Measuring Data Demand Within the Public Sector

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This discussion paper "Measuring data demand within the public sector" is the first of two papers aimed at fostering the engagement of data.europa.eu re-users from the public sector. It sets the stage for a one-year running campaign featuring several blog posts to be published on data.europa.eu and a data.europa academy webinar on data demand and re-use in the public sector.

The second paper will focus on fostering data-driven value creation in the public sector. It will incorporate the insights from the running campaign, draw conclusions and provide policy recommendations on how data.europa.eu can enable and stimulate data re-use by public institutions across Europe.

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Executive summary

What are the needs of open data re-users from public sector institutions in Europe? This question is critical to facilitate the publication of open data and support to re-users from EU institutions and public authorities in Member States in line with their needs for policymaking, service provision and organisational management. To what extent is this question asked in open data policymaking across Europe? And how?

This discussion paper provides an overview of the state-of-the-art of existing approaches and indicators in the European open data landscape to assess public institutions' needs as data re-users. This overview serves as a basis to drive a discussion with public sector stakeholders on suitable methods and indicators to measure public institutions' data demand to foster demand-driven data publication and support on data.europa.eu, the official portal for European data.

The undertaken literature review and the analysis of international measurement frameworks show feeble evidence of existing approaches and indicators developed by EU institutions and Member States to assess public institutions' open data demand. The results of this discussion paper raise the following questions to be discussed with stakeholders to further develop demand-driven data publication and support to public sector re-users.

1. Why is it important to measure public institutions' data demand?
2. What are suitable engagement activities for public sector re-users?
3. What is needed to evolve demand measurement from an occasional to a structural activity?
4. How can automated metrics be leveraged to measure the data demand by public institutions?
5. To what extent can existing international indicators be re-used and complemented to measure public institutions' data demand?
6. How can data providers in EU institutions and Member States be supported in adopting a demand-driven approach towards the publication of open data for public sector purposes?

1 The under-recognised role of public institutions[1] as re-users of European open data

1.1 The problem: the missed potential of data re-use in the public sector

Open data has been at the centre of European digital policy for at least 10 years, culminating in the revision of the Public Sector Information Directive in 2013[2] and transformation into the Open Data Directive[3] in 2019. Initially motivated by the search for more public sector transparency and accountability, open data policy has made real advances since it became clear that there was a significant potential for economic value creation. The rationale is that the private sector will build services based on government data that will provide a higher return (in terms of public value and revenue generation) than the amount the public sector can obtain by selling the data it controls. One of the first studies in this field, the 2006 MEPSIR study, presents the open data market size (EUR 48 billion) as the headline indicator to assess the impact of open data. The importance of economic value creation is underlined by consecutive policies and reports.[4] In her 2011 speech presenting the open data package, commissioner Neelie Kroes, one of the driving forces behind the initiative, highlights "the opportunities of businesses, journalists, academics and all citizens, in fact, to generate new and rich content." Government is not mentioned. The commissioner exemplifies the argument through anecdotes such as "When the Danish Enterprise and Construction Authority (DECA) lowered fees, the number of users of its information went up by ten thousand percent (10,000%)! This generated four times the tax revenue lost from fees charged for data."[5] Two European Data Portal reports published in 2020 build on this logic by focusing on how companies transform open data into economic and social values and by defining open data benefits in terms of direct monetised benefits that are realised in market transactions (e.g. revenues and Gross Value Added (GVA)) and indirect ones (e.g. new goods and services, time savings for users of applications using open data).[6] By 2019, the open data market value had increased to EUR 184 billion, up from EUR 48 billion in 2006.[7]

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[1] In this paper, public institutions are defined as public sector bodies in the sense of the EU Open Data Directive: "the State, regional or local authorities, bodies governed by public law or associations formed by one or more such authorities or one or more such bodies governed by public law." European Commission, "Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on Open Data and the Re-Use of Public Sector Information," *Official Journal of the European Union*, 2019. https://eur-lex.europa.eu/eli/dir/2019/1024/oj

[2] European Commission, "Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information Text with EEA relevance," *Official Journal of the European Union*, 2013. https://eur-lex.europa.eu/eli/dir/2013/37/oj

[3] European Commission, "Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on Open Data and the Re-Use of Public Sector Information," *Official Journal of the European Union*, 2019. https://eur-lex.europa.eu/eli/dir/2019/1024/oj

[4] Makx Dekkers et al., "Measuring European Public Sector Information Resources," 2006. http://opendatatales.com/wp-content/uploads/2019/02/Dekkers-et-al.-2006-Measuring-European-Public-Sector-Information-Resou.pdf

[5] European Commission, "Neelie Kroes Vice-President of the European Commission responsible for the Digital Agenda Data is the new gold Opening Remarks, Press Conference on Open Data Strategy Brussels," 2011. https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_11_872.

[6] Jorn Berends et al., "Reusing Open Data. A Study on Companies Transforming Open Data to Economic and Societal Value," *Publications Office of the European Union,* 2020. https://doi.org/10.2830/876679; Wendy Carrara et al., "Creating Value through Open Data - Study on the Impact of Re-Use of Public Data Resources," *Publications Office of the European Union*, 2020. https://doi.org/10.2759/328101

[7] Esther Huyer et al., "The Economic Impact of Open Data - Opportunities for Value Creation in Europe," *Publications Office of the European Union*, 2020. https://doi.org/10.2830/63132

As outlined above, the traditional focus sees the public sector as the data provider, and the private sector as the re-user. The tacit assumptions behind this are that it is mainly the private sector that can create value out of data, and that data flows freely between different parts of the public sector. Both assumptions are wrong.

Data re-use is an immense resource for the public sector. Public institutions around the world are increasingly exploring how to foster a data-driven public sector that recognises data as an integral asset for policymaking, service delivery, organisational management and public innovation.[8] The OECD has identified three areas in which data-re-use can enhance the effectiveness of policymakers and public officials across policy areas and government levels.[9]

The first is that of *anticipatory governance*, which refers to systematic efforts by governments to consider the future in order to inform policy decisions today. Data can be used to predict trends and patterns in order to mitigate emerging risks and respond to developing crises. For instance, Eurostat has created the interactive European Statistical Recovery Dashboard, bringing together monthly and quarterly indicators from a number of statistical areas relevant for tracking the economic and social recovery from the COVID-19 pandemic, across countries and time as well as a monthly comprehensive analysis.[10] An example at the Member State level is the French region of "Centre-Val de Loire", which re-uses data from the National Public Health Agency (Santé Publique France) to create a visualisation of the state and evolution of COVID-19 vaccinations in France.[11]

A second area of opportunity is that of *design and delivery* of policy and services, where data provide important ways of understanding problems, engaging the public and providing access to insights for improving public services that meet user needs, while creating the conditions for robust, evidence-based policy making. An example can be found in the Baltic Sea Region, where cross-border use of open government data has a high potential for applications in the area of welfare services.[12] It is the citizen as a service user that benefits from an integrated service as a result of a better collaboration between the different public organisations involved in the welfare situation.

Thirdly, data can be leveraged for *performance management* in terms of greater public sector productivity, more efficient use of resources and better evaluation of policies and impact. For instance, the evaluation of agricultural policy is facilitated by the European Commission's Agri-food Data portal, which draws on data from multiple European institutions for the calculation of key indicators and drafting of analytical reports.[13] In Denmark, the re-use of open address data led to improved

[8] Charlotte van Ooijen, Barbara Ubaldi and Benjamin Welby, "A Data-Driven Public Sector: Enabling the Strategic Use of Data for Productive, Inclusive and Trustworthy Governance," *OECD Working Papers on Public Governance*, 2019. https://dx.doi.org/10.1787/09ab162c-en; Gianluca Misuraca, Egidijus Barcevičius and Cristiano Codagnone, "Exploring Digital Government Transformation in the EU - Understanding Public Sector Innovation in a Data-Driven Society," *Publications Office of the European Union*, 2020. https://econpapers.repec.org/RePEc:ipt:iptwpa:jrc121548

[9] Van Ooijen et al., Ibid.

