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Promoting the use of open government data: Cases of training and engagement

Mila Gascó-Hernández^{a,b}, Erika G. Martin^{b,c}, Luigi Reggi^b, Sunyoung Pyo^b,
Luis F. Luna-Reyes^{a,b,d,e,*}

^a Center for Technology in Government, University at Albany, Albany, NY, USA

^b Department of Public Administration & Policy, University at Albany, Albany, NY, USA

^c Rockefeller Institute of Government, Albany, NY, USA

^d Department of Information Science, University at Albany, Albany, NY, USA

^e Universidad de las Americas Puebla, Mexico

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ABSTRACT

In the last decade, governments around the world have created open government data (OGD) repositories to make government data more accessible and usable by the public, mostly motivated by values such as improved government transparency, citizen collaboration and participation, and spurring innovation. The basic assumption is that once data are more discoverable, accessible, available in alternative formats, and with licensing schemes that allow free re-use, diverse stakeholders will develop innovative data applications. Despite OGD's potential transformative value, there is limited evidence for such transformation, particularly due to scarce data use, which is partly attributable to the lack of technical skills and user training. To advance the dialogue around methods to increase awareness of OGD, improve users' skills to work with OGD, and encourage data use, the paper compares and contrasts how three training interventions in Spain, Italy, and the United States have sought to increase awareness of OGD, improve users' skills and potentially engage them in their use of OGD. We report three main findings. First, introduction and analysis skills are taught in combination to encourage use of open data. Being aware of OGD and its benefits is insufficient to promote use. Second, OGD training seems to be more effective when complemented with knowledge about context and interactions with government. Finally, embedding the training interventions in the specific contexts and considering the unique characteristics, interests, and expectations of different types of users is critical to success.

1. Introduction

In the last decade, governments around the world have created open government data (OGD) repositories to make government data more accessible and usable by the public. The OGD movement has been motivated by values such as improved government transparency, citizen collaboration and participation, and spurring innovation (Harrison, Pardo, & Cook, 2012). The basic assumption is that once data are more discoverable, accessible, available in alternative formats desired by multiple users, and with licensing schemes that allow free re-use, diverse stakeholders will develop innovative data applications (Chan, 2013; Janssen, Charalabidis, & Zuiderwijk, 2012). Within the public sector, OGD has been associated with three main democratic activities: monitoring government actions to promote transparency and accountability; deliberating and discussing policy alternatives; and participating and collaborating in the design, implementation, and

evaluation of government services (Baldwin, 2014; Ruijter, Grimmelikhuijsen, & Meijer, 2017). Outside the public sector, OGD can potentially increase economic growth through the development of sustainable data-driven innovations (Baldwin, 2014; Grant, 2016; Susha, Grönlund, & Janssen, 2015).

Although it is common to attach a transformative value to OGD, there is limited evidence for such transformation, particularly due to scarce data use (Martin, 2014). The OGD movement has been primarily a supply-driven initiative, spurred by the new availability of datasets and other potentially valuable information resources (Ohemeng & Ofosu-Adarkwa, 2015; Styrin, Luna-Reyes, & Harrison, 2017). However, current research suggests that data use is scarce, there is limited involvement of non-profits, and the direct participation of citizens is almost non-existent (Safarov, Meijer, & Grimmelikhuijsen, 2017; Styrin et al., 2017). Furthermore, there are only isolated efforts to understand the characteristics of OGD users, such as their intended use, skills and

* Corresponding author at: Department of Public Administration & Policy, University at Albany, Albany, NY, USA.
E-mail address: lluna-reyes@albany.edu (L.F. Luna-Reyes).

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expertise, and types of tasks they desire to perform with the data (Graves & Hendler, 2014; Martin & Begany, 2017a; Susha et al., 2015).

There are several factors that influence the use of OGD (Janssen et al., 2012; Martin, Law, Ran, Helbig, & Birkhead, 2017; Susha et al., 2015). Limited technical skills is an important barrier (Graves & Hendler, 2014; Lyon et al., 2015; Safarov et al., 2017): most users lack the skills required to assess the quality of the data and its fitness to use, and awareness of what they can do with the data. Although user training is a critical component of facilitating OGD use, there is limited research on strategies to train diverse users. A major challenge is that as OGD portals expand the number and variety of users, it is unclear who the new users are and what they desire (Janssen & Zuiderwijk, 2014; Martin & Begany, 2017a; Zuiderwijk, Janssen, & Davis, 2014). To advance the dialogue around methods to train users and improve their data skills, we compare and contrast three training interventions to promote the use of OGD in Spain, Italy, and the United States, discussing how they increased awareness of OGD, improved users' skills and potentially engaged them in their use of OGD. This comparison allows us to explore the process of improving such skills and knowledge, to analyze how this can be accomplished through training and engagement initiatives, and to identify important challenges and useful strategies. To accomplish our objective, the paper is organized in five more sections besides this introduction. The coming section discusses OGD, particularly focusing on users and main challenges in developing user engagement with OGD. The third section of the paper presents our research method and data sources. The fourth section of the paper includes a description of each of the three cases. The fifth section compares how these trainings were implemented, their early results, and key challenges. We finish the paper by summarizing our current progress and pointing to further developments.

