ANALYSIS OF BARRIERS TO PUBLISHING AND RE-USE OF OPEN GOVERNMENT DATA

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Abstract

Governments and public organizations hold significant amount of data that, if published under conditions permitting its re-use and in open and machine-readable formats, could be a source of various benefits to individuals, organization, states and wider society. Open Government Data is becoming a widely accepted practice in sharing government data for re-use and in many countries an Open Data initiative has been already launched. Despite this fact the number of truly open datasets still remains low. Stakeholders in the Open Data ecosystem face various barriers when publishing or consuming Open Government Data. The goal of this paper is to analyze what barriers these stakeholders are facing and how the view of the perceived barriers has changed over time. Results of an analysis of several studies and papers dealing with such barrier are presented in this paper and based on these results recommendations for future research are proposed.

1. Introduction

Open Government Data (OGD) is becoming a widely accepted practice in sharing government data for re-use. According to the World Wide Web Foundation (2015) 55% out of 92 countries studied in the third edition of the Open Data Barometer Global Report now have an Open Data initiative in place. Open Data is data "*that can be freely used, re-used and redistributed by anyone – subject only, at most, to the requirement to attribute and sharealike*" (Open Knowledge International, n.d. b). In order to ensure re-usability, Open Data needs to be open both technically and legally. I.e. Open Data needs to be released under an open license permitting its re-use and redistribution and it should be available in an open and machine-readable format, as a complete dataset and preferably for a free download (Open Knowledge International, n.d. a).

Re-use of Open Data could result in various benefits to individuals, organization, states and wider society. According to the World Wide Web Foundation (2015) these benefits include political impacts such as increased transparency and accountability or improved efficiency and effectiveness in the public sector, social impacts such as positive environmental impacts or contribution to the social inclusion, or economic impacts such as contribution to the national economy or support to business and start-ups. Carrara, Chan, Fischer and van Steenbergen (2015a) distinguished between direct and indirect benefits of OGD. Direct benefits represent monetized benefits such as revenues, Gross Value Added, cost savings or number of jobs created. Carrara et al. (2015a) further divided the indirect benefits into economic benefits (e.g. new job potential, knowledge economy growth or

increased public service efficiency), political benefits (e.g. increased public transparency and accountability, civic participation, political awareness or access to information) and social benefits (e.g. social inclusion and empowerment or support to decision-making). Open Data could lower barriers to access to information and therefore it is seen as one of the enablers of the Open Government movement (Bauer, & Kaltenböck, 2012).

Despite the number of Open Data initiatives and policies, global availability of government data that fully meets the Open Data definition remains low (World Wide Web Foundation, 2015). For example assessment of the Open Data maturity in Europe 2016 revealed that only 52% of the countries provided more than 90% of the published datasets in machine-readable formats (Carrara, Nieuwenhuis, & Vollers, 2016). However publishing and re-use of OGD is not just a technical issue and both providers and consumers of OGD still face variety of challenges and barriers (Berends, Carrara, & Vollers, 2017).

The goal of this paper is to analyze what barriers to publishing and re-use of Open Government Data stakeholders in the Open Data ecosystem are facing and how the view of the perceived barriers has changed over time. In order to meet this goal several papers and studies aimed at identification of these barriers published between 2011 and 2017 were analyzed. Results and discussion thereof are presented in this paper. Contribution of this paper therefore lies not in the identification of new barriers to the OGD publishing or re-use but rather in the discussion resulting in the recommendations for future research.

The remainder of this paper is structured as follows. In the following section research approach is explained. Results of the analysis are presented in the next section which is followed with a discussion of the results. Conclusions and recommendations for future research are summarized at the end of the paper.

2. Research approach

The idea of sharing data held by public organizations for re-use is not completely new and it is not entirely related to the OGD initiatives. For example in Europe the Directive 2003/98/EC on the re-use of public sector information (PSI Directive) was adopted in 2003 (European Commission, 2003). However OGD started to gain momentum at the end of the first decade of the new millennium with the start of the Open Government movement (Bauer, & Kaltenböck, 2012). President Obama's Administration issued the Memorandum on Transparency and Open Government in January 2009 (Administration of Barack H. Obama, 2009). In the United Kingdom the national data portal data.gov.uk was launched in January 2010 (National Audit Office, 2012).