[10] Eurostat, "European Statistical Recovery Dashboard," *European Commission,* 2022, https://ec.europa.eu/eurostat/cache/recovery-dashboard

[11] French Republic, "Suivi de La Vaccination Contre La COVID-19," 2021. https://www.data.gouv.fr/fr/reuses/suivi-de-la-vaccination-contre-la-covid-19

[12] Joakim Wernberg, "Towards a Cross-Border Open Data Agenda. A Case for a Macro-Regional Agenda on Open Government Data in the Baltic Sea Region," 2016. http://topofdigital.eu/wp-content/uploads/2015/03/OPEN-DATA-2017-WEB-A4_22-12.pdf

[13] Directorate-General for Agriculture and Rural Development, "Agri-food Data Portal," *European Commission*, 2022, https://agridata.ec.europa.eu/extensions/DataPortal/home.html

government back-end capabilities, more efficient service delivery and improved response accuracy for the emergency services.[14]

The inspiring examples of data re-use within the public sector are numerous and the potential benefits of strengthening public institutions' capacities for anticipatory governance, design and delivery, and performance management through the increased sharing and re-use of data are undeniable.[15] Not only can services and policies become more efficient, thereby affecting the public sector's financial bottom line, but they may also become more sustainable, inclusive and trustworthy, thereby directly benefiting citizens and businesses. In order to seize this opportunity, it is necessary to scale up existing efforts beyond organisational and policy boundaries or as the OECD puts it "move from hype to impact."[16] Most evidence on data re-use within the public sector is scattered and of anecdotal nature. Large-scale evidence is scarce and tends to focus on -also highly relevant topics of- government support to data sharing and re-use without measuring the extent to which available public data is actually re-used and what impact is achieved.[17] The 2019 results of the OECD Digital Government Index highlight the absence of formal requirements for single data inventories, data sharing between public institutions and leading roles (e.g. Chief Data Officers), indicating that "governments do not yet perceive data as a foundation for improved policy making, service delivery and ongoing performance management."[18] As a result, data does not flow freely across the public sector. Data silos, not data sharing, is the status quo. The same barriers observed in data sharing between companies, appear in data sharing between public agencies and departments. Companies and public institutions choose to keep the data in house because there are no incentives for data sharing. [19] On the contrary, there is a fear of loss of control over data-driven results, potential revenue losses and violation of data protection regulation, which is accompanied by an unclear picture of the potential gains. On top of these cultural, financial and legal barriers the public sector has to deal with a data skills deficit and issues of data discoverability and interoperability.[20]

1.2 The solution: measure and take into account public institutions' data demand

While open data portals help to overcome such barriers, simply publishing datasets on a data portal will not generate data re-use nor the associated benefits for public sector processes and results. Evidence gathered by several international organisations shows that to generate maximum impact from open data, the publication process as well as the support mechanisms have to be built around

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[14] Esther Huyer and Marit Blank, "High-Value Datasets: Understanding the Perspective of Data Providers. Analytical Report N15," *Publications Office of the European Union*, 2020. https://doi.org/10.2830/363773

[15] For more examples, see OECD, "The Path to Becoming a Data-Driven Public Sector," *OECD Digital Government Studies*, 2019. https://www.oecd-ilibrary.org/governance/the-path-to-becoming-a-data-driven-public-sector_059814a7-en

[16] Van Ooijen et al., Ibid.

[17] While it falls beyond the scope of this discussion paper to propose a methodology to measure the impact of public data resources -including the impact on policymaking and service delivery-, a forthcoming data.europa.eu research report will be dedicated to this topic.

[18] OECD, "Digital Government Index: 2019 Results," *OECD Public Governance Policy Papers*, 2020. https://doi.org/10.1787/4de9f5bb-en.

[19] Daniela Battisti, Francesco Mureddu and David Osimo, "The Public-Data Opportunity - Why Government Should Share More," *The Lisbon Council Discussion Paper,* 2019. https://lisboncouncil.net/publications/public-data-opportunity/

[20] Ibid.

users' needs.[21] For instance, the success of the open data initiatives of **France, Ireland** and **Spain** can be in large part explained by these countries' relentless efforts to engage with the user communities and monitor the re-use.[22] In **Germany**, many bilateral meetings are held with different civil society groups to understand each group's data needs.[23] It follows that if public institutions themselves are not sufficiently considered as data re-users from the outset of the data publication process, the public sector as a whole is unlikely to collect the direct benefits from the publication of open data.

Fortunately, there are good examples to learn from. For instance, in the context of the Data Agenda Government in the **Netherlands**, data re-use by public institutions is facilitated through peer-to-peer learning and sharing best practices of data-driven value creation.[24] In **Spain**, the Aporta initiative explicitly recognised the importance of data re-use by public institutions and organised a dedicated challenge around this theme.[25]

The launch of data.europa.eu as a single access point for European data provides an excellent momentum to foster demand-driven data publication and support to public sector re-users at a European scale. An approach to measure public institutions' data demand needs to be developed, so that data providers from EU institutions and Member States can adopt and leverage it in their activities. This is likely to attract new public sector re-users and will help them to find not only data that are relevant and of sufficient quality, but the appropriate tools and support to help them make the most of the data as well. Having better insights in the actual data needs of reusers in the public sector will support the implementation of the high-value datasets, as put forward in the Open Data Directive. A European Data Portal study concluded that defining the value of specific datasets is very complex and that relevant stakeholders from the full scope of impact -therefore also public sector reusers- should be involved to reach meaningful and feasible results.[26]

1.3   Aim and structure

This discussion paper aims to:

- Clarify the importance of public institutions as data re-users
- Identify methods and good practices in assessing public institutions' demand
- Stimulate further discussion on how to best foster open data re-use by public institutions[27]

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[21] Laura van Knippenberg, "Open Data Maturity Report 2020," *Publications Office of the European Union*, 2020. https://doi.org/10.2830/619187. Stefaan G. Verhulst and Andrew Young, "Toward an Open Data Demand Assessment and Segmentation Methodology," *Inter-American Development Bank*, 2018. https://publications.iadb.org/en/toward-and-open-data-demand-assessment-and-segmentation-methodology

[22] Cosmina Radu and Gianfranco Cecconi, "Analytical Report 13: Open Data Best Practices in Europe's Top Performers: Ireland, Spain and France," *Publications Office of the European Union*, 2020. https://doi.org/10.2830/05271

[23] OECD, "Open Government Data Report - Enhancing Policy Maturity for Sustainable Impact," *OECD Digital Government Studies*, 2018. https://www.oecd-ilibrary.org/governance/open-government-data-report_9789264305847-en

[24] Ministry of the Interior and Kingdom Relations, "NL DIGITAAL: Data Agenda Government," 2019. https://www.nldigitalgovernment.nl/wp-content/uploads/sites/11/2019/04/data-agenda-government.pdf

[25] State Secretariat for Digitalisation and Artificial Intelligence of the Ministry of Economic Affairs and Digital Transformation, "All a Challenge #Aporta2017," *datos.gob.es*, 2017, https://datos.gob.es/en/noticia/all-challenge-aporta2017.

[26] Huyer and Blank, Ibid.

[27] Even though the focus of this paper lies on government-to-government data sharing and use, the findings may also prove to be relevant for business-to-government data sharing via the data.europa.eu portal, as private sector data providers may also wish to develop a demand-driven strategy for data publication taking into account the needs of public sector re-users.

Section 2 continues with a description of existing approaches adopted by national governments and EU institutions to assess the open data demand of public institutions. Section 3 moves on with an overview of existing national and international indicators that measure such demand. To this end, seven international open data measurement frameworks are reviewed (see Annex A for the full methodological approach). The paper concludes in section 4 by listing key issues emerging from the research reported in the previous sections, which will be used to drive a stakeholder discussion on suitable methods and indicators to measure public institutions' data demand in the context of the data.europa.eu portal.

2 Existing approaches to assess public institutions' data demand

2.1 Approaches by EU Member States

Public institutions' data demand can be understood as a combination of popularity of existing datasets, interest in (new) data categories, requirements regarding data usability (quality, completeness, update frequency, quality of metadata, standardisation) and needs in terms of support to re-use (e.g. visualisation tools, online assistance, feedback mechanisms) that are specific to data-driven applications in the public sector. Assessing this demand is not a common practice in most Member States. Rather than gathering insight into the needs of re-users from the public sector, some countries have developed approaches to foster the demand for the data that are already available, but even such activity is rare. Only a few countries take a proactive strategy to encourage data re-use both outside and inside the public sector, via data awareness projects, hackathons, co-creation events, information sessions and regular training for civil servants.[28] In other words, supply drives demand and not the other way around.

