ACCOUNTING, ACCOUNTABILITY AND OPEN DATA

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A dissertation submitted to the Faculty of Graduate Studies in Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy

Graduate Program in Business Administration

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Toronto, Ontario

July 2023

Abstract

Widely accepted as central components of good governance, accountability and transparency underpin calls for 'open' approaches to organization, including 'open data' (OD). But rhetorical use of these catchwords tends to blur important distinctions – and tensions – between them. This dissertation examines the relationships between open data and accountability in democratic governance, specifically as mobilized within public financial management (PFM) systems. The chapters build on one another to answer two overarching questions. First, how does OD combine with and/or extend existing arrangements for public financial management? And second, (how) does OD deliver on its promise to increase accountability? A combination of qualitative research methods including literature review, theory development, and empirical analysis are employed. The theoretical development draws on accountability and transparency literature to propose a framework that situates OD as both an object and instrument of accountability. This framework provides a theoretical lens through which organizational practices can be studied from an accountability perspective and guides the empirical study of OD in local government presented in this dissertation. Empirical materials including documents, interviews, and observations were gathered following a case study method and analysed to offer two distinct yet complementary views of OD in PFM. First, by adopting a data 'producer' perspective and theorizing OD as an informing practice, the study finds that OD has been adopted as a new type of informing practice and constitutes an aspect of conduct for which organizational actors are accountable. Two transparency orientations – usability and understandability – are identified and used to explain tensions and/or barriers that arise in OD implementation. Second, data 'user' perspectives are considered by theorizing OD as an instrument of accountability used in debating processes. The findings suggest that while there is a clear alignment between 'open' and 'dialogic' principles, OD is at best considered a partial tool that, used dialogically and in combination with other information sources, may encourage dialogic forms of engagement and accountability. Drawing attention to the absence of accounting in the burgeoning field of 'open' practice and research, this dissertation encourages further research at the intersection of accounting, accountability, and open data.

Dedication

To the next generation of scholars and humans. May you draw inspiration from prior efforts. And learn from prior mistakes.

Acknowledgments

per•se•vere (verb)
To continue in a course of action even in the face of difficulty or with little or no prospect of success.

As a marathon runner and a mother, I thought I knew a thing or two about perseverance. But nothing in life has taught me more about perseverance than the journey that has been this PhD. And I am grateful to all those who have helped me along the way. Without you, without question, I would not have persevered.

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Chapter 1: Introduction

"Without scholarship, data are just numbers, stories are just rumors, inspiration is just hope, knowledge is just information and insights are just possibilities" (Oliver, 2010, p. 27)

1.1. Empirical and theoretical interests

"In a new millennia flush with technology that allows us to connect – with a tweet or a text – citizens rightly demand more responsiveness, more openness, more transparency, more accountability from their governments."

– President Barack Obama, 24 September 2014 address to the Open Government Partnership meeting at the United Nations.

Open approaches to organizing have proliferated in the 21st century. With philosophical origins rooted in political and democratic theory and brought to life in the freedom of information (FOI) movement and open-source software communities of the late 20th century, openness has now become a basic expectation for 21st century governance across a wide range of sectors.

In the public sector, open government (OG) is defined as "a multilateral, political, and social process, which includes in particular transparency, collaborative, and participatory action by government and administration" (Writz and Birkmeyer 2015, p. 384). Open data (OD) offers an approach to transparency that translates open principles into organizational practice. Promoted based on economic and socio-political rationales (Ubaldi, 2013) for its ability to unlock the potential of public data, open government data (OGD) initiatives leverage modern technologies for easy sharing and use of data (Linders, 2012).

In line with the now famous declaration by US Supreme Court Justice Louis Brandeis that "sunlight is said to be the best of disinfectants," (1914, p. 92) open data is promoted as a transparency practice that enhances accountability and contributes to broader notions of good governance. Widely accepted as unambiguously virtuous, these ideals are promoted in policy and governance circles worldwide and underlie many organizational initiatives and practices taken up in the name of the open, from local-level or grassroots campaigns to global forums such as the

International Federation of Accountants, Organisation for Economic Cooperation and Development, and United Nations.

In a symbolic commitment to the virtues of transparency, openness, and accountability, President Obama signed the 2009 Declaration on Transparency and Open Government on his first day in office. National and subnational governments worldwide followed suit by joining the Open Government Partnership (OGP), which formed in 2011 and now counts almost one hundred members. As a condition of membership, OGP members endorse the Open Government Declaration in which they commit to "foster a global culture of open government that empowers and delivers for citizens and advances the ideals of open and participatory 21st century government" (OGP, 2011). Fiscal openness, which refers to transparency, participation, and legislative oversight throughout the budget and fiscal cycle, is a key policy area in which 90% of OGP members have made reform commitments (OGP, 2021).

Consistent with political rhetoric in this the 'open' era, Figure 1 presents a view of transparency and accountability that contrasts the idealized 'open' state against its binary opposite, the 'closed' organizational form. Panel A depicts the 'closed' organization wherein the lack of transparency prevents any form of accountability. Panel B shows the ideal-type 'open' organization wherein open organizational practices including (but not limited to) Open Data provide for the release of government information and enables use by citizens to increase public accountability.[1]

But rhetorical and idealized views of OG and OD have been criticized for being naive and simplistic (Ruijer, Grimmelikhuijsen, and Meijer, 2017, Janssen et al., 2012). Despite the growing body of academic research that has been published on the evolution of OG and OD (Attard et al., 2015; Corrales-Garay et al., 2019; Hossain et al., 2016), there remains little empirical evidence to support the normative assumptions and anticipated benefits that underlie OGD research and practice.

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[1] The black box within the Open Government (G) represents the minimal set of closures that are tolerated and/or required for privacy and security reasons. Citizens are reflected in the separate actor group or *accountability forum* denoted C.

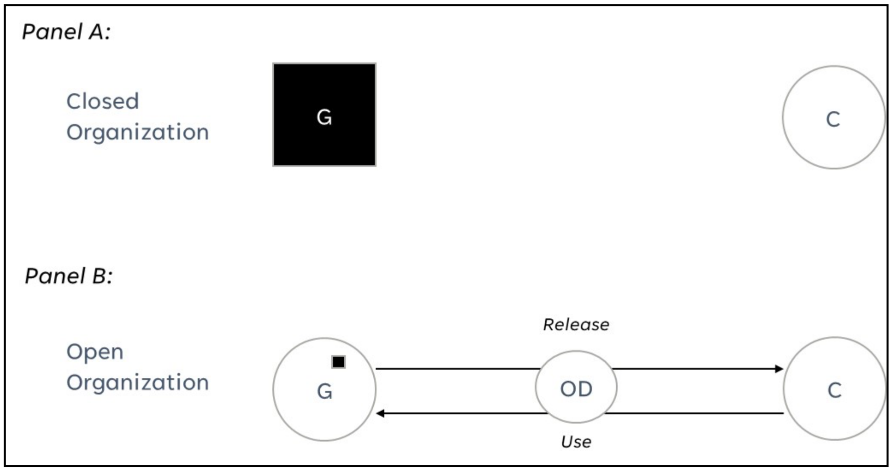

Figure 1: Rhetorical Views of Open vs. Closed Organizations

Transparency and accountability are widely promoted as necessary elements of 'open' organization, required for democratic 'good governance.' Both are pursued as democratic ideals and implemented in administrative practice through 'open' approaches to organization. But the rhetorical view of open vs closed organizations depicted in Figure 1 presents a simplified view that fails to capture the ambiguity of accountability and the varied and partial forms of transparency that characterize everyday organizational practice. While potentially useful as a rhetorical tool to gain buy-in among institutional actors and uptake in stakeholder communities, the view of open organization presented in Figure 1 is of lesser use in understanding the messy process of translating open principles into organizational practice and assessing the resulting outcomes, including those related to public accountability.

