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Open Data Driven Public Accountability

Abstract

Purpose

To analyse extant literature on open data, distinguish and categorise the strands of public accountability research, and use the results to provide better clarity in the concept of open data driven public accountability.

Design/methodology/approach

Systematic review of 135 open data articles and 155 accountability articles from the E-Government Reference Library (EGRL). A multi-stage analysis results in 12 articles which are categorized using Bovens' (2007) accountability theory of *information*, *discussion*, and *consequences*. Based on the analysis results and literature analysis, conceptual development forms the final section of the paper.

Findings

Research demonstrates a range of open data topics have been advanced. However, just 12 articles exist that simultaneously address open data and accountability theory. Of the total 155 public accountability articles, the preponderant focus is on the information (N = 25) and discussion (N = 7) stages of the accountability process. Just 1 article focuses on the complete accountability process. Addressing this problem, our characterization of open [government] data driven public accountability establishes conceptual crispness and clarity.

Originality/value

Public accountability theory on open government has become overshadowed by social and economic value perspectives. This paper clarifies and moves forward the open data driven public accountability perspective. It takes stock of public accountability research, delimits the key issues and questions, and highlights the next steps needed for developing scholarship.

Keywords: public accountability; open government; open data; e-government; e-democracy; e-participation

1 Introduction

The concept and practice of government transparency is not new. Meijer (2015) analysed the history of government transparency over the past 250 years, using the Netherlands as a case study, and identified two major phases in this process. In the first one, transparency and openness are associated with the possibility of monitoring representatives of citizens in a representative democracy. In the second phase, the emphasis is on participatory democracy, that is, where citizens are provided with the necessary information to “engage on an equal basis with government agencies and officials” (A. Meijer, 2015, p. 196). Meijer (2015) also refers to the Internet revolution as a driving force behind this second phase, which allows for the “widespread availability of government documents on Web sites” (A. Meijer, 2015, p. 196; Table 1). Government transparency is nowadays associated with Internet-driven ICT, the open data movement (Davies, 2013) and with open government portals (Lourenço, 2015). However, there is an inherent problem with the two goals because both objectives may be pursued simultaneously but are not mutually inclusive so there is the risk of one overshadowing the other.

It is also possible to explore the progress of government transparency looking at the evolution of eDemocracy and eGovernment maturity models and, more recently, to the emergence of the concept of Open Government. Early models of eDemocracy focus on eParticipation (also referred to as e-engagement) (Cook, 2002). According to Macintosh (2003), e-engagement includes three objectives: Information online, eConsultation, and eParticipation (i.e. ICT supported active participation). Another recent approach typifies the linear structure of eParticipation levels: e-Inform, eConsult, eInvolve, eCollaborate and eEmpower leading from a “one-way channel that provides citizens with important”, to “placement of the final decision in the hands of the public” (Efthimios Tambouris, Liotas, & Tarabanis, 2007). The eDemocracy models emphasize supporting an informed citizen participation in public decision making and policy-formulation processes. However, again, the role of information provision for public accountability purposes risks being overshadowed by eVoting or eParticipation.

eGovernment maturity models have a similar logic to eParticipation. An early definition says: “E-government refers to the delivery of information and services online through the Internet or other digital means” (West, 2000, p. 1). This initial definition was expanded over the next decade and several eGovernment models emerged during that period. Lee (2010) analysed 12 of such models and, and it is possible to confirm that every one of them included some ‘information’ related stage (such as “web presence”, “info publishing and dissemination”, “catalogue”, or “billboard”), usually associated with the lowest degree of eGovernment maturity, but accountability was not discussed. Most of the upper maturity levels were associated with increasing

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online service sophistication, internal interoperability and integration or, in some cases, with typical eDemocracy stages (namely eParticipation). So, although the initial eGovernment definition considers information and service provision on equal footing, the ensuing maturity models clearly emphasize the role of online service provision. The role of information within these early eGovernment models is overshadowed and seems to be confined to institutional information (opening hours, physical location, mission, ...) and information concerning service provision (regulations, bureaucratic requirements, ...).