2. Literature review

We start this section with a brief introduction to OGD and its main challenges, and we continue with a summary on main users and skills needed to take advantage of OGD.

2.1. Open government data challenges and barriers to use

Open government data is commonly defined as data produced with public resources and made publicly available with a license that allows for re-use and re-packaging in innovative applications (Janssen et al., 2012). Although some definitions of OGD include a requirement to be machine-readable, for other perspectives it is sufficient to have a free use license. OGD practitioners have identified a quality standard based on the degree of data openness, with “five star” OGD being available online, in structured formats, usable in free software packages, with web addresses or other uniform resource identifiers to enable users to locate data, and linked to other data to develop applications (Berners-Lee, 2009; Martin & Begany, 2017b).

Current experiences demonstrate that the OGD movement faces several challenges. A set of challenges is related to the data publication process, including the lack of willingness to open data because of organizational culture and capabilities (Wirtz, Piehler, Thomas, & Daiser, 2016; Yang & Wu, 2016; Zuiderwijk, Janssen, Choenni, Meijer, & Alibaks, 2012), legal and regulatory issues, particularly those related to privacy and security (Janssen et al., 2012; Khayyat & Bannister, 2015; Martin & Begany, 2017a; Styryn et al., 2017; Zuiderwijk et al., 2014; Zuiderwijk & Janssen, 2014), technical challenges, such as the unavailability of a supporting infrastructure to the lack of standards, fragmentation, and legacy systems (Janssen et al., 2012; Lyon et al., 2015; Martin & Begany, 2017a), skills and knowledge gaps among public managers involved in all stages of the data production cycle, from data collection to publication and archiving (Lyon et al., 2015; Martin & Begany, 2017b; Zuiderwijk et al., 2014), and economic factors, which include resources needed by government agencies to curate

and publish the data (Barry & Bannister, 2014).

Although challenges in the publication process constitute key factors to resolve in order to make data available, important difficulties are also experienced on the side of data users inside and outside government (Susha et al., 2015). For data innovators, ensuring sufficient resources and a proper revenue model are key challenges to promoting OGD use (Susha et al., 2015). As data become open to new users, they may not have the required technical skills to download, make sense of and use the data, domain-specific knowledge to understand the data or identify potential uses, or access to infrastructure to get benefits from OGD (Lyon et al., 2015; Martin, 2014). At a very basic level, even data-savvy potential users are not always aware of the existence of OGD as a public resource (Martin, Birkhead, & Helbig, 2015). Yet, skills and technical knowledge are commonly considered basic conditions of OGD use (Safarov et al., 2017) and the most important asset from the point of view of innovators and end users (Graves & Hendler, 2014; Hjalmarsson, Johannesson, Juell-Skielse, & Rudmark, 2014; Susha et al., 2015). Common challenges associated with user knowledge include the lack of knowledge to use or to make sense of the data as well as lack of statistical knowledge (Janssen et al., 2012). The lack of interactive functionalities and user-centered design of OGD platforms has also been identified as a main factor limiting data use (Zuiderwijk, Janssen, & Susha, 2016). Platform characteristics may even involve barriers to access the data, despite being published, for example, by requiring registration or charging a fee (Janssen et al., 2012). The lack of dialogue between data providers and users has also been reported as an important barrier (Martin, Foulonneau, Turki, & Ihadjadene, 2013).

Interestingly enough, there are certain users' challenges that also affect OGD providers. It is the case of information quality, commonly defined as fitness for use (Barry & Bannister, 2014; Helbig, Cresswell, Burke, & Luna-Reyes, 2012; Janssen et al., 2012; Safarov et al., 2017). Data quality is constrained by its completeness, accuracy, and other issues related to its original collection (Martin et al., 2017; Martin & Begany, 2017b). Additionally, OGD is usually collected with specific administrative requirements that are usually very different from those of alternative applications, making re-use, for both providers and users, a challenging endeavor (Helbig et al., 2012). Developing a sustainable business model remains an unsolved problem for both providers and users (Barry & Bannister, 2014; Janssen & Zuiderwijk, 2014).

2.2. Open government data skills and user engagement

As the previous section suggests, one of the key barriers for OGD use is the lack of technical skills and domain knowledge, and previous works have widely recognized the importance of having the appropriate skills to take full advantage of the transformative potential of OGD. There is a literature gap on interventions to improve users' skills and knowledge. The three cases described in our article are a first step towards understanding how different types of interventions increase awareness of OGD, enhance users' skills and, potentially, engage them in the use of Open Government Data. As our cases target different users in alternative contexts, we first review the existing scarce literature on government data users as well as needed skills.

There are multiple users of OGD, and reaching new audiences beyond the traditional users of specific datasets is an important benefit of OGD (Baldwin, 2014; Martin & Begany, 2017a; Safarov et al., 2017; Susha et al., 2015). Fig. 1 illustrates these users and examples of OGD use. Each type of user has different interests and intended use. First, government employees may use the data to improve public services as well as decision and policy making processes (Lyon et al., 2015; Martin & Begany, 2017a). A second category of users is innovators, which include individual programmers and developers as well as established businesses (Grant, 2016; Safarov et al., 2017). They use the data with innovation purposes: usually, these data users develop a new information product or service and commercialize it (Bria et al., 2015). A third type of users encompasses researchers, data journalists, and

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