In general terms, accountability can be understood as the "articulation of reasons" (McKernan, 2012 p.926) ; it denotes an exchange of reasons for conduct or, with directionality implied, the notion of being answerable to. Transparency refers to the availability of information about an actor that allows other actors to monitor performance (Meijer, 2014) Transparency, it is argued, ensures the release of information which, in turn, provides the basis on which accountability is demonstrated and assessed. But while transparency may indeed contribute to (certain types of) accountability in certain situations and under certain conditions, transparency is not a "miracle instrument" for accountability (Meijer, 2014, p. 521). The literatures on transparency and accountability have variously described them as chameleon, transcendental, and magic concepts (Shenkin and Coils, 2007; Sinclair, 1995, Pollitt and Hupe, 2011) whose potential is often oversold (Etzioni, 2014). As vague and multidimensional constructs, they are used as umbrella concepts to refer to a wide array of phenomena and come to resemble "a dustbin filled with good intentions, loosely defined concepts and vague images of good governance" (Bovens, 2007, p. 449).

1.2. Problematization and research methods

Prior research has considered open data in relation to related administrative practices and policy objectives including freedom of information (Afful-Dadzie and Afful-Dadzie, 2017), public accountability (Lourenço et al., 2017), and democratic impact (Ruijer, Grimmelikhuijsen, and Meijer, 2017). But despite wide recognition that financial transparency is essential for fulfilling public sector accountability (Wang, 2002), little attention has been given to open data as an extension of public financial management (PFM) processes. It is surprising that the accounting perspective is missing from this body research, given the vast amounts of financial data produced by governments and the emphasis on financial and other quantitative performance data in today's OGD movement (Bates, 2014).

Further, it is curious that accounting research has not engaged with this emerging area of administrative practice. Indeed, accounting research has a long history of exploring the calculative, narrative, and visual practices involved in the production, dissemination, and use of financial information. Accounting literature explains the multiple roles of accounting in organizations and society and links accounting to broader managerial and rhetorical practices (Burchell et al, 1980; Walker, 2016; Busco and Quattrone, 2018). Thus, accounting research is well-suited to contribute to theoretically informed empirical analyses of open data initiatives, particularly in PFM. Whereas instrumental views of (open) data follow cause-and-effect relations in which numbers are accepted as neutral representations of reality, accounting researchers have argued that these numbers cannot be separated from their use (Graham, 2008; Vollmer, 2007). Such sociological framings offer a useful starting point to consider user perspectives and the anticipatory effects such consumptive uses may have on open data providers.

1.3. Dissertation outline

Against this backdrop, the original research undertaken for this dissertation explores the relationship between transparency and accountability in relation to public financial management practices in an open government setting. In attempting to bridge the gap between open data and accounting, it aims to contribute to both literatures. The dissertation consists of six chapters. This introductory chapter has set out the topics of theoretical and empirical interest, identifying the gaps in and intended contributions to the extant literature.

Chapter 2 documents the development of the literature on OGD with a view to identify the potential links with accounting research. It follows a structured literature review methodology (Massaro, Dumay, and Guthrie, 2016) to review 271 articles published between 2010 and 2019. The findings reveal a burgeoning area of administrative practice that has been largely overlooked in accounting research. After exposing the disconnect between open data and accounting research, the chapter proposes future research directions that will (i) leverage insights from accounting research to better understand and assess the potential of open data to contribute to public accountability and (ii) encourage accounting research that maintains its close connection to emerging practices in public financial management.

Chapter 3 traces the theoretical foundations of accountability to develop a framework for understanding open approaches to organization, specifically open data, from this perspective. It identifies three parallel perspectives (i.e., virtues, instruments, and contra views) evident in the prior literature on transparency and accountability and draws on Hood's (2010) framings to consider the possible relationships between the two. Building on Bovens' (2007) definition of accountability as an institutional relation, it presents a framework that draws theoretical and analytical attention to seven interrelated elements of accountability. This multi-dimensional framework provides a starting point for theorizing and analyzing open data from an accountability perspective. The chapter concludes by proposing three ways of theorizing open data from an accountability perspective (i.e., OD as *conduct*, OD as *informing*; OD as *debating*).

Chapter 4 is the first of two empirical analysis chapters in this dissertation. Empirically, it provides a producer perspective on open data in relation to PFM, establishing OD as a new aspect of *conduct* for which organizational actors are accountable. Theoretically, it explores the second theoretical proposition set out in Chapter 3 – open data as *informing* practice. Using a case study method (Yin, 2018) to identify and critically examine the variation in administrative practice resulting from the introduction of open data to the City's accountability regime, the empirical analysis aims to disentangle idealized notions of transparency and accountability. It considers the multiple accountabilities faced by individual actors and their differential responses to the same. The analysis strives to see beyond the surface-level unanimity to reveal differential interpretations of 'openness' and of practices taken up in its name. The findings suggest that while actors may agree on 'what' democratic ideals they seek to pursue (i.e., openness, transparency, and accountability), differences arise when tending to the 'how' and 'why' of these policies and initiatives. To conclude this chapter, I present a theoretical model that can be used to situate and compare actors' differential understandings of and approaches to transparency. Illustrative application of the model shows how the seemingly unanimous embrace of transparency and accountability through 'open' policies dissolves when pursued in organizational practice. The differential interpretations of 'open' policies and the varied orientations toward transparency and accountability can lead to alignment and/or dissonance at the same time (depending on the issues and actors involved).

Chapter 5 considers the third theoretical proposition raised in Chapter 3 – OD as *debating* process – in a second analysis of the local government case study data. With a view to to complement the accountability theories on which this dissertation is grounded, I draw on theoretical insights from dialogic accounting (Brown, 2009; Brown and Dillard, 2015) to consider the potential of open data as an instrument of debate in democratic administration. Whereas dialogic accounting (DA) aims to enable a diverse range of societal actors to account for things that traditional accounting ignores, dialogic accounts can be "used for decision-making and accountability purposes, and to foster debate in organizational and civil society settings" (Brown and Dillard, 2015, p. 250). Thus, recognizing the contested nature of accounting information and given open data's defining characteristic as that which can be "freely used, modified, and shared by anyone for any purpose" (Open Knowledge Foundation, n.d.), a dialogic analysis provides a useful theoretical approach to identify and contrast the diverse goals and socio-political factors involved in producing, analyzing, and interpreting public sector accounting information. The dialogic perspective adopted here allows us to question the apparent unanimous embrace of ‘openness’ and examine if and how OGD can deliver on its lofty ideals (specifically with respect to public accountability).

The final chapter concludes and proposes directions for future research to explore the intersection of open data and accounting practice and theory.

1.4. Summary and contributions

Analysis of empirical materials suggests that differential interpretations of ‘open’ policies may contribute to organizational dissonance (Stark, 2009), thus calling into question the apparent unanimity within the ‘open’ discourse. Under certain conditions and in certain situations, transparency may indeed contribute to (certain types of) accountability. But transparency is not a “miracle instrument” for accountability (Meijer, 2014, 521). I argue that the multidimensional nature of transparency and accountability allows myriad pairings to co-exist, providing points of alignment while also creating potential areas of tension and/or dissonance within the organization.

The dissertation makes three contributions. First, it makes a theoretical contribution by confirming the varied and variable relationships between accountability and transparency and integrates them in a framework that provides a basis for theorizing and analyzing open data in relation to accountability. Second, it makes an analytical contribution by proposing a model that can be used to situate and compare the different approaches to transparency to that co-exist within a democratic or ‘open’ administration, thereby providing a conceptual tool that allows us to “speak back” (Tkacz, 2015, p. 281) to openness in specific organizational settings. Third, it makes an empirical contribution by calling into question the apparent unanimity in ‘open’ discourse, offering a possible or partial explanation as to why ‘open’ initiatives fall short of their much-lauded promises. In addition, it highlights the dialogic potential (and threats thereto) of open data, which may shape future efforts to mobilize open data to encourage more dialogic forms of accountability.