As the first step of our research relevant papers and studies were collected. With respect to the fact that the OGD initiatives started to be implemented between the years 2009 and 2010, the search for the relevant papers and studies was narrowed down to works published after 2010. The search was focused on works discussing barriers to publishing or re-reuse of Open Data / Open Government Data. The aim of our research was to study the breadth of the perceived barriers rather that to provide their detailed discussion. Therefore only papers and studies discussing multiple barriers were selected. In total eleven papers and studies published between the years 2011 and 2017 were selected.

The selected papers and studies were analyzed in the following bottom-up approach:

- A list of barriers discussed in the analyzed studies was developed.
- Same or similar barriers discussed in multiple analyzed works were identified and they were labeled with a normalized term. Normalized list of the barriers was compiled by combining barriers labeled with the normalized terms and barriers mentioned only once.
- Because most of the barriers on the normalized list were too fine-grained, closely related barriers were aggregated into more coarse-grained generalized barriers. Barriers discussed in the analyzed works were then mapped to the generalized barriers in order to allow occurrences of the generalized barriers to be analyzed.
- Categories of the generalized barriers were derived by joining the related generalized barriers.

3. Barriers to the publishing and re-use of Open Government Data

As a result of the analysis 50 generalized barriers to the publishing and re-use of OGD were identified that were classified into 10 categories. In total 319 occurrences of the generalized barriers were found in the analyzed papers and studies. Table 1 shows distribution of the occurrences of the generalized barriers across the defined categories of the generalized barriers.

Issues related to the data and metadata availability, accessibility and quality were the most frequently discussed barriers to the publishing and re-use of OGD. This category was followed by the barriers related to legislation, licensing, data protection and privacy. In the analyzed works there was a relatively low number of technology barriers and barriers related to availability of the suitable tools. However it is necessary to note that a different approach to the technology barriers was taken compared to the analyzed works. In some of these works data quality issues or issues related to the data portals were classified as the technical barriers whereas in our research issues related to data portals were considered as the data accessibility barriers. These barriers were classified into a separate category together with the data quality barriers.

Breakdown of the generalized barriers to the publishing and re-use of OGD per category and their occurrences between the years 2011 and 2017 based on the years of publication of the respective works is presented in table 2. Description of the barriers is provided in the following subsections.

Table 1: Occurrences of the generalized barriers per category

Category of the generalized barriers	Occurrences of the generalized barriers
Data and metadata availability, accessibility and quality	89
Legislation, licensing, data and privacy protection	61
Negative and unwanted impacts	27
Open Data stakeholders attitudes and interactions	25
Coordination, organization, processes and management	24
Benefits and positive impacts	24
Resources, costs and financing	22
Leadership, policy and strategy	21
Knowledge, skills and capabilities	17
Technology and tools	9
Total	**319**

3.1. Data and metadata availability, accessibility and quality

According to Carrara et al. (2016, p. 56) "*there is not much Open Data available yet and availability can vary considerably from one data domain to another*". World Wide Web Foundation (2015) in its study pointed out that governments are publishing at least some data online but only a fraction of this data conforms to the definition of Open Data. This finding is in line with the findings of the recent assessment of the Open Data maturity in Europe which showed that that not every country published majority of its data in machine-readable formats (Carrara et al., 2016).

Even if data is published users have difficulties in finding the datasets they need (Janssen, Charalabidis, & Zuiderwijk, 2012; Berends, Carrara, & Vollers, 2017). In some cases data are being sold or fees are being collected for access to data which acts as a barrier to the re-use of data (Janssen et al., 2012; Martin, Foulonneau, Turki, & Ihadjadene, 2013; Ubaldi, 2013). According to Berends et al. (2017) geospatial data is a domain in which data is often charged for as it is a significant source of income of national and regional governments.

Quality of the published data as well as its accompanying metadata is perceived to be low by data users (Berends et al., 2017). Range of the data and metadata quality issues is diverse including missing data or metadata, incompleteness or inaccuracy of data or metadata to name a few examples. Lack of machine-readable formats mentioned above was also classified as one of the data quality issues in our research. Often cited barrier is also heterogeneity of datasets and lack of standardization of data (Janssen et al., 2012; Martin et al., 2013; Ubaldi, 2013; Barry, & Bannister, 2014; Carrara, Fischer, & van Steenbergen, 2015c; Carrara et al., 2016; Berends et al., 2017) and metadata (Janssen et al., 2012; Martin et al., 2013; Berends et al., 2017).