In cases where countries go beyond fostering demand and want to measure the demand, this is generally still limited to consultations on the publication of government datasets. In other words, countries allow individuals and organisations to express their demand for new data and provide feedback on available public datasets. Yet, there is no real collaboration with re-users to create the support mechanisms they require for data re-use, such as data literacy programmes and data re-use partnerships.[29] Moreover, these activities are generally not specifically focused on the public sector. The consultations are held with private sector organisations, citizens, journalists, academia, civil society organisations and, civil servants.[30] For instance, in 2020, the **Netherlands** concluded a pilot with thematic data communities to bring together producers, re-users, and experts in specific domains, such as education and mobility.[31] Following the establishment of four active communities, the Dutch government committed to scaling up the initiative by another five. One of the key objectives was to bring together supply and demand for open data. Even though the communities' focus does not lie specifically with public sector re-users, several communities do include multiple public institutions. The education data community, for example, brings together 12 public institutions. Besides exchanges on the online forum on topics such as concrete data demands and examples of re-use, events are organised to bring the different stakeholders together.

The **United Kingdom** also has some examples of user engagement, such as creating an ecosystem of collaboration to increase the quality and access of public health services.[32] Additionally, physical and

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[28] Guillaume Lafortune and Barbara Ubaldi, "OECD 2017 OURdata Index: Methodology and Results," *OECD Working Papers on Public Governance*, 2017. https://doi.org/10.1787/2807d3c8-en

[29] OECD, "Open Government Data - Enhancing Policy Maturity for Sustainable Impact," *OECD Digital Government Studies*, 2018. p138. https://www.oecd-ilibrary.org/governance/open-government-data-report_9789264305847-en

[30] Ibid. p138.

[31] Open Government Partnership, "Independent Reporting Mechanism. Action Plan Review: Netherlands 2020-2022," 2021. https://www.opengovpartnership.org/documents/netherlands-action-plan-review-2020-2022-for-public-comment/

[32] Helen Desmond and Jack Hardinges, "Using Open Data for Public Services," *Open Data Institute*, 2018. https://theodi.org/article/using-open-data-for-public-services-report-2/

online consultations are held to inform open data plans from the government, for example to understand how data can be used to improve public policies and services.[33] To support public data providers in engaging with potential re-users in general, one-third of EU Member States (**Czech Republic, Finland, France, Germany, Greece, Ireland, Poland, Slovenia, and Spain)** have developed written guidance on conducting consultations.[34] When looking more specifically at the way in which public officials are consulted on their data needs, it turns out that physical consultations, such as focus or working groups are a more popular method than digital channels.

Several countries commission dedicated studies to know more about the users of their open data portals. While such studies are not focused on re-users from the public sector, they generally include insights on this specific user group as well. For example, **France**, the Open Data maturity study leader, conducts user surveys and interviews with users.[35] In the **Netherlands**, the government commissioned a study to know the re-users of three key government open data portals (statistics, geographic and general) and their needs.[36] The research team employed a combination of quantitative and qualitative research methods:

- analysing IP addresses and web statistics to identify user categories and countries, the data they use, data access methods, and the path taken toward the desired data sets;
- web crawling techniques (e.g. search APIs) to identify websites that mention the re-use of open data;
- a quantitative analysis of Tweets mentioning open data;
- online questionnaire and qualitative interviews with re-users;
- online prioritisation of obstacles and needs by re-users.

Regarding re-users from public institutions, the study was able to identify individual organisations at different levels of government as valuable visitors and re-users of the portals. Complementing off-portal engagement and measurement approaches, several Member States leverage features on the portals themselves for such purposes. According to the OECD, an open data portal is a valuable channel to pinpoint data demand and engage open data users.[37] 25 member state portals offer a user feedback channel, of which 24 allow users to provide feedback on a dataset level.[38] The most common way of publishing feedback is by using a contact form or sending an email, which is then forwarded to the responsible person or public body.[39]

Generally, this is just one-way communication, which does not foster any additional interaction with other users. **Austria** is the only country that provides online information on the average length to respond to requests sent through the user feedback section.[40] Other countries like **France** also offer some feedback mechanisms, although on a smaller scale. These features range from options such as

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[33] OECD, "Open Government Data - Enhancing Policy Maturity for Sustainable Impact," *OECD Digital Government Studie*s, 2018. p138. https://www.oecd-ilibrary.org/governance/open-government-data-report_9789264305847-en.

[34] Ibid. p151.

[35] Laura van Knippenberg, Ibid.

[36] Frederika Welle Donker, Rob Braggaar and Bastiaan van Loenen, "Hergebruikers van Open Data in Beeld [A View on Open Data Reusers]," 2019. https://kennisopenbaarbestuur.nl/media/256297/hergebruikers-van-open-data-in-beeld.pdf

[37] OECD, Ibid.

[38] Laura van Knippenberg, Ibid.

[39] Ibid.

[40] Ana Brandusescu et al., "ODB 4Th Edition Global Report," 2017. https://doi.org/10.2830/619187.

commenting on datasets, rating data and giving feedback about the portal.[41] The French national portal also has the functionality of submitting a use case per dataset. This fosters re-use of open data, as the examples may be featured on the portal.[42] **Ireland**, recently implemented a comment section under each dataset, including a 'like' button and a five-star rating. Users can filter the datasets based on "likes" or ratings.[43] Still, these initiatives are not solely focused on data demand by public institutions. Instead, Member States address multiple user types, such as citizens, private sector organisations and journalists, as a homogenous group. A *user* can be anyone, including a policymaker or a public servant.

These functions help Member States understand the demand from their users and which datasets are more vital than others. Such feedback instruments need to be thoroughly developed and should not be mistaken with basic feedback responses. In some countries, there is not much interest in getting systematic feedback from users, such as their requests for additional datasets or enhancements to the existing ones. Many portals have no user feedback mechanisms in place, while others only provide simple "contact us" forms for user complaints and possible recommendations. The goal of these feedback forms is to collect opinions mostly on technical concerns rather than the actual datasets.[44]

2.2   Approaches by EU institutions

There is little public evidence available on the activities undertaken by EU institutions that publish open data to engage with potential re-users from the public sector to know more about their data needs. The few studies that consider EU open data policies and practices generally focus on the supply side, not the demand.[45] A notable exception is the analytical report "Understanding supply and demand on the European Data Portal," even though it considers re-users in general and not public sector re-users specifically."[46] Similar to the aforementioned user research report commissioned by the **Netherlands**, this report demonstrates the value of web analytics tools to collect data on demand for (categories of) datasets and analyse changes over time. As such, it can provide insight into the demand for information on specific topics for which there may not be any datasets available yet. By looking at downloads, this method can also show which available datasets are the most popular and therefore most "in demand." However, this method does not provide insight into demand by user group or public institutions more specifically. To make this possible, portal page visits and on and off-portal searches would have to be linked to a user profile at an aggregate level, for instance, by using IP addresses or asking for a "user type" before allowing the download.

The lack policy reports and academic publications on EU institutions' open data activities and efforts to measure public institutions' data demand does not mean that EU data providers do not reach out

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[41] Kawtar Younsi Dahbi, Hind Lamharhar and Dalila Chiadmi, "Toward an Evaluation Model for Open Government Data Portals," *Information Systems and Technologies to Support Learning*, 2018. http://link.springer.com/10.1007/978-3-030-03577-8_55

[42] Laura van Knippenberg, Ibid.

[43] Ibid.

[44] Charalampos Alexopoulos et al., "Analysing the Characteristics of Open Government Data Sources in Greece," *Journal of the Knowledge Economy*, 2018. http://link.springer.com/10.1007/s13132-015-0298-8

[45] Vishal S. Arora et al., "Data Resource Profile: The European Union Statistics on Income and Living Conditions (EU-SILC)," *International Journal of Epidemiology*, 2015. https://academic.oup.com/ije/article-lookup/doi/10.1093/ije/dyv069

[46] Luis Daniel Ibáñez, Elena Simperl and Eline N. Lincklaen Arriëns, "Analytical Report 19: Understanding Supply and Demand," *Publications Office of the European Union*, 2021. https://data.europa.eu/en/highlights/analytical-report-19-understanding-supply-and-demand-european-data-portal

to public sector users or other user communities. It merely means that such activities are under-documented, at least in the public sphere. In order to encourage further cooperation, cross-sector collaboration and mutual learning it is paramount that best practices are shared, for instance through the data.europa academy.[47]

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[47] Publications Office of the European Union, "data.europa academy," 2022, https://data.europa.eu/en/academy

3 Indicators to measure open data demand by public institutions

3.1 Indicators at the national level

Section 2 showed that some Member States have implemented features on their national open data portals to assess data demand in general, which may be tailored to public sector users. These features range from the number of requested data to the amount of feedback given on a particular dataset. Although these are prominent values to measure open data demand, the framework applied by Member States to evaluate them is not well known. What is known is that some countries such as **Finland, Denmark, Spain and France** have taken some measures to evaluate the impact of open data on economic and social factors. These countries publish reports, conduct impact assessments, monitor open data on economic activities and provide data visualisations and APIs to the public.[48]

However, the variables or indicators used to measure open data demand (by any type of user) are not widely published, at least not in academic and policy literature. In other words, while it is known that some Member States have mechanisms to foster data demand in general, not much can be said on what demand and re-use related data they collect, nor how such data are analysed and evaluated. Further examination and discussion with stakeholders are necessary to know if data providers and ecosystem facilitators in the Member States have taken measures to evaluate public institutions' data demand, and which ones.

