure is also responsible for a regular evaluation and facilitation of introspection at its institutional functioning. [25]

Building such an ecosystem not only allows people to evaluate but will also allow citizen to collaborate and participate in governance in similar trends.

## **2.2 How open data can leverage open governance to achieve sustainability?**

In simple terms, the definition of open Government is attributed to the policy wherein the government is open to transparency and scrutiny with high degree of willingness, by citizens. That basically means to bring accountability in government policies, government bodies and public money utilizations.

At one side, this builds up a more democratic culture of participation and questioning by all stakeholders, essentially citizens. A corrupt government may not be willing to such open Government Data policy.

The term Open Government Data (OGD) leads to participation at these levels

1. Participation for political evaluation by opposition, journalist, activists and social workers.
2. Most subtle collaborative participation of communities.
3. Individual researchers, reformers aiming to track the development and progress regarding social development.
4. Commercial entrepreneurs who can reap the benefit of Open Government Participation (OGP) to build services and providing employment to many.[35][36][37]

## **3. Barriers of open data**

In the information age as today, there is a great possibility to reap the benefits from the huge amount of data captured every day. A number of barriers are identified in reputed government surveys research bodies. The list of such barriers keep on changing in different sources ho ever the theme of top barriers remains the same. Privacy concerns find a place in first or second place in most of the works.[12][17][18][19][20][26][27][28]

### 3.1 Present and past comparison of open data progress

In the last few years, the number of data sets has grown immensely. However, even with such intense focus on opening up the data and despite deliberate efforts to make Governments and organisations understand the benefits of open data, it has been witnessed that there is substantial resistance towards opening the data. This could be validated with a report produced by the World Wide Web Foundation as a collaborative work of the Open Data for Development (OD4D) network and with the support of the Omidyar Network as depicted in the below chart [13].

Parameters	IVth edition (%)	IIIrd ed.(%)	IInd ed.(%)	Ist ed.(%)
Open data	7	10	10	7
Machine readable data	53	55	41	37
Openly licensed data	26	24	14	12

**Table 1.** Open Data Barometer: From Global report fourth edition [16]

The 4<sup>th</sup> edition of Barometer shows the report of 115 participating nations against “The principles of open data Charter”. This table from the fourth annual report indicates fall in open data as depicted by grey colored row. There are numerous reasons for this resistance. One of the leading reasons is the concerns towards preserving anonymity to whom the data belongs. There are various legal implications and regional laws that becomes the barrier in opening the data.

Another interesting clue from “Aligning supply and demand for better Governance” [1] is which is oblivious from the below figure 1 is, that member nations highly embrace the OGP commitment for the technical platform but privacy was the least committed commitment. Three per cent of all respondent countries, only five made a limited commitment to privacy restriction handling. Spain for example committed by promising to anonymise data. Finland aimed to educate public sector with regards to privacy and Canada committed towards strong federal policy.

This observation that “Technical Platform” is most opted commitment with Privacy being the least gives a chance to reason that, the participating countries should shift the solution alignment of privacy barrier from extensive policies refinement to solutions embedded in the technical platform. This way could more easily resolve the privacy barrier as most of the

participant nations have already strong commitment towards the technical platform and investment done accordingly.