Chapter 2: Where is the Accounting? A Systematic Review of OGD Literature

2.1. Introduction

In parallel with the proliferation of OGD initiatives worldwide, research on open data has grown rapidly since 2009. This growing body of academic research has looked at the evolution of OGD policies and related initiatives that have become ubiquitous elements of 21st century administrative practice – their rationales, commonalities, and differences. Unsurprisingly, the research follows a similar trajectory to OGD practice, gaining momentum in the years following president Obama's 2009 Declaration on Transparency and Open Government (Attard et al., 2015; Zhang et al., 2018).

Prior reviews contain useful definitions and conceptual or evaluative frameworks that provide a starting point for understanding the extant research on OGD. They highlight the multidisciplinary nature of the literature, identifying key themes and issues of interest to OGD researchers, tracing the growth of open data, and exploring key approaches, themes and trends in OGD research (Corrales-Garay et al., 2019; Hossain et al., 2016) and practice (Attard et al., 2015).

Indeed, a vibrant research community has formed around open government and open data that has led to publication of research both *on the subject of* OGD (i.e., related policies and practices) and *using* OD (i.e., individual datasets and composite indexes) to explore performance in a variety of policy domains. Researchers have also considered open data in relation to other administrative practices and organizational objectives, including freedom of information research (Afful-Dadzie and Afful-Dadzie, 2017), public accountability (Lourenço et al., 2017), democratic impact (Ruijer, Grimmelikhuijsen, and Meijer, 2017), and 'smart city' governance (Ruhlandt, 2018).

Prior research, however, leaves relevant aspects of OGD research unaddressed, which warrant attention in the current review. Financial transparency, for example, is widely recognized as key in the process of fulfilling public sector accountability (Wang, 2002), however little attention has been given to open data as an extension of public budgeting and financial management processes. While quantitative data is emphasized in the ODG movement (Bates, 2012), accounting research has been relatively silent on topics related to OG and OD. It is notable that the accounting perspective is missing from this body of OGD research, especially given that much of the data being released in open formats and through open data portals is financial in nature. Thus, this literature review seeks to document the development of the literature on OGD with a view to identify the potential links with accounting research and practice – past and future – for further investigation. By identifying the extant research connecting open data and PFM, this review examines public administration and related fields through the lens of accounting and proposes avenues for future research that can leverage accounting insights to enhance our understanding of open data policy.

2.2. Methodology

This review of the OGD literature follows Massaro, Dumay, and Guthrie's (2016) structured literature review (SLR) methodology, which has been promoted in the accounting literature as a means of synthesizing prior research and identifying future research paths. A literature review protocol was developed to clarify the rationale and specify research questions with a view to provide insight, critique extant literature, and identify future research paths. Adapting the three standard SLR questions (i.e., inquiry, critique, future directions) to the field of study under review led to the following three research questions:

> *RQ1. How has the literature on open government data developed over the first decade of practice?*
>
> *RQ2. What is the focus of open government data research?*
>
> *RQ3. What are the future opportunities for open government data research?*

In answering these questions, the article pays particular attention to existing and potential links to accounting research. It establishes the main trends in OGD research and considers the possibilities for accounting research to contribute to – and learn from – this growing area of public policy and administrative practice.

Literature search & article selection

Given the objective to review open government data as an emerging field of research, the initial search parameters were intentionally broad. A keyword search was performed in the

Scopus database for the terms “open data,” and “open government data,” as well as variations of a financial nature including “open budget,” and “open spending.” Search results were then filtered to limit the review scope to public administration, financial management, and related fields. Full bibliographic details were downloaded from the Scopus database and the following inclusion criteria were applied:

IC1. Publication outlets

IC1a. Top publication outlets

IC1b. Accounting and public financial management journals

IC2. Citation Counts

IC2a. Total citations

IC2b. Citations per year

All articles published in top publication outlets and accounting and PFM journals were included in the review to capture the entirety of the mainstream research on OGD as well as the related work in financial disciplines. Top *publication outlets* were defined as journals with ten or more publications in the period and include five journals (listed in Table 3), which collectively published 49% of the work reviewed. *Accounting, public financial management & related* journals contributed only 5% of the research reviewed.

Given the multidisciplinary nature of OGD research, highly cited articles published in other disciplines were included based on *citation counts.* As a starting point, articles with total *citation count* of ten citations for articles published in the first half of the period or five citations for articles published in the second half of the period were included. To capture recently published work, a *citations per year* (CPY) threshold of five citations since the year of publication were also included.

Combined, application of the four inclusion criteria resulted in a final set of 271 articles published in 105 different journals in the decade under review, increasing from a single article published in 2010 to a peak of sixty-three articles in 2017.[2]

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*	Total
Articles	1	5	5	17	32	44	40	63	36	28	271
Publication Outlets	1	5	5	15	15	26	25	36	18	6	105
Average articles per outlet	1	1	1	1	2	2	2	2	2	5	3
Maximum articles per outlet	1	1	1	2	9	10	12	11	14	14	14

Table 1: Summary of Articles Reviewed by Year

Analytical procedure

Full text versions of the selected articles were downloaded in PDF format and added, along with full citation details, to a Mendeley database. Each article was analyzed and coded in an Excel database using a modified version of Dumay, Guthrie, and Puntillo's (2015) analytical framework, as presented in Table 2. *Article type* was added to the coding framework to differentiate the overall methodological orientation from the specific *research methods* and, thus, enable a more detailed analysis of the various methodologies employed and their different purposes. Likewise, empirical methods were coded using discreet categories for a more fine-grained analysis of the results. The *focus of the article* was coded using emergent codes to group articles on similar topics.

A certain amount of overlap between categories/codes was evident, particularly where authors employed more than one research method or addressed interrelated topics. Authors sometimes used a combination of methodological approaches in a single article, for instance using a preliminary case study or survey data to illustrate the application of their proposed theoretical or methodological framework. In such cases, coding was based on the article's primary type, methods, or focus.

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[2] As the literature search was performed in August 2019, the results shown for 2019 include only six months of data. This is indicated by an Asterisk (*) in the results tables.

	Articles	%		Articles	%
A. Publication outlets			**D. Article type**		
Top publication outlets	133	49%	Empirical	148	55%
Accounting & PFM journals	14	5%	Theoretical/Conceptual	50	18%
Other	124	46%	Commentary/Policy	33	12%
Totals	271	100%	Methodological	29	11%
			Literature review	11	4%
			Totals	271	100%
B. Location			**E. Research methods**		
Europe	67	25%	Case study	63	23%
Asia	38	14%	Other Qualitative	54	20%
North America	35	13%	Survey	25	9%
Africa	7	3%	Other Quantitative	34	13%
Australasia	7	3%	Mixed/Multi-method	16	6%
South America	6	2%	Other/Unspecified	79	29%
Multiple	44	16%	Totals	271	100%
Unspecified	67	25%			
Totals	271	100%			
C. Jurisdiction			**F. Focus of the article**		
Central government	70	26%	Open Government/Open Data	138	51%
Local government	65	24%	(Smart) Cities	29	11%
Regional government	7	3%	e-Government	26	10%
Multiple levels	19	7%	Data	13	5%
Other	4	1%	Pubilc Financial Management	31	11%
Unspecified	106	39%	Transparency	16	6%
Totals	271	100%	Other	18	7%
			Totals	271	100%

Table 2: Analytical Framework

2.3. Analysis

This section presents the primary results of the literature review to respond to the first two research questions: first, how has the literature on open government data developed over the last decade? and, second, what is the focus of OGD research? Raw article counts, shown in Table 2 are discussed, along with additional tables that illuminate interesting trends over the decade under review.