Janssen et al. (2012) identified a missing central data portal as one of the barriers and Ubaldi (2013) discussed establishment of a central data portal as a way to integrate activities of multiple public organizations publishing OGD. In 2015 87% of the European Union member states and European Free Trade Association countries reported to have a national Open Data portal (Carrara et al., 2015c). Even though more than two thirds of these portals provide machine-readable Application Programming Interface (API), the type of the API used by a portal is not always clear (Carrara et al., 2015c).

3.2. Legislation, licensing, data and privacy protection

Not every dataset held by a public organization could be made available as an open dataset for re-use. Some datasets might fall under legislative regimes that could prevent certain data from being published such as the privacy protection or national security legislation (Ubaldi, 2013). According to Carrara, Fischer and van Steenbergen (2015b) anonymization of large datasets is still a challenge. Some also express concerns than anonymized data could be deanonymized under certain circumstances (Barry, & Bannister, 2014).

Another often cited legal barrier to the publishing and re-use of OGD is licensing. Open licenses ensuring rights to re-use data are sometimes missing (see for example Janssen et al., 2012; Carrara, Fischer, Oudkerk, van Steenbergen, & Tinholt, 2015d; or Berends et al., 2017), the terms of use might be restrictive (Janssen et al., 2012; Martin et al., 2013; Ubaldi, 2013) or incompatible (Martin et al., 2013). Not every country has a national regulation related to licensing and in some countries national licenses are not always used (Berends et al., 2017).

Some countries face issues related to the legal framework for publishing OGD. Such a framework may not be developed or if it exists it may not be clear or specific enough (Berends et al., 2017). According to Carrara et al. (2015c) countries with higher OGD maturity should verify that

legislation related to OGD is implemented properly. Ambitious OGD legislation might also take more time to implement as it could face more resistance (Carrara et al., 2016).

3.3. Negative and unwanted impacts

Several authors reported that concerns about negative or unwanted impacts of OGD might represent a barrier. For example according to Martin et al. (2013) civil servants were concerned about possible misinterpretation of the published data and that interpretation of data might put public actions under more challenge from the public. Barry and Bannister (2014) also reported that some civil servants were concerned about negative stories based on the published data and also about publishing data containing errors which, if discovered, could bring negative attention to the publishing organization. Huijboom and Van den Broek (2011) and Janssen et al. (2012) pointed out that increased data availability could contribute to the information overload. Concerns were also expressed that Open Data could contribute to the digital divide because not everybody has the skills, knowledge and capabilities to make use of the available data (Huijboom, & Van den Broek, 2011; Janssen et al., 2012; Martin et al., 2013; Barry, & Bannister, 2014).

3.4. Open Data stakeholders attitudes and interactions

Not every public organization is willing to share its data (Carrara et al. 2015c). Publishing OGD often requires a change to the mindset of the civil servants or a change to the organizational culture of public organizations which is reported to be closed, defensive or risk-averse (Huijboom, & Van den Broek, 2011; Janssen et al., 2012; Martin et al., 2013; Barry, & Bannister, 2014; Carrara et al., 2015b). However it is not only the willingness of the public organizations that might act as a barrier to reaping of the perceived benefits of OGD. For example Janssen at al. (2012) pointed out that incentives for users might be missing or that users may have no time to use data. Carrara et al. (2015c) argue that prioritization of datasets for publishing could benefit from more intense involvement of the demand side. Ubaldi (2013) argued that in order to be able to reap the potential benefits of OGD an ecosystem of key actors need to be created. However Berends et al. (2017) pointed out that providers of OGD, users and policy makers might not know each other.

3.5. Coordination, organization, processes and management

Publishing and re-use of OGD also brings organizational and managerial issues. Coordination between public sector organizations or departments is needed to support the OGD publishing, but sometimes there is a perceived lack of culture that would be open towards sharing and collaboration between departments (Carrara et al., 2015c). Cooperation is also needed between national and regional public organizations (Carrara et al., 2016). Publishing and re-use of OGD also requires appropriate processes, organizational structures and data governance practices that are not always in place (Ubaldi 2013; Carrara et al., 2015d; Berends et al., 2017). Janssen et al. (2012) also pointed out that some users were frustrated at existence of too many OGD initiatives.