More recently, the theory of Open Government has also built upon the core concepts of eDemocracy and eGovernment, such as participation and online service provision, but reinforces the idea and benefits of openness: citizen sourcing in public decision and policy formulation processes; co-production, co-design and collaborative service delivery for social and economic value (Linders & Wilson, 2011). Openness aims to "deliver value to the public by creating additional (and often unanticipated) public-facing applications from that data" (Linders & Wilson, 2011). There is a risk, yet again, that transparency for accountability purposes will be overshadowed by the goal to "generate social and economic value" (Dawes & Helbig, 2010), to "contribute to economic growth and provide social value to citizens" (Kalampokis, Tambouris, & Tarabanis, 2011b).

However, since transparency is a clear objective within Open Government, it gained much more visibility than the previous, related *information* stages of eDemocracy and eGovernment maturity models. But, as transparency within Open Government is closely associated with the open data movement, this risk is reinforced by the possibility of even the simple 'open (government) data' expression losing its accountability related meaning, focusing on the technical aspects of data release rather than on the goal of its release (accountability), blurring "the distinction between the technologies of open data and the politics of open government." (Yu & Robinson, 2012). Also, even when the focus is on public accountability, there is the error of considering accountability as 'simply' equated to transparency. Peixoto (2013) refers to this as "the ambiguity and uncertainty of the link between 'open data' and 'accountability'". Similarly, Nahon & Peled (2015), after analysing the current status of open government data in the US in a systematic and quantitative study, conclude that "the journey from the initial disclosure of public data to implementing open government principles is long."

In sum, the research purpose of this paper can be clearly set out as follows:

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The research *problem* is that the specific Meijer's (2015) theme of monitoring representatives through 'open data driven public accountability' seems to have little autonomy and visibility within the open government and open data research literature.

We seek to address this problem through two research *questions*: 1) how, and to what extent, has accountability been addressed in scholarly research on open data?; and 2) what specifically is open [government] data driven public accountability (its defining characteristics, processes, values, and goals)?

Finally, to those questions, there are thus two corresponding research *objectives*: 1) to rescue the concept of 'open data driven public accountability' from the many risks compromising/shadowing this idea (e.g., 'open data' for economic value, openness for collaborative service delivery, openness for engagement and participation, the technical aspects of open data, transparency as equated to accountability, ...); and 2) to give visibility and crispness to this specific strand of research and practice within the overall theme of open government.

Throughout this paper we will consider the concept of *openness* as used in the United States Open Government Directive (Linders and Wilson 2011), thus encompassing *transparency* of internal operations, *public participation* in decision-making and *collaboration* with stakeholders. We focus on the value of transparency within open government, and we follow Linders and Wilson's (2011) two subgoals of transparency: releasing data for public accountability purposes and the intent to make data publicly available for re-usability purposes. Our research is specifically concerned with transparency for public accountability purposes, in the context of open government.

The paper is organized as follows: In section 2 we perform a systematic review of scholarly literature on open data and accountability, and we discuss the various research interests and topics. In section 3 we draw upon a wider range of theories on accountability and transparency to develop a robust characterization of open data driven public accountability. We conclude with suggestions on how the characterization can be used to guide future research.

2 EGRL analysis

To address our objectives, we started by analysing the references from the E-Government Reference Library (EGRL) in order to answer the question of how, and to what extent, accountability is being addressed in scholarly research on open data.

EGRL is considered to be one of the most comprehensive academic repositories of work on e-government and therefore an ideal source for articles on open data, open government, and public accountability. It regularly compiles eGovernment research

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literature from various sources, including seven core journals and three core conferences, and currently holds 7548 references (version 11).

2.1 Data and methods

The EGRL analysis (N=7548 publications) was divided into two stages. In the first stage, two separate searches were conducted to address the two endpoints of 'open data driven public accountability': one using the 'open data' and 'open government data' expressions; the other using the 'accountability' term. Both searches were made considering all fields in the bibliographic records and excluding books, edited books and book sections, which are the more difficult reference types to obtain and fully analyse. Figure 1 depicts the two sets of publications resulting from this stage.

[FIGURE 1 GOES HERE]

In the second stage, each subset of publications was considered separately.