.	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*	Total
Panel A: Top publication outlets		**1**	**1**	**3**	**21**	**16**	**16**	**31**	**22**	**22**	**133**
Government Information Quarterly		1		2	6	10	12	11	14	14	**70**
Information Polity			1	1	4	3	2	6	1	6	**24**
International Journal of Electronic Government Research					1			5	5		**11**
Journal of Theoretical and Applied Electronic Commerce Research					9			1	1		**11**
Transforming Government: People, Process and Policy					1	3	2	8	1	2	**17**
Panel B. Accounting & public financial management journals				**1**		**2**	**1**	**2**	**3**	**5**	**14**
Australian Accounting Review						1					**1**
China Journal of Accounting Studies								1			**1**
Financial Accountability and Management									2	1	**3**
Journal of Emerging Technologies in Accounting							1		1		**2**
Journal of Public Budgeting, Accounting and Financial Management								1			**1**
Public Budgeting and Finance						1					**1**
Public Money and Management				1						4	**5**
Panel C: Other publication outlets	**1**	**4**	**4**	**13**	**11**	**26**	**23**	**30**	**11**	**1**	**124**
Total	**1**	**5**	**5**	**17**	**32**	**44**	**40**	**63**	**36**	**28**	**271**

Table 3:Articles by Publication Outlet

Publication outlets

The literature showed significant growth in the decade under review, both in terms of the raw number of articles published as well as the number of journals in which OGD research appears. Even a cursory review of the 271 articles based on article title and/or journal name alone, points to the multidisciplinarity of the research, with articles appearing in 105 different publication outlets (i.e., journals) in the review period.

One hundred of the 105 journals included in the review collectively published half (51%) of the OGD research reviewed. The diffusion of OGD research across research domains – ranging from transport policy to space policy and anthropology to archaeology– is a reminder of the broad applicability of open data policy. As a philosophical approach to information sharing, open data policies can be implemented in any domain of administrative practice, increasing the availability of data and, thus, fuelling research in those areas.

In the first half of the decade, OGD research appeared in journals across fields including political science and international development, public policy and administration (including public financial management), and information systems and technology. By 2014 the research conversation on OGD began to consolidate in the top publication outlets listed in Panel A of Table 3. Collectively, these five journals published 133 articles, or roughly half (49%) of the total research reviewed. *Government Information Quarterly,* with its focus on the intersection of policy, information technology, government, and the public, is the leading publication outlet for OGD research. It has consistently published the most articles annually and, as a result, has contributed more to the OGD research than the next four publication outlets combined, as shown in panel A of Table 3.

Given this review's objective to identify the links between OGD and accounting research, accounting and public financial management journals are listed separately in panel B of Table 3. These journals published a cumulative total of only fourteen articles in the review period. These articles tend to touch tangentially on topics related to OGD, for instance in considering public sector expenditures and national budget systems (Hudspeth et al. 2015; Menifield et al. 2017) and the role of public sector audit (Cordery and Hay 2019; Bunn, Pilcher, and Gilchrist 2018; Heald 2018). Dai and Li (2016) invoke the archetype of "armchair auditor" (O'Leary 2015) to explore the possibility that citizen apps may be used to analyze open government procurement data.

These contributions notwithstanding, the literature reviewed in this study shows little engagement from the accounting research community on topics related to open government and open data. This is surprising given that accountability is a key objective of OGD, and accounting research has produced a significant volume of research on accountability and accounting's central role in accountability systems. It is interesting to note, however, that articles appear in three consecutive issues of *Public Money & Management* in 2019, including within thematic issues on information sharing (Jamieson 2019; McLoughlin et al. 2019) and innovations in public sector financial and management accounting (Jarno, 2019), which may suggest that researchers in this field are starting to consider previously unexplored OGD topics.

It is also worth noting that the articles included in the 'specialty' (i.e., accounting and PFM) journals listed in panel B of Table 3 represent only one-third of the articles published on topics related to PFM. Two-thirds of the research that considers OGD in relation to PFM topics appears in journals covering broad subject areas, such as public policy, political science and international development. In total, twenty-five journals are identified as publishing OGD research on PFM topics. It is also interesting to note that the top OGD publication outlets listed in panel A published only three articles on PFM topics in the decade under review. These contributions to the mainstream OGD literature explore the dimensions and contextual factors impacting online financial transparency (Puron-Cid and Rodríguez Bolívar, 2018), the role of intermediaries for budget transparency (da Silva Craveiro and Albano, 2017), and political and institutional variables that predict fiscal transparency, participation, and accountability in relation to the national budget (Harrison and Sayogo, 2014).

Location and jurisdiction

OGD research shows a relatively even split between the central and local levels of government, each representing about 25% of the articles published. Only a small number of studies consider open data at the regional level, which is to be expected given that some countries, such as the United Kingdom, do not have a regional (i.e., state/provincial) level of government. Other studies consider OGD in specific types of public sector organizations (e.g., the judicial branch, heritage institutions), community or other non-governmental groups (e.g., civic technologists, journalists), and private sector organizations.

Europe represents the most significant location for OGD research, representing 25% of the total research published in the last decade, followed by Asia and North America. While relatively few articles consider the experience in Africa, Australasia, and South America, authors often adopt a comparative perspective that includes multiple locations in a single analysis. The geographic location and level of government is not explicitly stated for 25% and 40% of the studies published, respectively. This research consists mainly of literature reviews or theoretical/methodological articles and/or studies investigating individual-level phenomenon for which location and level of government are not particularly relevant units of analysis.

.	Africa	Asia	Australasia	Europe	Multiple	North America	South America	Unspecified	Total	Total (%)
Central government	5	15		17	20	12	1		**70**	26%
Local government		11	3	21	4	13	2	11	**65**	24%
Regional government	1	1		2		2	1		**7**	3%
Multiple levels		3	2	6	2	1		5	**19**	7%
Other				1		1	1	1	**4**	1%
Unspecified	1	8	2	20	18	6	1	50	**106**	39%
Total	**7**	**38**	**7**	**67**	**44**	**35**	**6**	**67**	**271**	100%
Total(%)	3%	14%	3%	25%	16%	13%	2%	25%	100%	

Table 4: Articles by Level of Government and Location

Article types and research methods

Over half (55%) of the total articles published consist of empirical papers that draw on data collected from primary or secondary sources. Case studies and other qualitative methods are the most common approaches in this body of work, representing over half (53%) of the empirical papers published. Surveys and other quantitative methods are used in about one-third (36%) of the empirical research. Several articles combine methods in a mixed- or multi-method approach.

Approximately one-fifth (18%) of the articles reviewed adopt a theoretical or conceptual perspective, offering frameworks for understanding and comparing open data and related policies (Nugroho et al., 2015). Researchers provide commentary or normative policy guidance in approximately 10% of the articles reviewed and develop methodological approaches in a similar volume of published work. Methodological papers provide ‘how-to’ implementation guidance to practitioners (Lourenço, 2013) or develop assessment tools (Veljković et al., 2014) for use by researchers and other parties seeking to benchmark or otherwise evaluate OGD programs and initiatives.

.	Case study	Other Qualitative	Other Quantitative	Survey	Other/Unspecified	Mixed/Multi-method	Other	Total	Total (%)
Empirical	54	25	29	24		7	9	**148**	55%
Theoretical	3	13	1		25	6	2	**50**	18%
Commentary	3	8			18		4	**33**	12%
Literature review		5			2		4	**11**	4%
Methodological	3	3	4	1	14	3		**29**	11%
Total	**63**	**54**	**34**	**25**	**60**	**16**	**19**	**271**	100%
Total (%)	23%	20%	13%	9%	22%	6%	7%	100%	

Table 5: Articles by Type and Research Method

Eleven (11) articles were classified as literature reviews based on their primary objective. Prior reviews help to synthesize prior research and identify trends in OGD and related practice areas (Attard et al., 2015; Ruhlandt, 2018), or contribute an in-depth view of specific aspects of OGD, for example the utilization (Safarov et al. 2017) or democratic impact (Ruijer and Martinius, 2017) of OGD. A variety of literature review methods are employed, including bibliometric and topic-modelling techniques (Corrales-Garay et al. 2019; Afful-Dadzie and Afful-Dadzie 2017), to complement traditional review methods.