3.6. Benefits and positive impacts

Potential users are not always aware of the available open datasets and of the potential benefits of OGD (Janssen et al., 2012; Ubaldi, 2013), but there are only few awareness raising activities (Carrara et al., 2015c, Carrara et al., 2016; Berends et al., 2017). Awareness of politicians and public sector representatives of the OGD benefits is also low or lacking (Barry, & Bannister, 2014; Berends et al., 2017). Besides the lack of awareness the economic benefits of OGD were seen as uncertain (Huijboom, & Van den Broek, 2011) or unclear in general which was reported to

complicate development of a business case for OGD (Janssen et al., 2012; Ubaldi, 2013; Barry, & Bannister, 2014; Berends et al., 2017). One of the findings of the assessment of the Open Data maturity in Europe 2015 was that "*long running Open Data initiatives check neither effectiveness nor impact*" (Carrara et al., 2015c).

3.7. Resources, costs and financing

As it was discussed in the section 3.1 selling data or collection of fees represents a barrier to the re-use of government data. However for some public organization switching to providing data free of charge would result in a loss of revenue (Janssen et al., 2012; Ubaldi, 2013; Conradie, & Choenni, 2014; Barry, & Bannister, 2014; Carrara et al., 2015c; Carrara et al., 2016; Berends et al., 2017). Therefore new funding models need to be applied in certain situations in order to allow publishing government data for free.

Publishing of OGD requires resources and funding, however this funding might be sometimes lacking (Janssen et al., 2012; Berends et al., 2017). Berends et al. (2017) also argued that sustainable funding of the OGD initiatives need to be ensured and that if the priorities change in the future OGD portals might be threatened with a lack of funding to maintain their operation.

3.8. Leadership, policy and strategy

According to Ubaldi (2013) few countries had a long-term OGD policy or strategy. Other authors reported that the barrier does not lie in the complete lack of some OGD policy but rather in inconsistencies between multiple existing policies (Huijboom, & Van den Broek, 2011; Janssen et al., 2012; Martin et al., 2013; Barry, & Bannister, 2014; Berends et al., 2017). Unclear responsibilities for the OGD policy (Martin et al., 2013) or varying interests of those involved in its development (Berends et al., 2017) might contribute to this barrier. In public sector OGD publishing requires political support, but in some countries OGD is not a political priority (Conradie, & Choenni, 2014; Carrara et al., 2015c; Carrara et al., 2016; Berends et al., 2017).

3.9. Knowledge, skills and capabilities

Lack of knowledge, skills and capabilities could be a barrier to the OGD publishing and re-use (Janssen et al., 2012; Martin et al., 2013; Ubaldi, 2013; Barry, & Bannister, 2014; Carrara et al., 2015c; Carrara et al., 2015d; Carrara et al., 2016; Berends et al., 2017). According to Carrara et al. (2015b) variety of skills is needed in order to be able to make use of OGD that include technical skills, statistical skills, analytical skills, communication skills, business insight and domain knowledge. On the OGD publisher side lack of the technical skills was mentioned (see for example Barry, & Bannister, 2014, or Carrara et al., 2016). Ubaldi (2013) specifically mentioned the lack of skills for working with Linked Data.

3.10. Technology and tools

According to Huijboom and Van den Broek (2011) limited capacity of existing networks was perceived as a barrier to the OGD publishing and re-use. Janssen et al. (2012) discussed the perceived lack of tools and support and they also pointed out that the OGD publishing might be complicated by legacy applications or fragmented applications. According to Ubaldi (2013) the OGD publishing requires improvements to the technology infrastructure and integration of OGD tools and applications.