3.2 Indicators at the international level

Three out of seven reviewed international open data measurement frameworks, the Global Open Data Index, the Open Data Barometer and the Open Data Inventory focus entirely on the supply side of open data and do not include any indicator related to open data demand. Incidentally, two of these measurement efforts have ceased to exist. The Global Data Barometer, the European Open Data Maturity Index, the World Bank Open Data Readiness Assessment and the OECD OURdata Index do include metrics relevant to public institutions' open data demand. Annex B provides an overview of the examined frameworks.

3.2.1 Supply-focused indicators

From 2013 to 2017, the **Global Open Data Index** (GODI), developed by the international non-profit network Open Knowledge Foundation, measured the openness of government data internationally. Data providers consisted of local dataset assessors and domain experts performing a thematic review and a quality assurance process of the individual assessment of 15 key datasets.[49] As such, this index was crowdsourced by a global community of experts and advocates of open data.[50] It classified open

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[48] OECD, "The OECD 2019 Open Useful Reusable Data (OURdata) Index," *OECD Public Governance Policy Papers*, 2020. https://doi.org/10.1787/45f6de2d-en.

[49] Anneke Zuiderwijk, Ali Pirannejad and Iryna Susha, "Comparing Open Data Benchmarks: Which Metrics and Methodologies Determine Countries' Positions in the Ranking Lists?," *Telematics and Informatics*, 2021. https://doi.org/10.1016/j.tele.2021.101634

[50] Ibid.

data in a binary way. Data may be completely open or not, the index did not consider a dataset "50%" open.[51] The list of data categories ranged from budget, spending, public procurement, land ownership to water quality, national law, and so on. The 2016/2017 results formed the last published edition.

Another supply-focused index, the **Open Data Barometer**, published by the World Wide Web Foundation, ran from 2013 to 2016. Its goal was to measure how governments publish and use open data for accountability, innovation and social impact. The last full edition was issued in 2016. A Leaders Edition consisting of the assessment of 30 governments who have adopted the International Open Data Charter Principles was launched in 2018.[52] It used an in-depth technique that integrated contextual data and secondary indicators to analyse global trends and give comparative statistics on the open data portals of governments.[53] Even though the Open Data Barometer did account for the impact of open data on increasing government efficiency and effectiveness, no indicator was used to calculate the demand for open data by or within public institutions. It is succeeded by the Global Data Barometer, which is discussed in more detail below.

The **Open Data Inventory** (ODIN) developed by the Open Data Watch aims to identify critical gaps, promote open data policies, improve data access, and encourage dialogue between national statistical offices and data users.[54] Data collection starts with the assessment of national statistical offices' websites. ODIN reviews published statistics in over twenty topical categories, grouped under three overall categories: 1) social statistics, 2) economic and financial statistics, and 3) environmental statistics. In the 2020/21 assessment, 22 categories have been established. The overall default score weighs the three groups equally. As the ODIN assessment focuses on open data supply, no representative indicator in any category addresses open data demand.

3.2.2 Demand-focused indicators

The bi-annual **Global Data Barometer** (GDB) is a new benchmarking effort undertaken by the Latin-American initiative for open data ILDA and the Data for Development Network.[55] The GDB builds on the framework of the Open Data Barometer, extending the scope beyond open data supply to data policy in general with consideration of the role of the end user. Based on an expert survey supplemented by secondary data, the new benchmark aims to fill critical knowledge gaps on how data policy and practice are unfolding in different sectors, regions, and countries around the world. While the launch of the first edition covering over 108 countries was announced for the end of 2021, at the time of writing of this paper the results have not been published yet, and the same goes for the full methodology. The available documentation, however, does reveal the presence of demand-focused metrics as part of the core modules "governance" and "capability", albeit not specifically considering data re-users from the public sector. Information on the metrics in the other two core modules "Availability" and "Use & Impact" is not yet available.

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[51] OKFN, "Global Open Data Index," Open Knowledge Foundation, 2020. https://index.okfn.org/methodology/
[52] Open Data Barometer. "Open Data Barometer-Leaders Edition: ODB Methodology-v1.0."
http://opendatabarometer.org/doc/leadersEdition/ODB-leadersEdition-Methodology.pdf
[53] Ana Brandusescu et al., "ODB 4Th Edition Global Report," 2017. https://doi.org/10.2830/619187.
[54] Jamison Crowell and Eric Swanson, "ODIN - Open Data Inventory 2020/21," 2020.
https://opendatawatch.com/publications/odin-open-data-inventory-2020-21-executive-summary/
[55] ILDA and D$D.net, "Global Data Barometer," 2021. https://globaldatabarometer.org

The **European Open Data Maturity Assessment** is the annual benchmark study first initiated by the European Data Portal, and now continued by data.europa.eu on the development in the field of open data in Europe.[56] It assesses the level of open data maturity in the European Union's Member States (EU27), the participating European Free Trade Association (EFTA) countries Iceland, Norway, and Switzerland, the participating Eastern Partnership (EaP) countries Georgia and Ukraine, as well as Montenegro and the UK. The report supports countries to better understand their maturity level, capture their progress and identify the areas for improvement. Data collection is carried out through the distribution of a questionnaire to the national open data representatives.

The evaluation is based on four dimensions of open data: *policy*, focusing on countries' open data policies and strategies; *impact*, looking into the activities to monitor and measure open data re-use; *portal*, assessing portal functions and features that enable users to access open data via the national portal and support interaction within the open data community and *quality*, focusing on mechanisms that ensure the quality of the (meta)data. Similar to previously discussed indices, in this case, there is no clear-cut indicator measuring open data demand by public institutions. Nevertheless, the impact and portal dimensions contain several indicators that may be leveraged to analyse public institutions' open data demand (see Annex C for a complete overview). The impact dimension mainly focuses on open data re-use cases in different fields (political, social, environmental and economic), several of which may be adapted to measure public institutions' data demand. For instance, some of the questions investigate if governments have developed data-driven applications in a number of areas.[57] The portal dimension of the questionnaire contains an indicator on portal features, which considers the presence of feedback mechanisms and the possibility to send data requests. This indicator has the potential to be tailored to measure requests from public sector re-users.

In summary, the European Open Data Maturity assessment does include measurements related to open data demand, even if indirectly and focusing on users' requests and impact. Furthermore, these questions have the potential to be further developed and complemented by other questions, potentially leading to a dedicated indicator that specifically addresses data demand by user group.

The **Open Data Readiness Assessment** (ODRA) tool is part of the Open Data Toolkit published by the World Bank. As stated in the Open Data Readiness Assessment Users' Guide, the purpose of the tool is to assist government authorities at both the national and sub-national level in planning what actions they could consider in order to establish an Open Data programme. The assessment is based on a rapid diagnostic performed by the team of experts from the World Bank Group. It is not an annual systematic measurement effort, but an ad-hoc activity undertaken on demand by the national government.[58]

The team of experts works closely with the clients (i.e. country officials) to retrieve information, hold interviews and do desk research on eight dimensions. One dimension, "Demand for Open Data" contains several relevant indicators.[59] The indicators, however, focus on data demand by re-users

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[56] Daphne van Hesteren and Laura van Knippenberg, "Open Data Maturity Report 2021," Luxembourg: Publications Office of the European Union, 2021. https://data.europa.eu/sites/default/files/landscaping_insight_report_n7_2021.pdf

[57] Publications Office of the European Union, "Open Data Maturity Assessment 2021. Detailed Country Scores," *Open Data in Europe 2021*, 2021. https://data.europa.eu/sites/default/files/country_scores_2021.xlsx

[58] Zuiderwijk et al., Ibid.