Research focus

The expansion of OGD into new research domains is reflected not only in the range of journals publishing OGD research, but even more notably, in the theoretical and empirical phenomena investigated therein. Table 6 shows the publication trend in terms of the seven subject areas or topics used to categorize the research reviewed. The discussion that follows considers not only the topics listed in Table 6 but also the type of inquiry, which tends to reflect the methodological approach taken (e.g., theoretical/conceptual understandings, implementation guidance, or assessment methodologies).

.	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019***	**Total**	Total (%)
Open Government/Open Data		1	2	3	22	27	15	39	19	10	**138**	51%
(Smart) Cities		1	1		3	2	6	7	4	5	**29**	11%
e-Government		1		2	3	2	7	4	2	5	**26**	10%
Data					2		4	2	4	1	**13**	5%
Public Financial Management	1	2	1	6	1	6	2	6	4	2	**31**	11%
Transparency			1	4		3	2	1	2	3	**16**	6%
Other				2	1	4	4	4	1	2	**18**	7%
Total	**1**	**5**	**5**	**17**	**32**	**44**	**40**	**63**	**36**	**28**	**271**	100%
Total (%)	0%	2%	2%	6%	12%	16%	15%	23%	13%	10%	100%	

Table 6: Articles by Focus

Research published in the early period of this review contributed to the extant literature on public financial management and transparency. The first article published in the review period (Wehner, 2010) contributes to a well-established stream of PFM research (i.e., the common pool resource problem) using data from the Open Budget Survey to study the effect of political and institutional variables on budget outcomes (i.e., the budget deficit). Most research published in the early years of the decade follows in a similar vein, extending extant streams of research on transparency and public financial management systems (i.e., public budget processes and institutions) (Carlitz 2013; Gollwitzer 2011; Blume and Voigt 2013; Alt et al. 2013; Wehner and de Renzio 2013; Ríos et al. 2013). Lourenço (2013) identifies open data as one of several information sources within an overall data disclosure strategy. Other authors question why transparency (in particular over public expenditure) is so elusive and consider the limits of transparency in democratic governance (Grimmelikhuijsen, 2012; Heald, 2012). Articles continued to be added to these streams of research each year, but the relative share of PFM and transparency topics diminished as the body of work on OGD grew. Overall, research focusing on PFM and transparency represented less than 20% of the articles published in the decade under review.

OGD began to emerge as a field of study in the early years of the decade and by 2014 mushroomed to become the focus of 70% of the total published work. Early work set out to help understand the "promising phenomenon" (Kassen, 2013) of open data by exploring the benefits, barriers, myths, and success factors associated with open government and open data (Janssen et al. 2012; Conradie and Choenni 2014; Barry and Bannister 2014; Wang et al. 2019; Kassen 2017). Prior work surveys the current landscape and traces the origins and conceptual development of open government data (Wirtz and Birkmeyer 2015; Petychakis et al. 2014; Grimmelikhuijsen and Feeney 2017) and frames open data in terms of its public value and democratic potential (Meijer et al. 2014; Ruijer and Martinius 2017), economic value (Ahmadi Zeleti et al. 2016), and its potential for innovation and collaboration (Jetzek et al. 2014; Mergel 2015; Zhang et al. 2017).

Authors have developed conceptual models and frameworks to clarify aspects of OGD (Sieber and Johnson 2015; Zuiderwijk et al. 2014; Abu-Shanab 2015; Khayyat and Bannister 2017). The determinants of open data are considered (Yang et al. 2015; Yang and Wu 2016) and often incorporated into broader conceptual models and frameworks. Prior work highlights the multiple meanings of open data according to different stakeholder groups, including a limited number of private sector or business perspectives (Gonzalez-Zapata and Heeks 2015; Sayogo et al. 2014; Ahmadi Zeleti et al. 2016). Most research considers open data in public sector contexts, with some authors highlighting the associated tensions, contradictions, and myths associated with open government and open data (Kornberger et al. 2017; Meijer et al. 2014; Hellberg and Hedström 2015; Marjanovic and Cecez-Kecmanovic 2017).

Giving attention to the relationships between different stakeholder groups, authors have considered relations between OGD advocates and policymakers as well as the involvement of external parties in co-created and citizen-generated open data (Johnson, 2017; Khayyat and Bannister, 2015; Meijer and Potjer, 2018). Within government, attention has been given to organizational culture (Ruijer and Huff, 2016) and the perceptions and resistance of public personnel as a key stakeholder group (Criado and Ruvalcaba-Gomez, 2018; Wirtz et al., 2016).

As open data was embraced in organizational practice, research was published to aid in the planning and design of OGD programs and infrastructure (Dawes et al. 2016; Zuiderwijk et al. 2014; Jetzek 2016; Zuiderwijk and Janssen 2015). Several authors give explicit attention to demand-side perspectives, including commercial value generation (Ohemeng and Ofosu-Adarkwa, 2015; Zuiderwijk et al., 2016). Some authors consider technical requirements, considering the role and types of technologies and licenses adopted (Ganapati and Reddick, 2014; Khayyat and Bannister, 2015), for instance, while others take a more procedural and sometimes normative tone, offering ‘how-to’ methodologies to support implementation efforts. This guidance sometimes makes reference to global transparency and accountability institutions, including the Open Budget Index, and disclosure strategies that can (and/or should) be adopted as part of broader transparency and accountability strategies (Renzio and Masud 2011; Seifert et al. 2013; Carlitz 2013; Lourenço 2013).

Alongside (and sometimes using) these guides and decision support models, some researchers set out to assess implementation efforts and evaluate data portals and the quality of data contained therein (Attard et al. 2015; Parycek et al. 2014; Zuiderwijk and Janssen 2014; Vetrò et al. 2016; Fan and Zhao 2017; Kubler et al. 2018; Debattista et al. 2016; Chatfield and Reddick 2017). Several authors have developed methodologies for automated assessment of online data portals (Neumaier et al. 2016; Nascimento et al. 2018; Correa et al. 2019).

Other researchers have assessed open data implementation efforts and evaluate progress toward achieving on the initial policy objectives of delivering democratic and public value, fostering innovation and collaboration, and enabling economic value creation. Indeed, open data policies make datasets available to all interested parties to use in evaluating public policy and assessing aspects of organizational performance as varied as the data itself. Several examples of research using open datasets were identified in this review, for example in the use of open spending data to predict war (Whitmore, 2014) and using TripAdvisor reviews to predict tourist preferences (Pantano et al. 2017).

Datasets released in open formats have also been used to conduct comparative assessments across jurisdictions (Nugroho et al. 2015; Thorsby et al. 2017; Styrin et al. 2017) as have composite indexes compiled by international organizations such as the Open Knowledge Foundations’ Open Data Index or the International Budget Partnership’s Open Budget Index (Harrison and Sayogo, 2014; McLoughlin et al., 2019; Menifield et al., 2017). In addition, open data benchmarks and methodologies have themselves been the subject of research that discusses their relative strengths and weaknesses and highlights their limitations (Michener, 2015; Susha, Zuiderwijk, et al., 2015).[3]

Another noteworthy stream of OGD literature looks broadly at the use and users of open data and public sector information more generally. This research looks at factors influencing the acceptance and use of OD and related technologies (Zuiderwijk et al. 2015; Saxena and Janssen 2017) and at organizational measures that can facilitate the use of open data (Susha, Grönlund et al. 2015b; Wirtz et al. 2018; Custers and Bachlechner 2017). Based on their review of the literature on OGD utilization, (Safarov et al. 2017) propose a multi-dimensional framework that considers the types, conditions, effects, and users of OGD. Research on visualizations and analytics, key outputs fueled by open data, are also considered in terms of their use in policy-making (Graves and Hendler, 2014; Hagen et al., 2019).