Table 2: Barriers to the publishing and re-use of Open Government Data

Barriers	2011	2012	2013	2014	2015	2016	2017
Data and metadata availability, accessibility and quality							
Data and metadata quality issues	X[a]	X[b]	X[c,d]	X[e]	X[g,h,i]	X[j]	X[k]
Data availability issues		X[b]	X[c]		X[g,h]	X[j]	X[k]
Data accessibility issues		X[b]	X[c,d]				X[k]
Data is not always available for free		X[b]	X[c,d]				X[k]
Data portal API and harvesting issues			X[c]		X[h]		
Complexity of datasets or data formats	X[a]	X[b]					X[k]
No central data portal		X[b]	X[d]				
Legislation, licensing, data and privacy protection							
Data protection, privacy or security constraints and data anonymization issues	X[a]	X[b]	X[c,d]	X[e]	X[g,h]	X[j]	X[k]
Data licensing issues and terms of use restricting re-use		X[b]	X[c,d]	X[e]	X[h,i]	X[j]	X[k]
Issues related to legislation and legal framework			X[c,d]	X[e]	X[h]	X[j]	X[k]
Concerns about possible legal disputes and liability		X[b]		X[e]			
Unclear ownership of data			X[d]	X[f]			
Existing contracts or already engaged rights hindering publishing or re-use		X[b]	X[c]				
Compliance issues other than data or privacy protection			X[d]				
Negative and unwanted impacts							
Abuse, misuse or misinterpretation of data		X[b]	X[c]	X[e,f]			
Open Data could contribute to the digital divide	X[a]	X[b]	X[c,d]	X[e]			
Unwanted consequences and other negative impacts of Open Data		X[b]	X[c]	X[e]			
Concerns about public scrutiny and negative impacts if improper or low quality data is published		X[b]	X[c]	X[e]			
Transparency might sometimes undermine trust rather than help to build it		X[b]		X[e]			
Information overload	X[a]	X[b]					
Open Data might negatively impact markets			X[c]				
Open Data stakeholders attitudes and interactions							
Lack of willingness to share data and a need to change the cultural mindset	X[a]	X[b]	X[c]	X[e]	X[g,h]		
Low interest of users		X[b]			X[h]		
User input and feedback issues		X[b]					X[k]
Low attention is paid to the demand and user needs		X[b]	X[d]				
Lack of dialogue between Open Data stakeholders			X[c,d]				
Difficulties in building the Open Data ecosystem			X[d]				X[k]

Barriers	2011	2012	2013	2014	2015	2016	2017
Coordination, organization, processes and management							
Challenges arising from the coordination and collaboration among public organizations or departments			X[c,d]		X[g,h]	X[j]	X[k]
Data governance and management issues			X[d]		X[i]		X[k]
Lack of appropriate organizational structures, roles and responsibilities			X[d]		X[i]		X[k]
Lack of appropriate processes		X[b]	X[d]				X[k]
Too many Open Data initiatives		X[b]					
Benefits and positive impacts							
Low stakeholders' awareness of the Open Data availability, benefits and value		X[b]	X[c,d]	X[e]	X[h,i]	X[j]	X[k]
Unclear benefits of Open Data and difficulties related to its measurement	X[a]	X[b]	X[c,d]	X[e]			X[k]
Effectiveness or impact of Open Data initiatives is not measured					X[h]		
Low public sector's awareness of the benefits of crowd sourcing			X[d]				
Resources, costs and financing							
Loss of revenue when providing data for free resulting in a need to change the funding model	X[a]	X[b]	X[c,d]	X[e,f]	X[h]	X[j]	X[k]
Costs of Open Data initiatives		X[b]	X[c,d]	X[e]	X[h]		
Lacking or not sustainable funding		X[b]	X[c]				X[k]
Lack of non-financial resources				X[e]	X[h]		
Leadership, policy and strategy							
Open Data policy issues	X[a]	X[b]	X[c,d]	X[e]	X[h]	X[j]	X[k]
Publishing Open Data is not a priority				X[f]	X[h]	X[j]	X[k]
Lack of Open Data strategy			X[d]	X[e]			
Lack of leadership				X[e]			
Knowledge, skills and capabilities							
Lack of knowledge, skills or capabilities to use data		X[b]	X[c,d]		X[h,i]		X[k]
Lack of knowledge, skills or capabilities to publish data			X[d]	X[e]		X[j]	X[k]
Technology and tools							
Technology issues	X[a]	X[b]	X[d]				
Users lack appropriate tools		X[b]					
Support for data publishers might not be always available		X[b]					
Support for users might not be always available		X[b]					

[a](Huijboom, & Van den Broek, 2011). [b](Janssen et al., 2012). [c](Martin et al., 2013). [d](Ubaldi, 2013). [e](Barry, & Bannister, 2014). [f](Conradie, & Choenni, 2014). [g](Carrara et al., 2015b). [h](Carrara et al., 2015c). [i](Carrara et al., 2015d). [j](Carrara et al., 2016). [k](Berends et al., 2017).