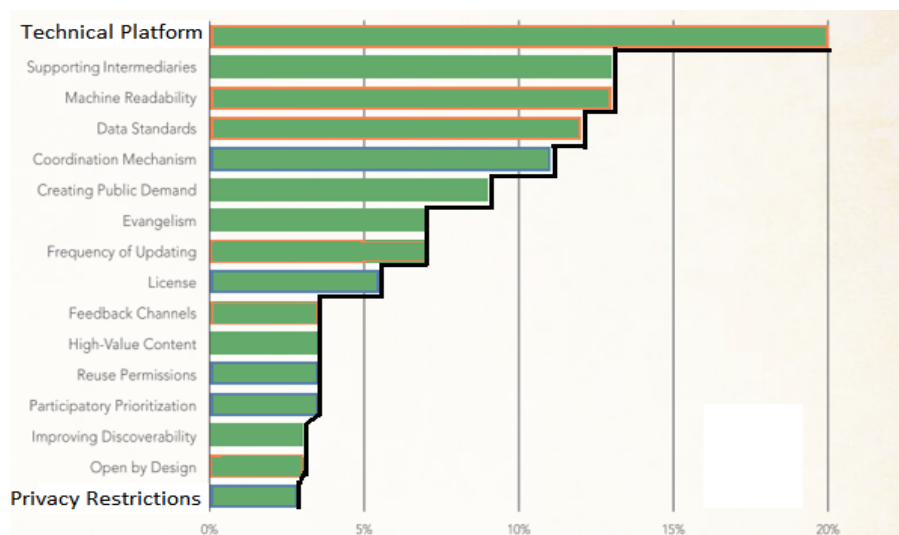


Figure. 1. : Sorted by most frequent tags, OGP commitment [2].

### 3.2 Meaning of Privacy

While we wish to describe the anonymity as a barrier to opening the data, various related terms that are used interchangeably to describe privacy as a barrier in general, needs to be understood, distinctly, in the context of anonymity. These terms in combination describe anonymity along with its nature in the literature discussing anonymity [14][15]. They are

1. Privacy: Privacy means the right of a person is rooted in the law to be protected from any unauthorised intrusion [16].
2. Confidentiality: It means personal information entrusted with a professional or organisation that should not be disclosed on ethical grounds [16].
3. Sensitivity: Sensitive data focuses on the type of data which has known the potential to cause harm to individual, organisation or community. Sensitivity may have both ethical and legal grounds [17].

All these terms have their impact on resistance for the opening of the data [18] [19] [6] [20][21][3] and anonymity

### 3.2 Impact of Privacy violations

Opening of data is often seen as threat to the authorities. Generally the Civil servants are difficult to convince as they fear the critiques for challenging their decision. This is

generally because of lack of proper dialogue and the de-centralized policy to initiate and encourage opening up the information. Moreover license is another technical sub-barrier in opening up of data that might have privacy concern. Heterogeneous nature of licenses across different data sets could mean a strong resistance to bring data under one ambit. [19][26] Another misuse of open data in context of privacy is reported by Solly, Benjamin and others. Their findings suggest that the open land resources in Bangalore were used by the privileged sections of the society in finding technical glitches in documents of the land owners as neither the record of the land was protected for the restricted access nor the Identity of the owners were protected. So, land mafia who have the ability to invest in legal and technical ways, misused the weakness in paper work of the poor land owners resulting in easy grabbing of the lands. This is a typical disadvantage of lack of privacy protection in open data leads to "marginalization of the marginalized". [29]

### **3.3 Anonymity preservation techniques**

Data anonymization is best of all known technique in our study to counter such issues but is still not fool proof and even criticized by researchers[30]. Although there is a big stack of work done in the area of data anonymity and several algorithms have been proposed and published in reputed research journals since 1999 to till date but breaking them is possible and have been demonstrated by the researchers suggesting for the improvements and in the consolidated critical reviews [31][32][33][34]. However, it is guaranteed that the anonymized open data loses its original value for analysis and scrutiny because these algorithms work on suppression and generalization as the key baseline techniques.