Researchers have looked at the use of open data both inside and outside the public sector (Lassinantti et al. 2019). In considering the use of OGD in democratic contexts, authors draw attention to citizen participation and establish the links between data, users, and relevant societal issues (Ruijer et al. 2017; Hivon and Titah 2017; Gértrudix et al. 2016; Gascó-Hernández et al. 2018). This research attributes the observed lag in data use to a lack of technical skills and user training and consider interventions that can increase engagement. Researchers have also looked at the use of OD in innovation, considering also the barriers users face in their efforts to this end (Mergel et al. 2018; McLoughlin et al. 2019; Smith and Sandberg 2018).

While the economic potential of open data is an oft-cited rationale for open initiatives, there is little evidence as yet to confirm widespread interest and uptake in the private sector (Herala et al. 2018; Susha, Grönlund et al. 2015a). To bridge this gap, research has considered open data business models (ODBMs) and collaborative approaches as potential mechanisms to leverage the potential of open data (Ahmadi Zeleti et al. 2016; Susha 2007).

[3] Michener (2015) explains the dilemma of "ontological compatibility" in which countries can rank favorably on composite indexes despite the absence of necessary policy provisions.

OG and OD have been studied in relation to other public management principles and practices. Given the historical development and current state of OGD practice, freedom of information (FOI), public sector information (PSI), and algorithmic accountability are of particular relevance (Shepherd 2015; Janssen 2011; Yoon et al. 2019; Fink 2018).

As the literature centred on open OGD grew, so too did research on related data topics (Hendler, 2014; McDonald and Léveillé, 2014) and policy/practice innovations, including e-government (Abu-Shanab et al., 2013; Kassen, 2014; Misuraca and Viscusi, 2014; Seri et al., 2014) and smart cities (Desouza and Bhagwatwar, 2012; Wachhaus, 2011). These closely related topics represent 25% of the articles reviewed and combine with OGD to account for on average 80% of total annual publications from 2014 onwards.

2.4. Discussion & conclusion

Tracing its origins to early political and democratic theory and brought to life in the freedom of information practices of the late 20th century, openness has now become a basic expectation for 21st century governance. This review has traced the growth in research on open government and open data, including works both *on the topic of* and *using* open data. In addition to highlighting trends in the extant literature, the review aims to connect accounting and open data research and identify the possibilities for future research at the intersection of the two fields of inquiry. This section concludes by answering the final research question from two complementary perspectives:

RQ3. What are the future opportunities for open government data research?

RQ3.a What can accounting research contribute to the field of open government?

RQ3.b Why should open government data be considered in accounting research?

By tracing the development of OGD research, this review confirms gaps to which to which the subsequent chapters in this dissertation aim to contribute. First, extant literature is largely normative and fails to adequately distinguish the anticipated from the actual effects of open initiatives (Attard et al., 2015; Safarov et al., 2017). Little evidence has been provided to support assumed relationships (often consistent with principle-agent models), leading some to dismiss OGD policies and their proponents as simplistic or even naïve. Second, given the normative and descriptive orientation of this body of research, little attention has been given to its theoretical underpinnings (Hossain et al., 2016) including a notable lack of critical theorizing. Third, open government and open data has been largely overlooked in the field of accounting. Despite obvious theoretical and empirical links between accounting and open data, particularly in the domain of public financial management (i.e., the production, dissemination, and use of financial information), these two bodies of research remain disconnected.

Accounting research can help fill the research gaps identified by contributing theoretically informed empirical analyses of open data initiatives, particularly in public financial management. Indeed, accounting research has a long history of exploring the calculative, narrative, and visual practices involved in the production, dissemination, and use of financial information (Davison, 2015; Hopwood, 1992). Accounting literature explains the multiple roles of accounting in organizations and society and links accounting to broader managerial and rhetorical practices (Burchell et al., 1980; Walker, 2016). Whereas instrumental views on data follow cause-and-effect relations in which numbers are accepted as neutral representations of reality, accounting researchers have argued that these numbers cannot be separated from their use (Vollmer, 2007; Graham, 2008). Such sociological framings offer a useful starting point to understand open data practices from user perspectives and in terms of the anticipatory effects such consumptive uses may have on open data providers. Future research could theorize open data as an extension of the financial communication process, one that actively engages the account holder in the interpretive act of co-producing an accounting object, not simply as a passive recipient of the interpreted representations put forth by the account provider.

This review also introduces open data as an important topic that warrants further exploration in accounting research for several reasons. First, open data practices embraced by governments worldwide in recent years have extended traditional public financial management (PFM) processes and reshaped financial communications. New presentation formats have been introduced and enable users to engage with financial and other accounting data in digitally mediated forms. Certainly, these changes have implications for the production and consumption of accounting information. However, while research on open data has proliferated in public administration and related fields over the last decade, it remains largely unaddressed in accounting research.

In sum, this review has exposed the disconnect between open data and accounting research and proposes future research directions that will (i) leverage insights from accounting research to better understand and assess the potential of open data and (ii) ensure that accounting research remains present at the in modern accounting and administrative practice, not only in areas of private sector innovation but also with respect to trends emerging in public sector organizations. The aim of this review is, thus, to encourage accounting research that both opens up to consider emerging areas of practice and reaches out to engage with broader theoretical perspectives and research communities.

Chapter 3: Theorizing Open Data – an Accountability Perspective

3.1. Introduction

Accountability and transparency are closely linked but loosely defined as necessary components of democratic governance. Indeed, account-giving relationships and associated behaviours and practices such as transparency form the foundations of democratic governance (Dubnick, 2014). This chapter is concerned with the relationship between accountability and transparency in the context of open organizational approaches, specifically open government data (OGD). The theorization aims to separate the two terms – transparency and accountability – to understand their meanings in relation to one another within 'open' organizations.

To better understand accountability and transparency individually and in relation to one another, this chapter begins by reviewing the two literatures, revealing common characteristics and parallel perspectives in both streams of research. It then deconstructs the notion of accountability into its multiple dimensions and proposes a framework suitable for use in accountability studies (i.e., the empirical study presented in Chapters 4 and 5). Finally, it concludes by theorizing open data within the accountability framework presented.

3.2. Theoretical perspectives on accountability and transparency

The ever-expanding bodies of literature on accountability and transparency have investigated the two terms in similar ways: as inherent virtues and instrumental mechanisms of democratic administration. Prior research has also looked at the limitations and 'dark sides of transparency and accountability, leading to a rich analysis of both (Etzioni, 2014; Roberts, 1991, 2009). However, less is known about the relationship between the two (Fox, 2015). Hood (2010) identifies three frames for understanding transparency and accountability in relation to one another. As *Siamese twins* transparency and accountability are indistinguishable from one another, both inherent virtues falling under the umbrella of 'good governance'. As *matching parts*, one contributes to the other to produce good governance. But as *awkward couple*, transparency and accountability may be at odds with one another, involving elements that create friction and tension. Each of these relationships are considered in the following sections, with reference to the three main perspectives taken in the literature.

Siamese Twins: virtues-based views of accountability and transparency

A first body of work adopts the perspective of transparency and/or accountability as an ideal or virtue. In this view, transparency and accountability are goods that have inherent value in a democratic society (Dubnick 2007, Bovens 2010). This perspective focuses on the characteristics and behaviours of the actors (individuals, organizations) involved. An actor is considered transparent when open about behavior, intentions and considerations, for example. Similarly, an actor is accountable when they show a willingness to act in a fair, equitable, responsive and responsible way. Transparent and accountable are thus *ways of being* and desirable qualities of officials and the organizations they make up. Viewed in this way, transparency and accountability become normative concepts, establishing a set of standards that define expected behaviour for individuals and provide a basis for evaluating their actions. These virtues provide legitimacy to public officials and organizations and contribute to trust and confidence in government.