In the case of 'open data' related publications (N=135), and in the absence of a pre-existing analysis framework to work off, several iterative rounds of analysis led to the creation of five categories. Each category represents one key topic, where all open data related publications were classified. In the end, the major themes were identified and a perception about the relative weight of focus on each theme.

In the second case, a more directed approach was adopted and the three main phases of the public accountability process, *information*, *debate* and *consequences* (Bovens, 2007; Schillemans, Van Twist, & Vanhommerig, 2013), were used as an initial framework for analysis of the 'accountability' related publications (N=155). Apart from the title, keywords and abstract, the full text of a restricted set of publications was also considered in the analysis.

Finally, a separate and more in-depth analysis was conducted on the twelve publications identified in the previous stage as belonging to both sets of publications.

2.2 Findings

2.2.1 Open Data

The first stage search resulted in 135 records found in relation to 'open data', 1.8% of the total number of publications in EGRL. Figure 2 details the evolution of open data related publications since 2000.

[FIGURE 2 GOES HERE]

According to the EGRL, open data related publications have been non-existent from 2000 until 2009, and the first one dates back to 2010. Since then there has been a sharp rise in the number of publications, and in 2014 (the last complete year covered

Rui Pedro Lourenço, Suzanne Piotrowski, Alex Ingrams, (2017) "Open data driven public accountability", *Transforming Government: People, Process and Policy*, Vol. 11 Issue: 1, pp.42-57, <https://doi.org/10.1108/TG-12-2015-0050> by EGRL at the moment) open data related publications accounted for 7.7% of all publications.

Several rounds of analysis of all 135 publications' abstracts resulted in five classification categories, representing five different main research focuses, which were used to characterize all 135 publications.

Although an effort was made to assign each publication to a single category, in some cases a publication was assigned to more than one category, according to its abstract. Only one publication was found completely off-topic despite the usage of the open data term. Overall, it seems none of the topics is significantly more relevant than the others.

The *focus on pre-conditions* category of publications (N=36) addresses the initial phase of open data projects. The *focus on data* category (N=27) is broken into three main parts: 1) Before being disclosed, data needs to be collected, managed and selected; 2) the technical aspects and intrinsic characteristics of the data being disclosed; and 3) and conceptual discussions about the meaning of open data. The third category *focuses on platforms, infrastructures, and applications* (N=39). The *focus on context* of open data disclosure (N=26), namely existing and proposed policies, guidelines and overall analysis is the fourth category. This category is broken up into 1) historical and conceptual and 2) Open Data and Open Government Policies.

Focus on purpose, actual or intended usage, and feedback is the fifth and final category (N=34). Almost every publication refers, in general, to one or more purposes or intended usages for open data. However, the publications considered in this section were selected because they specifically address one major purpose. One of the most referred to intended purposes for open data concerns is open social and economic innovation, which is considered a major goal for open government. Another intended purpose addressed by these publications concerns open data efforts to support citizen participation, engagement and collaboration, and to improve public governance and policy modelling. The third major purpose for opening data identified has to do with transparency and public accountability.

2.2.2 Public Accountability

The first stage search resulted in 155 records found in relation to 'accountability', 2.1% of the total number of publications in EGRL. Figure 3 further details the evolution of accountability related publications since 2000.

[FIGURE 3 GOES HERE]

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Accountability related publications have been steadily rising since 2008, after a relative decline between 2000 and 2008. This is an indication that interest in accountability is growing within eGovernment research in the last few years.

The analysis of the abstract of these 155 publications resulted in excluding those:

- a) Whose core subject was not related to accountability, transparency, open government or data disclosure (70 publications);
- b) Addressing accountability, but from a conceptual point of view, focusing on obstacles and risks, factors and determinants, or effects of transparency and accountability, for instance (42 publications).

From the remaining publications, ten were not considered for further analysis due to the fact that they could not be retrieved and therefore it was not possible to examine them in more detail.

The analysis proceeded with the full text of each one of the remaining 33 publications based on the three phases of the public accountability process: *information*, *debate* and *consequences* (Bovens, 2007; Schillemans et al., 2013). Figure 4 depicts the distribution of publications among these phases.