[59] World Bank Group, "Open Data Readiness Assessment – Part B: Methodology," 2015. https://opendatatoolkit.worldbank.org/docs/odra/odra_v3_methodology-en.pdf

outside government, such as NGOs and businesses. For instance, country officials are asked: "Which businesses use government data or deliver services which could benefit from access to it?". Such questions can easily be adapted to the context of public sector users, by replacing "businesses" by "EU agencies", "ministries/departments", and "local authorities". For a complete overview of the relevant indicators and questions, see Annex C.

This is one of few international measurement frameworks that explicitly addresses both the supply and the demand side of open data. Starting from this framework, the first necessary action to undertake should be identifying the target groups and separating civil society from the private and the public sector to obtain a more accurate result pertinent to this research. However, one of the drawbacks of the assessment tool is that it does not *actually* measure demand. Since the evaluation is carried out through qualitative research, it essentially provides an overview of the ongoing activities of the client requesting the assessment. For this reason, answers differ heavily among themselves and are evaluated in relation to the projects, professionals/officers and policies implemented by each institution.

The OECD **OURdata index** provides policy evidence of the main achievements and challenges related to the long-term sustainability of open data policies across OECD member and partner countries. Although the index is not specifically focused on measuring the data demand coming from the public sector, some metrics may be utilised to determine open data demand of public institutions as data re-users. The index is divided into three pillars: data availability, data accessibility and government support for the re-use of open data.[60] The first two pillars measure the actual scope of available datasets in national portals and how accessible they are.

The third pillar evaluates the actions and policies that governments undertake to promote the re-use of open data among several re-user groups, including public officials. These questions are not directly related to the demand for open data by public institutions. Still, they support the re-use of open data within the public sector by sensitising public servants to work with open data, which is necessary when discussing open data demand in the public administration. The full list of relevant indicators is available in Annex C.

To collect data for the OURdata index, the OECD sends a questionnaire to national chief data officers across countries, who know who to contact in the administration to get the correct answers to the questionnaire. The downside is that not every country has a dedicated chief data officer, potentially bringing inconsistencies in the results. This method may result in issues of different interpretations of the answers the officers provide and in further assigning correct values.[61]

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[60] OECD, "The OECD 2019 Open Useful Reusable Data (OURdata) Index," *OECD Public Governance Policy Papers,* 2020. https://doi.org/10.1787/45f6de2d-en.

[61] Emmanuel M. Ikart, "Survey Questionnaire Survey Pretesting Method: An Evaluation of Survey Questionnaire via Expert Reviews Technique," *Asian Journal of Social Science Studies*, 2019. http://journal.julypress.com/index.php/ajsss/article/view/565.

4 Key issues for stakeholder discussion

With the launch of data.europa.eu as the key data hub for re-users from all over Europe and a growing awareness of the importance of addressing their needs to have a real impact, European open data policies are at a critical point to move from a supply to a demand-driven approach. Re-users in the public sector, from EU institutions, bodies and agencies to national, regional, and local authorities in Member States, are a much-overlooked group and deserve special attention to make sure they find the data and support to help them design and deliver better policies and services.

The review of existing approaches and indicators shows that measuring public institutions' data demand is not a common practice for European data providers or ecosystem facilitators. If initiatives in this direction are developed at all, they generally consider data re-users as a homogeneous group and do not tend to public sector re-users specifically. Moreover, they usually focus on *fostering* demand for existing open data rather than *measuring* data demand. Consequently, there is a strong need to exchange best practices and facilitate a discussion and mutual learning between the authorities responsible for managing European and national open data portals (data ecosystem facilitators) and the data providers and re-users in EU, national, regional, and local public institutions about appropriate methods and indicators to measure and foster public institutions' data demand, and measure and fulfil the gap between data supply and data demand. Several issues to be addressed during the stakeholder discussion emerge from this paper's research:

1. **Why is it important to measure public institutions' data demand?** This is an essential first question before discussing specific methods and indicators to gauge the needs of public institutions as data re-users. Awareness about the relevance of data re-use within the public sector and knowing the needs of these re-users is a prerequisite for data providers and ecosystem facilitators to take up an active role in moving to a demand-driven approach to data publication and user support for public value creation. The short- and long-term benefits of such approach for all stakeholders and the open data ecosystem as a whole should be discussed while also considering the associated costs.

2. **What are suitable engagement activities for public sector re-users?** Engagement activities are essential to obtain a more in-depth insight in the needs of existing public sector re-users and measure the demand of public institutions that have no prior awareness or interest in the topic of open data. Such assessments should be tailored to the specific characteristics of this user group and sub-groups as needed and integrated into engagement activities to foster re-use around themes that matter for them. At the same time, governments should find the right balance between strategic data supply (publish with a purpose) and response to data demand in line with users' needs.

3. **What is needed to evolve demand measurement from an occasional to a structural activity?** Assessing data demand is not a one-off exercise. It should be structurally embedded in the further development of data.europa.eu. Users' needs change over time and this should be taken into account for the portal's development. A combination of quantitative and qualitative methods as well as continuous (e.g. web analytics) and regularly timed (e.g. Open Data Maturity Assessment) monitoring is most likely needed to adequately assess and simultaneously foster the data demand of public institutions as re-users of data.europa.eu.

4. **How can automated metrics be leveraged to measure the data demand by public institutions?** The automated use of web analytics (e.g. regarding IP addresses, search terms, feedback features, downloads, re-use cases) can facilitate continuous monitoring of searches leading to the portal and user behaviour on the portal itself. How can these methods be used to pinpoint the needs of public sector re-users while respecting privacy and confidentiality considerations as well as the value of openness itself?

5. **To what extent can existing international indicators be re-used and complemented to measure public institutions' data demand?** The indicators related to open data demand already in place at the international level are based on either questionnaires sent to public officials or interviews held by expert groups with public officials. As only a few of them provide data that is directly useful to measure public institutions' data demand, adapted versions and complementary questions would need to be developed and harmonised in order to establish and consolidate a new framework that can be universally employed.

6. **How can data providers in EU institutions and Member States be supported in adopting a demand-driven approach towards the publication of open data for public sector purposes?** The research undertaken for this discussion paper shows evidence of a limited number of Member States moving towards a demand-driven approach to data publication. The role of EU institutions as data providers and ecosystem facilitators, especially when it comes to their engagement with public officials in other EU institutions, Member States or local authorities is largely overlooked in open data literature. Consequently, data providers from both Member States and EU institutions can benefit from coordinated support in measuring and considering public institutions' data demand.

Facilitating a stakeholder discussion to assess and address public institutions' data demand

The exploration of these issues will take place during a one-year running campaign featuring several blog posts to be published on data.europa.eu (e.g. "Towards demand-driven open data in EU institutions") and a data.europa academy webinar with data **providers**, authorities responsible for open data policies and portals (data ecosystem **facilitators**), and **re-users** from Member States and EU institutions. The webinar will allow for an in-depth discussion of specific themes emerging from this discussion paper. It aims to facilitate the exchange of examples on demand-driven open data value creation by public institutions at different levels of government and enable the discussion on how EU Member States and institutions involve potential re-users, measure demand and promote re-use among public institutions at all levels.

Bibliography

[1]   Alexopoulos, Charalampos, Euripidis Loukis, Spiros Mouzakitis, Michalis Petychakis and Yannis Charalabidis. "Analysing the Characteristics of Open Government Data Sources in Greece." *Journal of the Knowledge Economy* 9, no. 3 (2018): 721–53. https://doi.org/10.1007/s13132-015-0298-8

[2]   Arora, Vishal S., Marina Karanikolos, Amy Clair, Aaron Reeves, David Stuckler and Martin McKee. "Data Resource Profile: The European Union Statistics on Income and Living Conditions (EU-SILC)." *International Journal of Epidemiology* 44, no. 2 (2015): 451–61. https://doi.org/10.1093/ije/dyv069

[3]   Battisti, Daniela, Francesco Mureddu and David Osimo. "The Public-Data Opportunity - Why Government Should Share More." *The Lisbon Council Discussion Paper*, 2019. https://lisboncouncil.net/publications/public-data-opportunity

[4]   Berends, Jorn, Wendy Carrara, Wander Enbers and Heleen Vollers. "Reusing Open Data. A Study on Companies Transforming Open Data to Economic and Societal Value." Luxembourg, 2020. https://doi.org/10.2830/876679

[5]   Brandusescu, Ana, Carlos Iglesias, Kristen Robinson, Jose M Alonso, Craig Fagan, Anne Jellema and Dillon Mann. "ODB 4Th Edition Global Report," 2017. https://doi.org/10.2830/619187