This view aligns with democratic philosophies on openness (Popper, 1962) and underlies rights-based approaches to transparency research and practice, specifically the freedom of information (FOI) movement in which access to information is treated as a human right (Birkinshaw, 2006). Accountability studies that adopt this 'soft' view of accountability are ultimately studies about good governance. The virtues perspective corresponds most closely to Hood's *Siamese twins* relationship in that both are seen as inherent virtues that become synonymous with one and other and with other notions of good governance (e.g., justice, equity, democracy). The distinction between the two constructs becomes blurred to the extent that they are grouped together under overarching notions of 'good governance' and 'democracy.'

Matching parts: instrumental views of accountability and transparency

Unsatisfied with the claim that accountability and transparency are, in themselves, inherently good, a second perspective asks what, exactly, are they good for? And how, exactly, do they deliver on these desirable ends? From this perspective, transparency and accountability hold instrumental value as mechanisms that deliver on the various ends of democratic governance. In this view, accountability is defined as "a relationship between an actor and a forum, in which the actor has an obligation to explain and to justify his or her conduct, the forum can pose questions and pass judgement, and the actor may face consequences" (Bovens, 2010, p.

450) and transparency is defined as “the availability of information about an actor allowing other actors to monitor the workings or performance of this actor” (Meijer, 2014, p. 511). As a form of information exchange, transparency provides visibility on the actor’s behaviour (processes) and performance (outcomes), thereby allowing both to be monitored. Thus, transparency ensures the availability of information about an actor that allows the forum to monitor performance (Meijer, 2014) and provides accountable actors (e.g., elected and administrative officials) with a vehicle to account to (and be held accountable by) accountability forums (e.g., citizens) for their stewardship (Heald, 2012).

Together, accountability and transparency provide a series of interrelated institutional arrangements that mediate relations between parties (actor and forum) to deliver intended results. The instrumental view of accountability and transparency as mechanisms or institutional relations (Bovens, 2010) corresponds with Hood’s (2010) *matching parts* relationship. The two are closely related in that one (transparency) contributes to the other (accountability). But they are not the same thing as suggested in the *Siamese twins* relation. Instead, transparency is positioned as a pre-requisite for accountability. There is a causal relationship between accountability and transparency such that transparency enables accountability; both are necessary instruments of and contributors to good governance. The instrumental view is reflected in Bovens’ (2007) process model of accountability, according to which disclosure (i.e., transparency) is a starting point for the subsequent stages – debate and judgment by the forum, and potential consequences for the accountable actor – to be realized and the accountability process to be fulfilled.

This perspective is useful for studying the specific organizational contexts and institutional arrangements through which an actor is rendered transparent to and held accountable by relevant forums. This approach is used to explore specific mechanisms such as contractual, legal, or other institutional arrangements that constitute the accountability regime. This view may equally be applied at the level of an entire system, which comprises multiple sets of relations. In either case, the analysis focuses on the rules and procedures that guide the behavior of actors within the system that ensure that public officials and organizations remain on the virtuous path and maintain a functioning system of democratic governance.

Awkward couple: contra-views of accountability and transparency

Accountability and transparency are also contested concepts, involving elements that "by no means always combine to produce good governance, and indeed can be in tension at least sometimes" (Hood, 2010, p. 990). A third stream of research presents more critical views that explore the limitations, tensions, and contradictions evident in the accountability and transparency discourse. These views are explored from both pragmatic and philosophical orientations. From a pragmatic perspective, researchers have pointed to the practical and cognitive limits of transparency. Practically speaking, the potential of accountability and transparency is often oversold due to the public's lack of time and/or interest and the fact that most people do not have the necessary training to evaluate the data presented to them (Etzioni, 2014; Heald, 2012). Some point to technology as a savior, able to process vast amounts of data. But technology introduces other limitations as a result of its own opaqueness (O'Neil, 2016). The problems of too little accountability and accountability deficits arise in situations where institutional arrangements for accountability are absent, whereas accountability overloads, multiple accountabilities, and the problem of too many eyes are all seen as consequences of too much (Mulgan, 2014; Schillemans and Bovens, 2005). In situations involving the latter, agents are often held accountable for adherence to multiple and sometimes contradictory standards (Steets, 2010). In these situations, accountability demands can have a paralyzing effect on organizations and produce 'multiple accountabilities disorder' (Koppell, 2005).

More complex and nuanced interrelations involved in account giving are explored from a philosophical perspective in the 'problematics of accountability' literature (Joannides, 2012; Roberts, 1991; Shearer, 2002; Sinclair, 1995). In this stream of literature, researchers question the limits of (transparency as) accountability, given the ethical burden that demands for accountability place an on those (individuals and/or organizations) called on to provide an account. Drawing on moral philosophy (e.g., Levinasian perspectives), this body of research highlights potential conflicts between the 'who' and 'to whom' dimensions of accountability, including the ethical violence (Butler 2005) that occurs in situations where the accountable actor (i.e., the accountable self) is called on to account for something which is very difficult, if not impossible, to justify (Messner, 2009; Roberts, 2009).

3.3. Theoretical framework for understanding accountability

Given the many types of and perspectives on transparency and accountability, as well as the varied relationships between the two, a wide theoretical lens is needed to identify and understand the organizational practices that aim to deliver on these democratic ideals. To develop this theoretical orientation, I turn to Bovens and colleagues' (Aleksovska and Schillemans, 2022; Bovens, 2005; Bovens et al., 2008; Schillemans and Bovens, 2005) work on public accountability, starting with the definition of accountability as:

> *"a relationship between an actor and a forum, in which the actor has an obligation to explain and to justify his or her conduct, the forum can pose questions and pass judgement, and the actor may face consequences"* (Bovens, 2007, p.450).

This definition allows the multi-dimensional construct to be broken into its component parts and analyzed using a series of interrelated questions: who is accountable to whom? For what? By which means? To what ends? These questions have been used in prior literature (Joannides, 2012; Sinclair, 1995; Romzek and Dubnick, 1987) to develop typologies of accountability and provide a useful guide to identify and interrogate the various elements of accountability as shown in Figure 2.

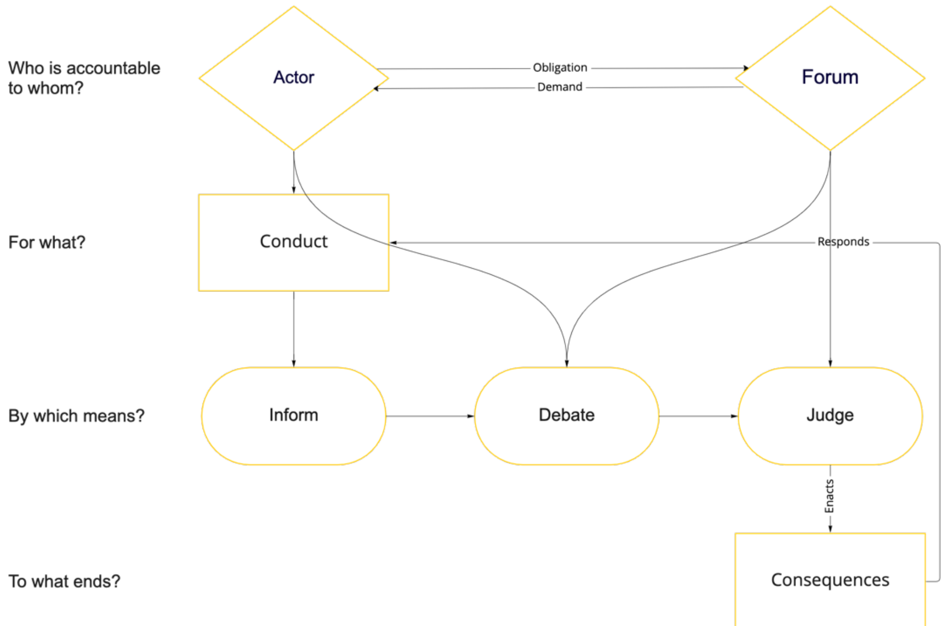

Figure 2: Public Accountability Framework (adapted from Bovens, 2007)

Rather than narrowing in on a single relationship or organizational practice, this framework sensitizes us to the wider set of institutional arrangements, both formal and informal, that make up the public accountability regime. It provides a framework for positioning individual elements within the broader set of arrangements and considering them in relation to other aspects of the accountability regime.