[FIGURE 4 GOES HERE]

Among the initial 33 publications, eight were deemed as not directly related to the public accountability process as it is considered here. This brought the total number of relevant publications analysed down to 25. Seven publications explicitly address the *debate* and *discuss* phase of public accountability process. As expected, all 25 publications considered at this stage address the public accountability process *information* phase.

Noticeably, only one publication seems to explicitly address the entire public accountability process, including the *debate* and *consequences (sanctions)* phase, originating in data disclosure (Cho & Choi, 2004). Nevertheless, in the accountability process described, the *information* phase does not correspond to an open data initiative (base on an open data portal or online database), but rather from a “web-based internet service to transact civil applications” which allows for anyone to “monitor the status of the applications in order to track the progress of the review and approval processes” (Cho & Choi, 2004). Therefore, this publication does not correspond to an ‘open data driven public accountability’ process as considered here.

A separate, complementary, analysis was made of these twenty-five (N=25) in regard to the several media types and formats considered, explicitly and implicitly, as the main source of disclosed data/information. Among the twenty-five publications addressing the stages of the public accountability process, only eight (N=8) referred to

Rui Pedro Lourenço, Suzanne Piotrowski, Alex Ingrams, (2017) "Open data driven public accountability", *Transforming Government: People, Process and Policy*, Vol. 11 Issue: 1, pp.42-57, <https://doi.org/10.1108/TG-12-2015-0050> online databases (A. J. Meijer, 2003), online public records (Munson et al., 2011) and data portals (e.g. (Lourenço, 2013b)) as data sources in the *information* phase, thus corresponding to an 'open data driven public accountability' process as considered here. The remaining publications were either associated with more 'traditional' ways of transparency, namely those including the disclosure of documents or the availability of website embedded information (N=5), social media-generated unstructured data (N=5), or eGovernment, eServices and other applications (N=7).

2.2.3 Open Data and Public Accountability Concurrently

Among all 135 publications using the expression 'open data' within EGRL, only 12 were also included in the set of 155 publications using the expression 'accountability' (see Figure 1). The question remains whether these publications, by simultaneously using both expressions, really address the whole public accountability process started and driven by Open [government] Data.

One publication (Francoli & Clarke, 2014) targets 'open government' definitions across seven Open Government Partnership members, and the way expressions such as 'open data' and 'accountability' are used and defined in those policy documents. Other, mainly conceptual publications (Misuraca & Viscusi, 2014; Ngwenya, Lubbe, & Klopper, 2010), analyse how different social, political, and economic contexts, and country attitudes towards Open Government and might influence open government development. These publications, while having a clear conceptual focus, do not address the entire open data driven public accountability process.

Another set of publications is clearly focused on the initial stages of the whole public accountability process, namely that concerned with data disclosure. This includes assessing in a systematic way the status of open federal data in the US and whether it complies with open data policies and stated objectives (Nahon & Peled, 2015), analysing the "bottlenecks and actual practicality of opening data to the public domain" (Hartog, Mulder, Spée, Visser, & Gribnau, 2014a, 2014b), or formulating a quality-based framework for open government data compliance assessment (Viscusi, Spahiu, Maurino, & Batini, 2014). In all those cases, public accountability is usually only referred to as a global context or general goal of open government (among others). However, two other publications (Lourenço, Sá, Jorge, & Pattaro, 2013; Lourenço, 2013b) while still focusing mainly on data disclosure, expressly consider it as the initial step for supporting public accountability.

Finally, the remaining publications (Capuano, 2014; dos Santos Brito, dos Santos Neto, da Silva Costa, Garcia, & de Lemos Meira, 2014; González, Garcia, Cortés, & Carpy, 2014) describe different types of applications designed to enhance transparency by providing different and more sophisticated data visualization tools based on available

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open data. In these cases, while public accountability might be considered as the ultimate goal, the emphasis is solely on transparency, the initial stage of the whole process. In a sense, we might consider that transparency' and 'accountability' are somehow viewed as being equivalent, and the stages of *discussion* and *consequences* are not specifically addressed.