[6]   Carrara, Wendy, Wae San Chan, Sander Fischer and Eva van Steenbergen. "Creating Value through Open Data - Study on the Impact of Re-Use of Public Data Resources." Luxembourg: Publications Office of the European Union. 2017. https://doi.org/10.2759/328101

[7]   Crowell, Jamison and Eric Swanson. "ODIN - Open Data Inventory 2020/21," 2020. https://opendatawatch.com/publications/odin-open-data-inventory-2020-21-executive-summary

[8]   Dahbi, Kawtar Younsi, Hind Lamharhar and Dalila Chiadmi. "Toward an Evaluation Model for Open Government Data Portals." *Information Systems and Technologies to Support Learning*, 502–11. Springer, Cham, 2018. https://doi.org/10.1007/978-3-030-03577-8_55

[9]   Dekkers, Makx, Femke Polman, Robbin te Velde and Marc de Vries. "Measuring European Public Sector Information Resources," 2006. http://opendatatales.com/wp-content/uploads/2019/02/Dekkers-et-al.-2006-Measuring-European-Public-Sector-Information-Resou.pdf

[10]   Desmond, Helen and Jack Hardinges. "Using Open Data for Public Services." *Open Data Institute*, 2018. https://theodi.org/article/using-open-data-for-public-services-report-2

[11]   European Commission. "Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on Open Data and the Re-Use of Public Sector Information." *Official Journal of the European Union*, 2019. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019L1024

[12]   Hesteren, Daphne van, and Laura van Knippenberg. "Open Data Maturity Report 2021." Luxembourg: Publications Office of the European Union. 2021. https://data.europa.eu/sites/default/files/landscaping_insight_report_n7_2021.pdf

[13] Huyer, Esther and Marit Blank. "High-Value Datasets: Understanding the Perspective of Data Providers. Analytical Report N15." Luxembourg: Publications Office of the European Union. 2020. https://doi.org/10.2830/363773

[14] Huyer, Esther, Laura van Knippenberg, Eline Lincklaen Arriëns and Marit Blank. "The Economic Impact of Open Data - Opportunities for Value Creation in Europe." Luxembourg: Publications Office of the European Union. 2020. https://doi.org/10.2830/63132

[15] Ibáñez, Luis Daniel, Elena Simperl, and Eline N. Lincklaen Arriëns. Analytical Report 19: Understanding Supply and Demand on the European Data Portal. Luxembourg: Publications Office of the European Union. 2021. https://doi.org/10.2830/105287

[16] Ikart, Emmanuel M. "Survey Questionnaire Survey Pretesting Method: An Evaluation of Survey Questionnaire via Expert Reviews Technique." *Asian Journal of Social Science Studies* 4, No. 2, 2019. https://doi.org/10.20849/ajsss.v4i2.565

[17] Knippenberg, Laura van. "Open Data Maturity Report 2020." Luxembourg: Publications Office of the European Union. 2020. https://doi.org/10.2830/619187

[18] Lafortune, Guillaume and Barbara Ubaldi. "OECD 2017 OURdata Index: Methodology and Results." *OECD Working Papers on Public Governance*, No. 30 Paris: OECD Publishing, 2017. https://doi.org/https://doi.org/10.1787/2807d3c8-en

[19] Ministry of the Interior and Kingdom Relations. "NL DIGITAAL: Data Agenda Government," 2019. https://www.nldigitalgovernment.nl/wp-content/uploads/sites/11/2019/04/data-agenda-government.pdf

[20] Misuraca, Gianluca, Egidijus Barcevičius and Cristiano Codagnone. "Exploring Digital Government Transformation in the EU - Understanding Public Sector Innovation in a Data-Driven Society." Luxembourg: Publications Office of the European Union. 2020. https://econpapers.repec.org/RePEc:ipt:iptwpa:jrc121548

[21] OECD. "Digital Government Index: 2019 Results." *OECD Public Governance Policy Papers*, 2020. https://doi.org/https://doi.org/10.1787/4de9f5bb-en

[22] ———. "Open Government Data Report - Enhancing Policy Maturity for Sustainable Impact." *OECD Digital Government Studies*. Paris: OECD Publishing. 2018. https://doi.org/10.1787/9789264305847-en

[23] ———. "The OECD 2019 Open Useful Reusable Data (OURdata) Index." *OECD Public Governance Policy Papers*. No. 01. Paris: OECD Publishing. 2020. https://doi.org/https://dx.doi.org/10.1787/45f6de2d-en

[24] ———. "The Path to Becoming a Data-Driven Public Sector." *OECD Digital Government Studies*. Paris: OECD Publishing, 2019. https://doi.org/10.1787/059814a7-en

[25] OKFN. "Global Open Data Index." Open Knowledge Foundation, 2020. https://index.okfn.org/methodology

[26] Ooijen, Charlotte van, Barbara Ubaldi and Benjamin Welby. "A Data-Driven Public Sector: Enabling the Strategic Use of Data for Productive, Inclusive and Trustworthy Governance." *OECD Working Papers on Public Governance*. No. 33. Paris: OECD Publishing, 2019. https://doi.org/10.1787/09ab162c-en

[27] Open Data Charter. "International Open Data Charter," 2015. https://opendatacharter.net/wp-content/uploads/2015/10/opendatacharter-charter_F.pdf

[28] Open Government Partnership. "Independent Reporting Mechanism. Action Plan Review: Netherlands 2020-2022," 2021. https://www.opengovpartnership.org/documents/netherlands-action-plan-review-2020-2022-for-public-comment

[29] Radu, Cosmina and Gianfranco Cecconi. "Analytical Report 13: Open Data Best Practices in Europe's Top Performers: Ireland, Spain and France." Luxembourg: Publications Office of the European Union.2020. https://doi.org/10.2830/05271

[30] Snyder, Hannah. "Literature Review as a Research Methodology: An overview and Guidelines." *Journal of Business Research*, 104, 2019. https://doi.org/10.1016/j.jbusres.2019.07.039

[31] State Secretariat for Digitalisation and Artificial Intelligence of the Ministry of Economic Affairs and Digital Transformation. "All a Challenge #Aporta2017," *datos.gob.es*, 2017. https://datos.gob.es/en/noticia/all-challenge-aporta2017

[32] Verhulst, Stefaan G. and Andrew Young. "Toward an Open Data Demand Assessment and Segmentation Methodology." *Inter-American Development Bank*, 2018. https://doi.org/10.18235/0001529

[33] Welle Donker, Frederika, Rob Braggaar and Bastiaan van Loenen. "Hergebruikers van Open Data in Beeld [A View on Open Data Reusers]," 2019. https://kennisopenbaarbestuur.nl/media/256297/hergebruikers-van-open-data-in-beeld.pdf

[34] Wernberg, Joakim. "Towards a Cross-Border Open Data Agenda. A Case for a Macro-Regional Agenda on Open Government Data in the Baltic Sea Region," 2016. http://topofdigital.eu/wp-content/uploads/2015/03/OPEN-DATA-2017-WEB-A4_22-12.pdf

[35] World Bank Group. "Open Data Readiness Assessment – Part B: Methodology," 2015. https://opendatatoolkit.worldbank.org/docs/odra/odra_v3_methodology-en.pdf

[36] Zuiderwijk, Anneke, Ali Pirannejad and Iryna Susha. "Comparing Open Data Benchmarks: Which Metrics and Methodologies Determine Countries' Positions in the Ranking Lists?" *Telematics and Informatics* 62, no. April (2021): 101634. https://doi.org/10.1016/j.tele.2021.101634

Annex A: Methodological approach

This discussion paper has been developed on the basis of a semi-systematic literature review and desk research into international open data measurement frameworks.

Literature review

An extensive literature review following a semi-systematic review process helps to synthesise the state of knowledge on existing approaches in (open) data initiatives at the European and national levels to measure open data demand by public institutions.[62]

The review considers well-established, peer-reviewed academic and policy literature, thereby excluding blogs and similar media outlets. Furthermore, only publications dating from 2015 on are taken into account as the purpose of the literature review is to get insight into current methods and practices.

1. First, relevant articles are identified by applying a research string of keywords in a wide variety of search engines such as European Union datasets, ResearchGate and OECD iLibrary. Keywords include but are not limited to words, such as "open data user engagement", "measuring open data demand" and "open data re-use in the public sector."

2. Second, the abstracts of the identified sources are screened to exclude non-relevant case descriptions, such as open data provision at the regional and local levels of government.

3. Third, the selected sources are analysed to ensure they contain relevant information to help answer the research question.

