

# Making Sense of Open Data Policies: a Self-Evaluation Tool for Public Administrations

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*Abstract: The goal of this paper is to put forward a pragmatic approach to the debated question of open data impact assessment, acknowledging the wide agreement on the difficulty to secure a reliable method for objective measurement. The paper addresses the need for a viable method to monitor open data policies through a qualitative evaluation of their impacts on administered territories. To do so, it proposes a tool to help public administrations, especially local governments, to perform such evaluation autonomously and in a quick and simple way, through a questionnaire detecting the perception on the effects produced by shared information, and a form to calculate the overall costs for data management. This self-evaluation activity aims at encouraging internal discussion and information sharing within the administration. The tool was developed and tested in Italy with altogether 12 interlocutors (public administrations and open data experts) and is available to all public organisations.*

*Keywords: open data; open data impacts; impact evaluation; public policy evaluation*

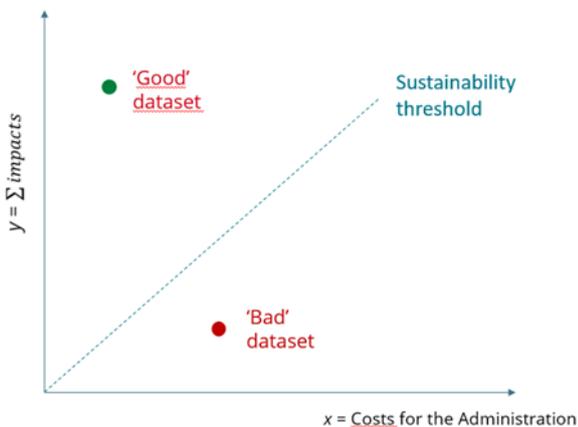
## 1. Research and Operational Goals

The goal of this paper is to put forward a pragmatic approach to the largely debated question of assessing the impacts of open data, acknowledging the wide agreement on the difficulty to secure a reliable method for objective measurement. In fact, if on the one hand the scholarly community faces significant obstacles in establishing a scientifically robust and comprehensive evaluation procedure, on the other hand it is consistent in advising practitioners of the public sector to pursuing policies of openness and information sharing, seeking for a range of diverse benefits. Moreover, even if a comprehensive dashboard of indicators could be provided, the measurement exercise would be too extensive and time consuming for organisations of the public sector to perform it. As a result,

administrations are left to autonomously strategise about opening data, without the adequate means to monitor such policies and make better informed decisions.

The paper aims at addressing this need by proposing a tool to help public administrations, and especially local governments, to perform an evaluation of their own open data policies. We firstly imagined a framework for such evaluation (Figure 1). Drawing from the academic debate on impact categorisation and from the several case studies available in literature, we developed a synthetic indicator to calculate impacts. This measure was then to be weighted against the costs the administrations have to bear to manage (collect, produce, publish) data in an open format ([anonymised for review]). To make this method available, and most importantly usable, for local governments, we designed a tool made up of a questionnaire for detecting the perception of administrations on the effects produced by shared information, and a form to calculate the overall costs for data management. The main goal of this tool is to invite administrations to reflect on their choices concerning data opening by providing them with a simple and rapid evaluation method.

Figure 1: The original framework



## 2. Literature Review

Attempts to calculate an objective measurement of open data impacts are rare and this lack of conceptualisations and methods results in insufficient scientific evidence about the public value behind open data (Jetzek et al., 2019). Even the Open Data Barometer report recognises that evidence of impacts is still inadequate and mostly anecdotal (World Wide Web Foundation, 2018). Dawes et al. (2016) reports and attempt to collect objective measurements carried out by New York City government in 2015 that was however mostly limited to dataset management, rather focusing on their content. Examples of indicators are: number of datasets published, number and percent of existing datasets prioritised and scheduled for release by each agency, number of datasets removed from the portal and reasons for removal. In the same year, the Finnish Ministry of Finance released

a study to invite policy makers to pursue the opening up of public information, solely arguing on expected benefits and acknowledging “measurement difficulties and a lack of statistical or systematically collected information on the use of public data” (Ministry of Finance, 2015). In scientific literature too, it is a widespread practice to evaluate impacts through case studies and theoretical analyses based on qualitative observations. However, the study of such evidence can provide us with a categorisation of benefits, helping practitioners to carry out reflections on open data policies.