Our analysis of the status of the concept of open [government] data driven public accountability found that its definition and salience in research until now has been severely wanting. The risks of being overshadowed come mainly from other important areas of open government research such as open social and economic data and e-participation, which nevertheless have hitherto dominated core open government interest at the expense of perspectives on public accountability. This situation contrasts markedly with the oft repeated claim that accountability is a core goal of open data and open government (e.g., Bovens, 2007; Meijer, 2015; Yu & Robinson, 2012). It begs the question of exactly what then are the characteristics of open [government] data driven public accountability?

3 Open [government] data driven public accountability

The analysis presented so far provides an overview of the main research interests and topics associated with 'open [government] data driven public accountability', and helps to identify and understand the nascent body of literature that we can build upon. From this analysis it is possible to establish the foundations and characterization of the 'open [government] data driven public accountability' concept and expression, and therefore to rescue it from the risks that may overshadow this particular strand of research and practice.

To clarify 'open [government] data driven public accountability', and associated concepts, in this section we first describe the detailed tasks and phases of the public accountability process, and second we present a characterization of the open [government] data driven public accountability perspective by describing several of its theoretical and philosophical tributaries.

3.1 The public accountability process and tasks

According to the concept of accountability used by Bovens (2007), public accountability consists of a *forum* (citizens and civic actors such as NGOs, the media, and courts) and *actors* (public, elected representatives and appointed officials). Lourenço, Piotrowski, and Ingrams (2015) analyzed detailed sequential actions and events involved in the relationship of the actor(s) and forum(s) in the public accountability process and developed a 3-stage accountability task framework

Rui Pedro Lourenço, Suzanne Piotrowski, Alex Ingrams, (2017) "Open data driven public accountability", *Transforming Government: People, Process and Policy*, Vol. 11 Issue: 1, pp.42-57, <https://doi.org/10.1108/TG-12-2015-0050> involving: a decomposition of the tasks of the accountability process (Stage 1); a categorization of those tasks into abstract data patterns based on the affordances of several kinds of ICT (Stage 2); and finally a combination of the tasks and patterns into a "comprehensive public accountability support platform" (Stage 3).

[FIGURE 5 GOES HERE]

Figure 5 shows the abstract task patterns that were developed in Stage 2. Here, they are grouped using a Venn diagram into the three phases developed in Stage 1 of the accountability process, *information disclosure, debate and discussion, and consequences*. Following Task-Technology Fit (TTF) theory, the next step involved in the open data-driven public accountability process involves the analysis of the tasks of the accountability process and their classification into abstract steps that suggest certain group collaboration patterns. Further, the collaboration patterns can be used to support specific technological solutions (Lourenço, Piotrowski, and Ingrams, 2015)

3.1.1 Information

As shown in Table 1, the accountability process begins with the phase of information disclosure that includes tasks such as addressing information rights/demands, sourcing third party sources of data and disclosing information for re-usability in the voluntary data [1], requested data [2], and data from other sources tasks [4]. The information disclosure phase also includes ensuring data quality and suitability through politically relevant data selection and the distribution of data to increase its visibility [5]. The latter task relies on proactive governmental support for a free press and broad internet access.

[TABLE 1 GOES HERE]

3.1.2 Debate/Discussion

In the second stage (see Table 1), debating and discussion, data is processed and merged in meaningful ways that requires input from civil society and other members of the forum [6]. Next the forum reaches a shared understanding of accountability problems that emerge from the processing of data [7], and the further task of identifying and interrogating relevant actors in order to turn transparency into accountability [8]. The actors here respond by explaining and justifying their behavior [9].

3.1.3 Consequences

In the third stage (see Table 1) the accountability process moves into tasks involving consequences for the actors that have been identified and have given explanation [10]. At this stage all the relevant information has been considered and discussed/debated

Rui Pedro Lourenço, Suzanne Piotrowski, Alex Ingrams, (2017) "Open data driven public accountability", *Transforming Government: People, Process and Policy*, Vol. 11 Issue: 1, pp.42-57, <https://doi.org/10.1108/TG-12-2015-0050> and a judgement is reached on the actors' behaviour(s) [11 (a – f)]. Sanctions are selected and applied in six different ways: (a) Negative publicity which involves an indirect consequence through making the actors actions visible through media collaboration; (b) Seeking legal sanctions, another indirect sanctioning mechanism, this time involving the court system; (c) Influencing supervisory or sanctioning bodies, which can be influenced through petitions or research support; (d) Influencing the hierarchy within or outside the actor's organization an encouraging the application of fines, budget cuts, or other organizational protocol; (e) Influencing political and electoral sanction where 'blame and shame' is leveraged for voters, political parties, and campaign donors; and (f) Influencing participative forums that the actor is involved in by leveraging the forum's data and hierarchy.