Figure 1 provides an outline of the aforementioned review process of identification, eligibility, and inclusion.

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[62] Literature reviews are useful when the aim is to provide an overview of a certain issue or research problem. Typically, a semi-systematic literature review is conducted to evaluate the state of knowledge on a particular topic. It can be used, for example, to create research agendas, identify gaps in research, or simply discuss a particular matter. See Hannah Snyder, "Literature Review as a Research Methodology: An overview and Guidelines," *Journal of Business Research*, 2019, https://doi.org/10.1016/j.jbusres.2019.07.039.

Figure 1 Literature review process
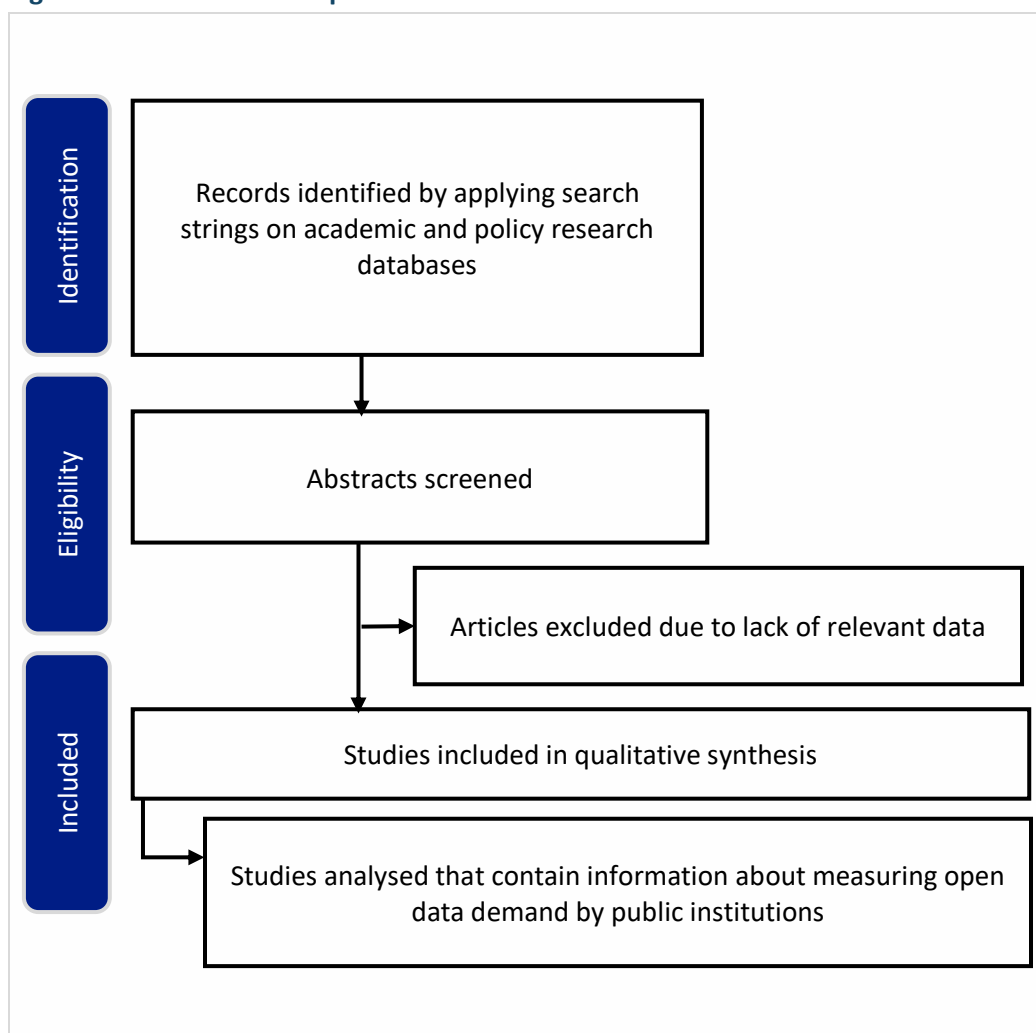
Desk research into international open data measurement frameworks

The second part of the analysis focus on identifying relevant indicators in international open data measurement frameworks. Sources for the desk research are dedicated websites and reports describing the measurement frameworks.

The following frameworks have been reviewed by examining documentation on their methodology:

- The Global Data Barometer (IDLA and D4D.net)
- The Global Open Data Index (Open Knowledge Foundation)
- The Open Data Barometer (World Wide Web Foundation)
- The Open Data Inventory (Open Data Watch)
- The Open Data Maturity Assessment (European Union)
- The Open Data Readiness Assessment (World Bank)
- The Open Usable and Reusable (OUR) data Index (OECD)

Indicators considered relevant are of two types:

1. The indicator measures an aspect of open data demand by public institutions;

2. The indicator measures an aspect closely related to open data demand by public institutions, making it possible to use it as a basis for the development of a new indicator.

Annex B International open data measurement frameworks

Title	Relevant metrics	Focus	Data collection methods	Pros and cons
Global Data Barometer (IDLA and D4D.net)	12	Measures data governance, data capability, data availability, and data use for the public good at the country level.	Regional research partners Peer-reviewed expert survey Sectoral expert partnerships Selected secondary data	+ Conceptually strong framework + Collaborative and open project + Extensive geographic coverage (108+ countries) - Under development
Global Open Data Index (Open Knowledge Foundation) *Last edition 2017*	0	Measures the accessibility and openness of many different data categories such as budget, election results and land ownership.	Crowdsourced by a global community of experts and advocates of open data	+ Work with people who are interested in the topic - Additional review processes are necessary - Analysis is not considered if all the 15 categories are not filled by evaluators
Open Data Barometer (World Wide Web Foundation) *Last edition 2016*	0	Uncovers the prevalence and impact of open data initiatives around the world and ranking countries on readiness for open data initiatives, implementation of open data programs, and the impact that open data is having on business, politics, and civil society.	Government self-assessment, peer-reviewed survey and selection of secondary data	+ Creates valuable source of inputs from governments - Relies on government self-assessment
Open Data Inventory (Open Data Watch)	0	Measures how complete a country's statistical offerings are and whether their data meet international standards of openness.	Research carried out by trained researchers. Inputs from government officials taken into consideration. Two rounds of review conducted by Open Data Watch staff	+ Extensive geographic coverage (180 countries) - Relies heavily on government officials' data input, which might not be periodically updated

Title	Relevant metrics	Focus	Data collection methods	Pros and cons
Open Data Maturity Assessment (European Union)	21	Serves as a benchmark to gain insights into the development achieved in the field of open data in Europe by assessing the level of maturity against four dimensions: policy, portal, impact, and quality.	Government survey completed by officials with validation and analysis from the European Data Portal team in cooperation with government officials.	+ Potential tailoring of indicators - Additional questions added each year to the questionnaire might lead to consistency issues in reports
Open Data Readiness Assessment (World Bank)	13	Assesses what actions a government authority could consider in order to establish an Open Data programme, at either the national level or in a sub-national government, or individual public agency, based on a rapid diagnostic of eight dimensions.	Data collection is carried out through interviews to clients by a joint team consisting of a team of Open Data experts and a counterpart team of the government agency requesting the assessment	+ Dimension 5 assesses "demand for open data" - Not a measurement tool, but a diagnostic and planning tool based on a qualitative assessment
Open, Useful and Re-usable data (OURdata) Index (OECD)	8	Measures data availability, data accessibility and government support for the re-use of data.	Questionnaire to chief data officers from public sector agencies	+ Contact with the direct responsible + Maintain steady contact throughout the years - Not every country has policies to assign chief data officers - Officers may have different styles of evaluation