Transparency, together with inter-institutional collaboration and civic participation, is a pillar of the open government paradigm and open data are its main component<sup>1</sup>. The achievement of transparency and the boost it gives to the capacity of governments to interact with their external environment is hence considered one of the effects of opening up data (Bertot et al., 2010; Zuiderwijk et al., 2014); but also a means to obtain further effects (Attard et al., 2015; Janssen et al., 2012a), on governmental organisation themselves (internal impacts) or on society as a whole (external impacts). In fact, administrations can use open data as a driver for the planning of new policies or for improving internal processes (Bak et al., 2013). Better processes lead to higher internal efficiency, that together with increased civic engagement enables the administration to better address citizens’ needs (Kassen, 2013). Through the release of public information, citizens have the opportunity to take part to decision-making and policymaking processes becoming effective part of the governance architecture rather than be involved only through electoral procedures (Attard et al., 2016). Not only citizens, but the private sector as a whole can be stimulated (increasing revenues and employment rate) (Abella et al., 2017): Dawes et al. (2016) reports on application developers and data analysts that make use of data in technical formats; Loutas et al. (2012) observed how the majority of open data based services and applications are provided by free-lancers and researchers using a single static dataset; Borzacchiello & Craglia (2012) investigated the effects of spatial data on small and medium enterprises.

Already in 2012 Janssen et al. (2012) proposed a categorisation of impacts, drawing from evidence in literature, organising them in: operational and technical impacts (overlapping with what we identified as internal impacts); political and social impacts; economic impacts. However, the peculiarity of social impact, and the debate about its measurement (see for example Maas & Liket, 2011) suggest to treat it separately, alongside environmental impacts.

### 3. Methodology

The definition of the components and functions of the tool took the form of a “translation” of the original framework, a theoretical product, into a practical, public administration-friendly device. We chose to use an Excel spreadsheet with macro (Microsoft Excel macro-activated worksheet (.xlsm)) developed with Visual Basic Application (VBA) programming language, due to the wide use of Office programmes on the Italian territory, where the tool was tested.

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<sup>1</sup> See <https://www.opengovpartnership.org/>

The tool was tested during 6 interviews with public administrations and open data experts and was sent out for feedback in asynchronous mode to 6 public administrations. This process led to changes in the tool design, the categorisation of impacts, the form of requests of information and the intelligibility of functions and results. The process was iterated to achieve a version of the tool that was considered useful and easy to fill in. Three versions of the tool were then produced: (i) in Italian with valuation of costs in €, for Italian local governments (ii) in Italian with valuation of costs in CHF, for local governments in the Canton of Ticino (CH) (iii) in English, for wider dissemination and future research.

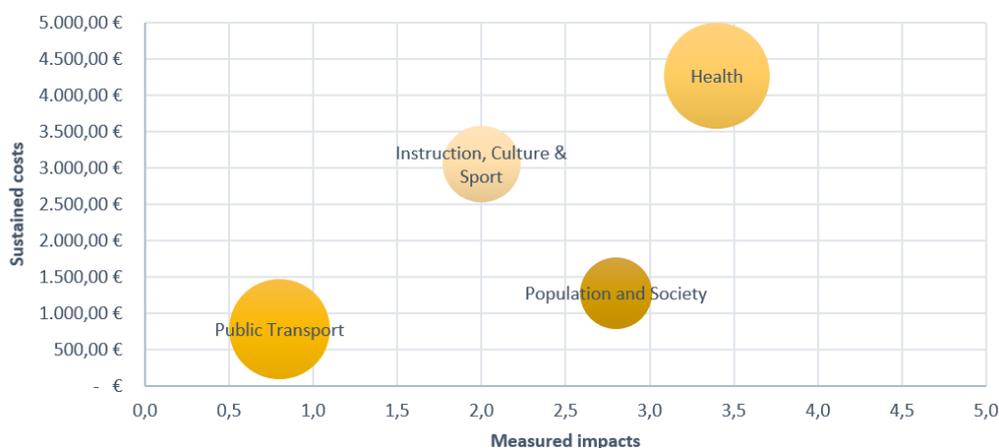
## 4. Designing the Tool

The tool is divided into four different sections, each delimited by a dedicated Excel sheet. Instructions to fill the tool with required information are displayed on each sheet and dedicated buttons facilitate the user.

In the first section ("Landing") the user enters the categories of datasets that the administration publishes and the number of issued datasets for each category. The categorisation of datasets is the one provided by the Italian national agency for digital transformation<sup>2</sup>.

The second section ("Impacts") includes a 15 items questionnaire on perceived impacts, grouped into four thematic areas built upon the categorisation of impacts found in literature and revised through the tests, following the suggestions of interviewed administrations: economic, technical and operational, social and environmental, political and cultural). For each question, respondents can express a qualitative perceptive judgment on a Likert scale basis ranging from 0 to 5, about the extent to which, according to them, the publication of specific categories of data generated impacts. In this section, public administrations are also required to indicate the total number of downloads by category of datasets, as a proxy of uses of such datasets.

Figure 2: Evaluation results: map of dataset categories on the framework



<sup>2</sup> <https://dati.gov.it/>

The third section, "Costs", estimates of the costs sustained for data management. To ease the filling procedure, two different tables were included: one to list general raw costs faced by the administration in the timeframe under analysis, another to quantify the effort in terms of hours spent in each activity of the entire data publication process.