3.2 Open [government] data

What do we mean by 'open' in this context? To be used in and drive a public accountability process, data must be open that is, it should be:

"freely used, re-used and distributed by anyone, only subject to (at the most) the requirement that users attribute the data and that they make their work available to be shared as well." (Ubaldi, 2013, p. 6)

Therefore, among the Principles of Open Data (Open Government Working Group, 2007), data shall be considered open if it is complete ("All public data are made available"), timely available ("as quickly as necessary to preserve the value"), accessible ("to the widest range of users for the widest range of purposes"), using non-proprietary formats ("over which no entity has exclusive control"), and license-free ("not subject to any copyright, patent, trademark or trade secret regulation"). Furthermore, the compliance with those principles should be reviewable.

Secondly, what exactly do we mean by 'government'? (Ubaldi, 2013, p. 6) defines government data as "any data and information produced or commissioned by public bodies", including business information, registers, patent and trademark information or geographic information (for example). This definition highlights the term 'government' as an expression of 'who' is responsible for producing the data, directly or indirectly (commissioned), and therefore who 'owns' the data.

A slightly different perspective is discussed by Robinson, Yu, Zeller, & Felten (2009) emphasizing 'who' is responsible for providing the data (to the public), and therefore distinguishing between when "Government Provides Data" and "Private Parties Present Data to Citizens". Both considerations, however, focus on 'who' produces and 'who' delivers data, but do not make any considerations regarding the 'nature' and main purpose of data. Yu & Robinson (2012) contribute to this discussion by highlighting the ambiguity of the term 'open government data': considering 'open

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government' as a unique qualifier for 'data' emphasizes the political relevance of data being disclosed; on the other hand, when considering 'open' and 'government' as separate qualifiers for 'data' "we are talking about data that is both easily accessed and government related, but that might or might not be politically important" (Yu & Robinson, 2012, p. 182).

When we consider that it is the government responsibility to disclose data, instead of "Private Parties" (Robinson et al., 2009), we might still distinguish between two different organizational approaches (Kalampokis, Tambouris, & Tarabanis, 2011a): one where "data belonging to various public agencies is published by the one-stop government data portal"; another where "data belonging to various public agencies is published in a decentralised manner by these agencies (usually in their website) while the portal provides some kind of linking mechanism and/or metadata for the identification of the actual dataset".

Finally, the third part of the term 'open [government] data' is, of course, the "data" part. What do we mean by 'data' in this context? According to the first of the Eight Principles of Open Data (Open Government Working Group, 2007), "data are electronically stored information or recordings, including but not limited to documents, databases, transcripts, and audio/visual recordings". However, according to the same principles, "data are published as collected at the source, with the finest possible level of granularity, not in aggregate or modified forms" (Second Principle - Data Must Be Primary) and "data are reasonably structured to allow automated processing of it" (Fifth Principle - Data Must Be Machine Processable).

The last requirement is further reinforced by Berners-Lee Five Star Open Data Scheme (Berners-Lee, 2010) that distinguishes between making "stuff available on the Web (whatever format)" (Level 1) and make it (at least) available as structured data (Level 2). From then on (upper levels), several format possibilities (Verma & Gupta, 2012) and technological approaches may be used to make data available, including downloadable files and datasets, searchable databases, APIs and Linked Open Data (Evangelos Kalampokis, Tambouris, & Tarabanis, 2011a; Shadbolt et al., 2012). The ultimate goal is to provide structured data that could be easily machine-processed, linked, integrated and analyzed. As such, images, audio/visual recordings or data tables embedded in a textual document (for instance) would not be considered, as such, adequate for 'Open data driven public accountability'. Instead, they could be considered as supporting documents associated with a particular set of structured data, providing context and additional information.