4. Discussion

OGD has received a lot of attention from governments which resulted in OGD initiatives being established in many countries across the globe (World Wide Web Foundation, 2015). Despite the

efforts many barriers to the publishing and re-use of OGD still prevail. Our research shows that the range of these barriers is quite diverse and that the barriers lie on both the side of data publishers and the side of data consumers. However the barriers faced by the stakeholders in the OGD ecosystem are not only diverse but, as Janssen et al. (2012) pointed out, they are often interrelated. For example low quality of metadata hinders discoverability of data (Berends et al., 2017). Perceived lack of clarity of the benefits of OGD could negatively impact willingness to share data and to re-use it. Overcoming the barriers therefore needs both in-depth study of the individual barriers in order to find solutions that would fit to the problems in particular and the holistic approach that would cover diversity of barriers and relationships between them in order to provide comprehensive recommendations to the stakeholders.

A set of Best practices for Sharing Public Sector Information (Share-PSI 2.0, 2016a) was developed in order to help organizations and individuals with this task. This set of best practices is accompanied with the Data on the Web Best Practices that was adopted as a W3C Recommendation in January 2017 (Lóscio, Burle, & Calegari, 2017). National and local governments as well as international organizations and institutions are developing their guidelines for publishing and re-use of PSI and OGD (Share-PSI 2.0, 2016b). Future research should study how these best practices and guidelines are being implemented and how they contribute to overcoming the barriers to the publishing and re-use of OGD.

Some of the generalized barriers analyzed in our research has been present for the whole or most of the studied period. Future research on the following topics therefore seems necessary:

- Quality of OGD including the quality of the related metadata,
- Availability of OGD,
- Data protection, privacy or security constraints and data anonymization in relationship to the publishing and re-use of OGD,
- OGD licensing,
- Legislation and legal frameworks for OGD,
- Awareness of the stakeholders in the OGD ecosystem,
- OGD benefits and its measurement,
- Funding models enabling sustainable OGD provision,
- OGD policies and strategies.

Concerns about the possible negative or unwanted impacts of OGD were discussed by several authors of works published up to 2014. In the works published later these concerns were not explicitly mentioned. Therefore future research should study whether these issues are still perceived as barriers to the OGD publishing and re-use. The same applies to the barriers related to technology and tools.

On the other hand low political priority of the OGD initiatives was reported for four consequent year starting from the year 2014. Future research should therefore study whether OGD initiatives will face lacking or diminishing political priority in the near future.

5. Conclusions

Re-use of data held be governments and public organizations could result in political, social and economic benefits. In order to make their data accessible and re-usable, many governments across the globe has launched their OGD initiatives (World Wide Web Foundation, 2015). Even though these initiatives have been gaining momentum for the last couple of years, stakeholders in the OGD ecosystem still face various barriers when publishing and re-using OGD.

In this paper results of an analysis of eleven papers and studies discussing barriers to the publishing and re-use of OGD that were published between the years 2011 and 2017 were presented. In total 50 generalized barriers were derived from the barriers discussed by the authors of the analyzed works that were subsequently classified into 10 categories.

Stakeholders in the OGD ecosystem face diverse range of barriers and, as Janssen et al. (2012) pointed out, these barriers are often interrelated which makes publishing and re-use of OGD a complex problem. Our research shows that some of the barriers such as the barriers related to low or insufficient availability, accessibility and quality of data and metadata or the barriers related to licensing and legislation, as well as many others, were discussed by multiple authors throughout the whole studied period. This might indicate that despite the efforts to support the OGD initiatives there are many prevailing challenges in the domain of the OGD publishing and re-use.

Discussion of the results of our research indicated several topics for future research. These topics include studying how the best practices and guidelines for OGD publishing and re-use are being implemented and how they contribute to overcoming the barriers. Future research seems to be necessary in domains where the barriers have been prevailing for many years such as the quality and availability of OGD, data protection, privacy and security, OGD licensing, legislation and legal frameworks, awareness of the OGD stakeholders, OGD benefits and its measurement, funding models of the OGD provision or the OGD policies and strategies. Future research should also study whether all of the barriers analyzed in our research are still relevant. Repeated occurrence of the perceived low political support to OGD in some of the recent studies could also be a topic of future research.

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