The fourth and final section, "Results", contains a summary of the inserted data and a visual representation of the so completed evaluation on the framework. Three graphs are displayed: a map of dataset categories on the framework (Figure 2), on which the dimension of bubbles varies depending on the number of downloads; a pie chart that shows the breakdown of costs items along all the inserted data categories; a column chart of impacts by thematic area.

To conclude, we believe the proposed tool has the following advantages:

- it has theoretical foundation: the two axes are built on the basis of the results deriving from the review of the literature on impacts and costs.
- it is flexible: the categories of the datasets are not linked in advance to any specific impact. Instead, the user is free to assign any impact value associated with the various questions. Moreover, shall the respondent wanting to evaluate a single dataset instead of the whole category, the "Landing" section provides the possibility to customise an item of evaluation.
- allows ex-post analysis: this is the main purpose of the framework, which intends to allow the analysis of where and how the impacts have occurred and to deduct the importance of each category of datasets. This enables administrations to reflect on the effectiveness of their own open data policies by looking at their overall impact and costs.
- allows an ex-ante analysis: the framework is at the service of administrations for the definition of the expected results in terms of the impacts generated by open data. Nonetheless, it can be used also to make strategic decisions, using the "Impacts" section to specify the objectives the administration wants to achieve.

## References

- Abella, A., Ortiz-De-Urbina-Criado, M., & De-Pablos-Heredero, C. (2017). A model for the analysis of data-driven innovation and value generation in smart cities' ecosystems. *Cities*, 64(April), 47-53. <https://doi.org/10.1016/j.cities.2017.01.011>
- Attard, J., Orlandi, F., & Auer, S. (2016). Value Creation on Open Government Data. In Proceedings of the 49th Hawaii International Conference on System Sciences (HICSS-49) (pp. 2605-2614). IEEE. <https://doi.org/10.1109/HICSS.2016.326>
- Attard, J., Orlandi, F., Scerri, S., & Auer, S. (2015). A systematic review of open government data initiatives. *Government Information Quarterly*, 32(4), 399-418. <https://doi.org/10.1016/j.giq.2015.07.006>
- Bak, T., Almirall, E., & Wareham, J. (2013). N2: A Smart City Initiative : the Case of Barcelona. January 2012, 135-148. <https://doi.org/10.1007/s13132-012-0084-9>

- Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly*, 27(3), 264–271.
- Borzacchiello, M. T., & Craglia, M. (2012). The impact on innovation of open access to spatial environmental information: A research strategy. *International Journal of Technology Management*, 60(1–2), 114–129. <https://doi.org/10.1504/IJTM.2012.049109>
- Dawes, S. S., Vidiyasa, L., & Parkhimovich, O. (2016). Planning and designing open government data programs: An ecosystem approach. *Government Information Quarterly*, 33(1), 15–27. <https://doi.org/10.1016/j.giq.2016.01.003>
- Janssen, M., Charalabidis, Y., & Zuiderwijk, A. (2012a). Benefits, Adoption Barriers and Myths of Open Data and Open Government. *Information Systems Management*, 29(4), 258–268. <https://doi.org/10.1080/10580530.2012.716740>
- Janssen, M., Charalabidis, Y., & Zuiderwijk, A. (2012b). N1: Benefits, Adoption Barriers and Myths of Open Data and Open Government\* Marijn Janssen, Yannis Charalabidis & Anneke Zuiderwijk. *Information Systems Management*, 29(4), 258–268.
- Jetzek, T., Avital, M., & Bjørn-Andersen, N. (2019). N146. The sustainable value of open government data. *Journal of the Association for Information Systems*, 20(6), 702–734. <https://doi.org/10.17705/1jais.00549>
- Kassen, M. (2013). A promising phenomenon of open data: A case study of the Chicago open data project. *Government Information Quarterly*. <https://doi.org/10.1016/j.giq.2013.05.012>
- Loutas, N., Varitimou, A., Peristeras, V., & Galway, N. U. I. (2012). Unraveling the mystery of Open Government Data Apps. Using Open Data: Policy Modeling, Citizen Empowerment, Data Journalism (PMOD 2012), 1380.
- Maas, K., & Liket, K. (2011). Social Impact Measurement: Classification of Methods. [https://doi.org/10.1007/978-94-007-1390-1\\_8](https://doi.org/10.1007/978-94-007-1390-1_8)
- Ministry of Finance. (2015). The Impact of open data – a preliminary study.
- World Wide Web Foundation. (2018). Open Data Barometer. From Promise to Progress.
- Zuiderwijk, A., Janssen, M., & Davis, C. (2014). N11. Innovation with open data: Essential elements of open data ecosystems. *Information Polity*, 19(1–2), 17–33. <https://doi.org/10.3233/IP-140329>

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