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3.3 An internal (administrative) organisational perspective

Bannister and Connolly (2014) identify two distinct interpretations regarding usage of the term 'value' in the open government data context. The first interpretation, the social and economic value perspective, is associated with "what it [data disclosed] is worth" (Bannister & Connolly, 2014, p. 120), that is, 'the value' of open data. Just releasing this data has no actual value until a new service or product is created from it. The second perspective on open data is the open [government] data driven public accountability perspective. This perspective refers to "a value that is held by people (and can be held collectively by organisations)" defined as "a mode of behaviour, either a way of doing things or an attribute of a way of doing things, that is held to be right" (Bannister & Connolly, 2014, p. 120).

Several types of research in open [government] data driven public accountability perspective affirm the anti-corruption benefits of accountability through ICT technologies (e.g., (Cho & Choi, 2004)), relationship-building through public contracting accountability (Dubnick & Frederickson, 2010), and improved accountability generally (e.g., (Bertot, Jaeger, & Grimes, 2010; Klotz, 2010; Lourenço, 2013a; A. J. Meijer, 2003; Stamati, Papadopoulos, & Anagnostopoulos, 2015)). The case for the social and economic value perspective of open [government] data depends on the external use of data (new products, new services, etc.). In contrast, the 'public sector values' perspective is an internal (public sector) account of open data whereby data disclosure in itself, regardless of actual use by external stakeholders, fulfils one or several public values.

In the public organization, according to Bovens' (2007) there are three different dimensions to this internal accountability: *democratic*, *constitutional*, and *learning*. The democratic perspective concerns the principal-agent relationships between citizens and its representatives. The principals in the democratic system monitor the behaviour of agents and ultimately pass judgement on what the agents do. The constitutional perspective involves a system of checks and balances instated through the constitutional arrangement of decision-making and judgement-passing bodies such as parliaments, the executive, and the courts. Finally, Boven's learning perspective of accountability concerns the use of accountability tools and mechanisms that encourage the government executive to learn how to be accountable through practice. Such organizational learning is produced by strategic, cognitive, and institutional changes driven by multiple parties of actors in administrative settings (A. Meijer, 2013) and from trust-building through accountable contracting arrangements (Dubnick & Frederickson, 2010).

To clarify the meaning of 'open [government] data driven public accountability' we must therefore bear in mind that this refers to the disclosure of "politically important"

Rui Pedro Lourenço, Suzanne Piotrowski, Alex Ingrams, (2017) "Open data driven public accountability", *Transforming Government: People, Process and Policy*, Vol. 11 Issue: 1, pp.42-57, <https://doi.org/10.1108/TG-12-2015-0050> (Yu & Robinson, 2012, p. 182) data, released to allow "external actors to monitor the internal workings or performance" of government agencies (Grimmelikhuijsen, 2011, p. 38). It is therefore associated with the concept of 'inwards transparency', "when those outside can observe what is going on inside the organization" (Heald, 2006, p. 28), including their events and processes (Heald, 2006, p. 30). As such, we may consider that the main purpose of data disclosure in this context is to support public accountability, departing from the purpose of releasing data for its economic valuable data (which would allow the creation of innovative services and products) or even to foster citizens' engagement in public decision-making or policy formulation processes.

3.4 The value of open data and the public value of accountability

Transparency should not be considered as an intrinsic value of public governance, such as fairness and equality (Heald, 2006). However, it is the "public's right to know" and "good governance" ("where the discussion is about ends rather than means"), as Bannister and Connolly contend, that are the actual values/beliefs behind transparency (Bannister & Connolly, 2011). The value of open data targeting public accountability is realised (at least partially) from the moment data is disclosed (assuming it is data concerning the inner works of PA), even if not used (for discussion, sanctions or rewards). Its value originates in the public value of transparency and accountability which is the cornerstone of a fully functional representative system. Political representatives and public officials have the duty to report on their actions even if no one is paying attention.