Annex C International indicators related to public institutions' data demand

Index	Indicator	Metric (question)	Relevance/applicability
Global Data Barometer	Governance: data management	There are clearly documented processes for soliciting and integrating feedback from external users to improve data quality. (No, Partially, Yes)	High/Tailor to purpose
Global Data Barometer	Capability: government support for reuse/existence	Is there evidence of a government strategy to support and encourage data reuse?	Medium/Tailor to purpose
Global Data Barometer	Capability: government support for reuse/kinds of capacities	There is evidence of government efforts to support open government data reuse. (No, Partially, Yes) There is evidence of government efforts to support data reuse in a general sense. (No, Partially, Yes) There is evidence of government efforts to support private sector or NGO data reuse. (No, Partially, Yes) There is evidence of government efforts to support crowdsourced data reuse. (No, Partially, Yes) There is evidence of government efforts to support data reuse from various data topics. (No, Partially, Yes)	Medium/Tailor to purpose
Global Data Barometer	Capability: government support for reuse/user groups	There is evidence of government efforts to support data reuse by civil society organizations. (No, Partially, Yes) There is evidence of government efforts to support data reuse by media. (No, Partially, Yes) There is evidence of government efforts to support data reuse by scholars and academic institutions. (No, Partially, Yes) There is evidence of government efforts to support data reuse by the private sector. (No, Partially, Yes)	High/Tailor to purpose
Global Data Barometer	Capability: government support for reuse/specific features:	Government support for data reuse involves communication and community building efforts. (No, Partially, Yes)	High/Tailor to purpose
European Data Maturity Assessment	2.2 Political Impact	39. Has open data had a low/medium/high impact on increasing government efficiency, e.g. reducing operational costs? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.2 Political Impact	40. Has open data had a low/medium/high impact on increasing government effectiveness, e.g. improving quality of service delivery? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose

Index	Indicator	Metric (question)	Relevance/applicability
European Data Maturity Assessment	2.2 Political Impact	41. Has open data had a low/medium/high impact on increasing transparency and accountability in your country? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.2 Political Impact	42. Is open data used in policy-making processes in your country (i.e. are public administrations making use of the data as evidence for the problem identification and policy formulation)?	High/Tailor to purpose
European Data Maturity Assessment	2.2 Political Impact	43. Is open data used in decision-making processes in your country (i.e. are public administrations making use of the data as evidence to be included in their daily operations)?	High/Tailor to purpose
European Data Maturity Assessment	2.3 Social Impact	45. Has open data had a low/medium/high impact on increasing the inclusion of marginalised groups in society? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.3 Social Impact	46. Has open data had a low/medium/high impact on raising awareness concerning housing in the city? Please provide examples of how open data has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.3 Social Impact	47. Has open data had a low/medium/high impact on raising awareness on health and wellbeing related issues (e.g. on the COVID-19 pandemic)? Please provide examples of how open data has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.4 Environmental Impact	49. Has open data had a low/medium/high impact on raising awareness on the water and/or air quality in your country? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.4 Environmental Impact	50. Has open data had a low/medium/high impact on raising awareness on the noise level in cities? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.4 Environmental Impact	51. Has open data had a low/medium/high impact on dealing with waste management aspects? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose

Index	Indicator	Metric (question)	Relevance/applicability
European Data Maturity Assessment	2.4 Environmental Impact	52. Has open data had a low/medium/high impact on enabling more environmental-friendly transport systems in cities? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.5 Economic Impact	54. Has open data had a low/medium/high impact at macro-economic level in your country? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.5 Economic Impact	55. Has open data had a low/medium/high impact at micro-economic level in your country? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	2.5 Economic Impact	56. Has open data had a low/medium/high impact on economic benefits for public administrations in your country? Please provide examples of how open data that has been used in research or to develop applications on the topic (whether developed by government or by civil society).	High/Tailor to purpose
European Data Maturity Assessment	3.1 Portal Features	64. Does the national portal offer a feedback mechanism at data set level?	High/Tailor to purpose
European Data Maturity Assessment	3.1 Portal Features	65. Does the national portal offer a general feedback mechanism for users?	High/Tailor to purpose
European Data Maturity Assessment	3.1 Portal Features	66a. Does the national portal offer the possibility for users to request data sets?	High/Tailor to purpose
European Data Maturity Assessment	3.1 Portal Features	66b. If yes, what is the frequency of these requests?	High/Tailor to purpose
European Data Maturity Assessment	3.1 Portal Features	68a. Does the team monitor the extent to which requests (either via the portal or otherwise) result in the publication of the requested data?	High/Tailor to purpose
European Data Maturity Assessment	3.1 Portal Features	68b. If yes, to what degree do these requests result in the publication of the requested data?	High/Tailor to purpose

Index	Indicator	Metric (question)	Relevance/applicability
ODRA	5.1 What is the level and nature of actual demand and latent demand for data from Civil Society, Development Partners and the media?	1. Who are the civil society champions for Open Data?	Medium/Tailor to purpose
ODRA	5.1 What is the level and nature of actual demand and latent demand for data from Civil Society, Development Partners and the media?	2. Which NGOs are using government data in a systematic way in their work, reporting, etc.?	High/Tailor to purpose
ODRA	5.1 What is the level and nature of actual demand and latent demand for data from Civil Society, Development Partners and the media?	3. Which Development Partners are using which government data in their work? What data do they want?	High/Tailor to purpose
ODRA	5.1 What is the level and nature of actual demand and latent demand for data from Civil Society, Development Partners and the media?	5. What requests of data have been made by civil society/NGOs? How would they express these requests? How have they been invited to make requests for data?	High/Tailor to purpose
ODRA	5.2 What are the level and nature of actual demand and latent demand for data from business/the private sector?	1. Which businesses use government data or deliver services which could benefit from access to it?	High/Tailor to purpose
ODRA	5.2 What are the level and nature of actual demand and latent demand for data from business/the private sector?	2. What local businesses use geospatial data and maps, weather or transport information? What data do they consider the government should make available?	Medium/Tailor to purpose
ODRA	5.2 What are the level and nature of actual demand and latent demand for data from business/the private sector?	3. What businesses, local or branches of international firms, exist to provide value-added services to business-to-business commerce such as credit rating, business directories, market intelligence? What government data would they like to see released?	Medium/Tailor to purpose
ODRA	5.3 How do public agencies listen to demands for data and respond?	1. What is the process for identifying and meeting demand for data, either outside government or inside?	Directly applicable

Index	Indicator	Metric (question)	Relevance/applicability
ODRA	5.3 How do public agencies listen to demands for data and respond?	2. If there is an access to information law or freedom of information law, what types of information are most demanded under the law?	Low/Tailor to purpose
ODRA	5.3 How do public agencies listen to demands for data and respond?	3. What process exists for people to request information from public agencies / government? What information is most requested	High/Tailor to purpose
ODRA	5.3 How do public agencies listen to demands for data and respond?	4. How are government priorities for statistics decided, and on what evidence?	Medium/Tailor to purpose
ODRA	5.4 How do external stakeholders view public agencies' willingness to listen to demands for data and respond?	1. How do external stakeholders view the process for identifying and meeting demand for data from outside government?	Low/Tailor to purpose
ODRA	5.4 How do external stakeholders view public agencies' willingness to listen to demands for data and respond?	2. How responsive do external stakeholders consider the government is in responding to requests for information?	Low/Tailor to purpose
OURdata index	Government support to the re-use/Frequency of training events for public officials to support data re-use	Q.60. At the central/federal level of government, are there guidelines available for public servants on how best to leverage open government data in policy development processes?	Medium/Directly applicable
OURdata index	Government support to the re-use/Frequency of training events for public officials to support data re-use	Q.64. Since January 2012, have you conducted a large-scale consultation with Ministries/agencies to collect feedback from them on how best to support data re-use at the central/federal level of government?	High/Directly applicable
OURdata index	Government support to the re-use/ Frequency of information sessions and focus groups for public officials to support	Q.56. At the central/federal government are line ministries/agencies formally encouraged to raise awareness among public servants regarding the opportunities to re-use open government data inside the public sector?	High/Directly applicable
OURdata index	Government support to the re-use/Frequency of information sessions and focus groups for public officials to support	Q.57. In practice, since January 2015 how often have central/federal ministries/agencies participated in the following events aimed at promoting the re-use of open government data among public servants? - Conduct focus groups/information sessions with public servants to understand their data needs	High/Tailor to purpose
OURdata index	Government support to the re-use/Frequency of information sessions and focus groups for public officials to support	Q.57. a. In practice, since January 2015 how often have central/federal ministries/agencies participated in the following events aimed at promoting the re-use of open government data among public servants? - Send via email an information brief to public servants on new developments regarding open government data policies	High/Tailor to purpose

Index	Indicator	Metric (question)	Relevance/applicability
OURdata index	Government support to the re-use/Conducted or financed research on socio economic impact of open data	Q.65. Do you measure the impact of open government data on public sector performance?	High/Directly applicable
OURdata index	Government support to the re-use/Monitor and promote online initiatives re-using open government data	Q.78. On the central/federal government data portal do you promote initiatives that re-use government data?	High/ Tailor to purpose
OURdata index	Government support to the re-use/Monitor and promote online initiatives re-using open government data	Q.79. For which of the following groups do you promote initiatives that re-use government data? - Public servants	Medium/Tailor to purpose