## **4. Sustainable and Open Governance**

### **4.1 Role of active civil societies in governance**

Societies are the modern world achievements and have always helped nation at the time of distress. Social movements although are typically different dimension of society that takes a noticeable form at the time of political struggle or when feudal form of governance take charges. The civil societies have always been the key players in during such turmoil and have roles in social movements. But once the peace prevails and people return to their convenient lifestyle, the distortion of the changes begins, sometimes dangerous enough to become a threat to democracy, secularism, constitution and other building blocks of a rightful government. This happens because there is usually a layer of opaqueness between government actions, policies and implementations. Thus due to lack of transparency and accountability the corruption creeps in development of citizen is highly compromised. OGD brings this aspect in control by active participation of all citizens' stakeholders and thus helps in evaluation of better, productive and honest governance model. Thus policies towards OGP and its desired services helps sustainability of an open Government and keep political entities competing for deliverables as they are no more in safe heavens from social scrutiny. The citizens are the biggest gainers.[38][39]

### **4.2 Sustainability in Open Government**

Civil societies since the advent of 18 century played a key role worldwide in formal and organized way to liberate, promote and defend various sections of people with the common interests. These Civil societies have normally been supported by the section of people who share the interest or sometimes also partially aided by governments. However, they, by their fundamental perception are always seen as state independent societies often called NGOs. Apart from such NGOs, unions and professional associates help in the building of common consensus and often resist what is perceived as a threat to the social economic structure. Hailed by distinguished personalities like Karl Marx and even the office bearers of this country, former UN Secretary-General Kofi Aman in the report titled "Strengthening of the United Nation: An agenda for further change" emphasized on the coordination of civil societies and private sectors and advocated on a close coupling of these stake holders.[38][39]

## **5. Conclusion**

Privacy is one of the most leading barriers and the commitment towards privacy concerns as in OGP commitments shows the gap in the understanding of the strong resistance poised by privacy as a barrier.

Individual privacy and the strong protection laws against privacy breach is a serious concern that prevents large volume of data in case the data respondents could be identified. The laws to protect privacy on individual or group of stakeholders provide the protection to people against any misuse of their identity or related information. Weakening of such laws may lead to more data come in the bonds of open data but that would mean the lawful breach of privacy rights of the citizen.

The inverse proportionality in data protection laws and ease of open data is presented in the figure 2.

The data anonymity based algorithms are the most powerful, practically used solutions in privacy preserving frameworks as discussed in section 3.3. But they are criticized for their inability to guarantee data anonymity against their claim. The researchers have done enough to prove that the identity of individual can be recreated using external sources and anonymity algorithm could not provide a fool proof solution towards the anonymity issue in a micro data release. Thus the researches in these directions are still not sufficient enough to help bring more data to open data bounds.



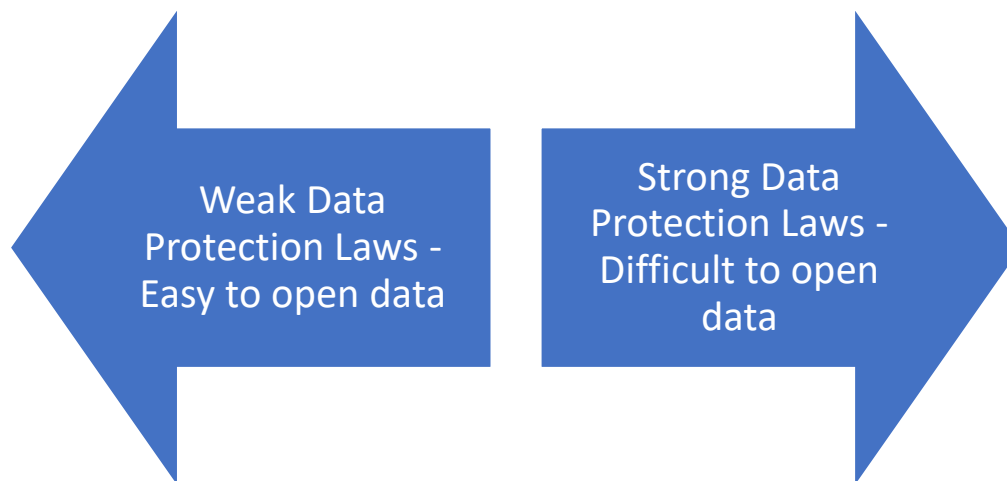


Figure 2. Relationship between data protection laws and ease of opening data

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