Bannister and Connolly (2014) present several public sector values categorisations and taxonomies which include, for instance, accountability and openness as principles that should govern public life. Furthermore, the authors propose a taxonomy of public sector values which include transparency and accountability and suggest that the forum for accountability is two-fold as it involves accountability to the government as a duty and accountability to the public as a socially oriented value (Bannister & Connolly, 2014, pp. 123–125). Thus, this kind of open data driven public accountability is characterised by an accountability process taking place through actors in the public organisation and outside in a forum of account holders. Forums are often composed of a collection of civil society organizations (CSOs) (van Zyl, 2014), and they also rely on the type of bureaucratic systems (Wong & Welch, 2004), institutional skills and capacities (A. J. Meijer, 2007), and cultural values of transparency that are in place (Grimmelikhuijsen, Porumbescu, Hong, & Im, 2013).

4 Conclusion

The approach of open data driven public accountability attempts to answer questions raised of the role of government in the accountability process (Robinson et al., 2009)

Rui Pedro Lourenço, Suzanne Piotrowski, Alex Ingrams, (2017) "Open data driven public accountability", *Transforming Government: People, Process and Policy*, Vol. 11 Issue: 1, pp.42-57, <https://doi.org/10.1108/TG-12-2015-0050> and the nature of the open government concept (Yu & Robinson, 2012). Authors have expressed concerns regarding the limits of transparency (e.g., (Grimmelikhuijsen, 2012)) and the critical assessment of governmental openness (e.g., (Bannister & Connolly, 2011)). Transparency and governmental openness, it is argued, can cut both ways, and the attendant costs of enhanced information access through ICT tools must be weighed carefully against the benefits. These authors tend to give too much emphasis to the limits and obstacles to transparency for accountability because their analysis does not give privilege to 'the public value' obtained (which does not necessarily depend on the actual usage of the data by citizens). In this paper we have found that alternative, 'usage', approaches to open data value have been privileged over the value of public accountability in research on open data and accountability between the years 2000 and 2015. As a result, research on the public accountability theory of open government has been overshadowed and lacking in conceptual clarity and cogency.

The work here has attempted to address this problem. Through a systematic review of the EGRL literature, the paper provides a detailed typology of the kinds of research that has been advanced on the topics of open data and accountability. The paper also advances a foundational characterization of open [government] data driven accountability that should be used as a basis for developing research questions for future empirical and theoretical work on the topic of open government. We have argued that the lack of clear conceptual boundaries to the theory open data driven public accountability risks this fundamental aspect of government transparency becoming overshadowed by alternative perspectives that have dominated eGovernment and eDemocracy trends in public administration.

In addressing the broad concerns of public accountability and open government theory, we have had to bypass important practical questions about the specific administrative and technical support that is needed for public accountability. Some scholars have argued that open data applications and extended functionalities should "best be built by private parties" (Robinson et al., 2009). Apart from the discussion of 'who' should be responsible to develop and offer such tools, the analysis of the EGRL library shows several references in the literature to different types of applications developed in association to open data (see section 2). Beside these references, one specific type of tool, social media, seems to gain relevance both in the general context of government (Chun & Luna Reyes, 2012; Mergel & Bretschneider, 2013) and openness, transparency and accountability in particular (Bertot, Jaeger, & Grimes, 2012; Stamati et al., 2015). However, despite these efforts, there is need to associate specific tools with specific tasks of a public accountability process (Lourenço et al., 2015), thus covering the whole process and not just the data disclosure (transparency) stage.

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Benefits of transparency can be both over- and under-estimated because of the complexity of their effects on political, administrative, and social behaviour. Recent research on transparency has already begun to analyse and develop frameworks that account for such issues and limit the release of information (e.g., Bannister & Connolly, 2011; Grimmeliikhuijsen, 2012; Roberts, 2012). Meijer (2003), for example, describes such a process of ICT-based accountability involving the registering, preserving, and retrieving of digital information. Technology-based frameworks such as this are a necessary part of the open [government] data driven public accountability, and future research can build upon such theoretical tools such as affordances theory or task-technology fit theory to establish the technological architectures of accountability at a detailed level. We hope that research on technological architectures of this type will be advanced using multi-disciplinary methods from public administration, information and computer science, sociology, political science, and other vital fields in this area.

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