Who is accountable to whom?

Systems of accountability involve a complex set of reciprocal rights and obligations (Roberts and Scapens, 1985). Thus, the relational community in which practices and procedures followed in the process of account giving (and taking) cannot be ignored. The question *who is accountable to whom?* considers the parties linked in an accountability relationship – the actor (provider of account) and forum (demander of account) – and the obligations between them. The forum places a demand on the actor who recognizes an obligation toward the forum to provide an account for their conduct. In Bovens' (2007) taxonomy, classifications based on the actor-forum relationship reflect the nature of the actor (corporate, hierarchal, collective, individual), the nature of the forum (political, administrative, legal, administrative, professional, social), or the nature of the obligation between them (vertical, diagonal, horizontal). Each accountability relation can be classified separately based on these dimensions and assigned an individual label (type), but the close connections between them result in common groupings of related or co-occurring types. Formal accountability structures in most public organizations, for example, tend to follow hierarchical chains of command based on delegation from principals to agents and, thus, reflect vertical lines of accountability according to which agents are formally obliged to account to their principals. This is the case for most forms of political accountability (i.e., representative democracy), as reflected in traditional forms and theories of bureaucratic administration (i.e., Weberian bureaucracy). At the opposite end of the spectrum, where formal structures and hierarchical relations are lacking, an actor may undertake to provide an account for their conduct to a broader set of stakeholders, often the public. Also referred to as mutual accountability, these horizontal relationships tend to be based on the actor's sense of moral obligation toward a broader social group or to society as a whole.

For what?

In an accountability relationship, the accountable party is obliged to explain and provide justification for their conduct. The *for what?* question considers the aspect of the actor's conduct to which the forum's accountability demand relates. Given that there are many aspects to this conduct, it is possible to distinguish accountability with reference to the aspect that is most dominant (Bovens, 2007, p.459). *Process accountability* traces its origins to the practice of accounting, placing an emphasis on procedural compliance. This narrow view of accountability is concerned with adherence to prescribed rules and/or established practices. *Performance accountability,* on the other hand, takes a broader view of public accountability and is concerned with the outcomes achieved as a result of the actor's conduct. Most accountability systems are a form of process-outcome hybrid (Patil et al., 2014).

Traditional bureaucratic administration adheres to the tenets of process accountability, placing its focus on compliance with rules and regulations. However, as governments adopted more managerial approaches inspired by private sector practices, the focus shifted toward performance (Bovens, 2005). This is in line with the new public management (NPM) doctrine, where more freedom is granted to officials to determine the most effective process through which to deliver results – and managers are held accountable for these results (Hood, 1995).

By which means?

Having established the accountability relationship(s) formed between parties and the relevant aspect(s) of conduct at the center of the accountability demand, the next question – *by which means?* – turns to the more procedural elements of accountability. Combined, the elements positioned in the third row of Figure 2 indicate a 4-step accountability process.

First, *informing* practices lead to information disclosures that provide visibility over the actor's conduct. This process of informing occurs through various forms of disclosure, including oral accounts but more often taking the form of written accounts, which include some combination of narrative, calculative, and visual elements. Transparency practices such as routine disclosure, freedom of information, and open data portals are all types of informing practices.

However, transparency as an informing practice is not enough to constitute accountability on its own. Theorizations that stop at this step remain incomplete and result in 'transparency as accountability' (Roberts, 2009). Here, the mechanisms through which transparency contributes to accountability are not considered, relying on implicit relationships and assumptions to link transparency practices to accountability outcomes. Disclosures must be mobilized as part of a broader set of institutional arrangements to achieve intended results such as learning, control and innovation. Indeed, open government and freedom of information are important prerequisites for accountability because they may provide accountability forums with the necessary information. However, this transparency is not enough to qualify as a genuine form of accountability because it does not necessarily involve scrutiny by a specific forum (Bovens 2007, p. 453). Thus, we move on to consider the second stage of the accountability process, *debate*. Here, the forum draws on available information to evaluate the actor and form judgments about their conduct. The visibility provided through informing processes (including open data) fuels debate and provides a basis on which the forum's *judgment* are formed.

To what ends?

In the final stage of the accountability process, the forum has the possibility to impose *consequences* on the accountable actor in line with the judgments formed. While consequences can be extended in the positive form of praise, they more often take the negative form of sanctions, imposed where conduct (expressed in terms of either procedural compliance or performance outcomes) falls short of the forum's expectations.

3.4. Discussion & conclusions

The research reviewed in this chapter reveals the multiple dimensions of and orientations toward accountability and transparency in organizational practice and suggests various relationships between the two. Recognizing this breadth and the need to go beyond rhetorical and philosophical discussions of transparency and accountability as synonymous democratic ideals or 'Siamese twins' of administrative practice, this chapter presents a framework for understanding accountability based on Bovens' (2007) definition of accountability as an institutional relation. That is, a set of institutional arrangements that mediate the relationship between actor and forum joined together in a given accountability relationship. This framework provides the basis for theorizing and analyzing open data from an accountability perspective. Specifically, it leads to three possible theorizations: OD as *conduct;* OD as *informing* practice; and OD as *debating* process. Each is discussed in turn.

Openness as conduct

Once introduced into the accountability regime, openness creates a set of organizational principles and practices which create general expectations and specific obligations that organizational actors are expected to adhere to. This includes policies and processes leading to the release of data in open formats. Transparency thus becomes an object of accountability as actors become accountable for implementing OD principles, policies, and practices. To the extent that members of the accountability forum (i.e., the public) are concerned with open principles, policies, and practices, 'openness' becomes an aspect of conduct for which actors will be held to account. Thus, as openness gains acceptance as an inherent value of democratic governance and a necessary instrument of public administration. OD thus becomes an object of accountability; organizational actors become 'accountable for' transparency, with expectations that they comply with and contribute to organizational processes leading to the release of open data.

Open data as informing practice

Interpreted most narrowly within the instrumental or process-view of accountability, transparency offers a response to the 'by which means' question offering a suite of tools that provide visibility over aspects of conduct across organizational domains or functional units. As the first stage in the accountability process, transparency is an instrument of or pre-requisite for accountability. Open data is thus an *informing* practice that results in the release of information in open formats. It adds to the suite of organizational practices (e.g., routine disclosure, freedom of information, etc.) that provide visibility over conduct. As an *informing* practice, open data translates open principles into organizational practices that provide for the release of information in open formats (i.e., with the requisite technical and legal formats to enable use).

Open data as debating process

The information made available through the informing practice of open data also opens the possibility for open data to be engaged in the second stage of the accountability as part of *debating* processes. Once Open datasets provide an informational basis on which the accountability forum can assess, debate and judge the conduct of the accountable actor. Indeed, the potential for data to be "freely used, re-used and redistributed by anyone" (Open Knowledge foundation, n.d.) is a defining characteristic of open data. Open data is most commonly associated with use by technologists that leverage public data to create innovative new tools and applications (i.e., OD for innovation). But from an accountability perspective, open data provides a rich source of information that can be used on its own or in combination with other information sources (i.e., through mashups) to fuel public debate.

Account-giving relationships and associated behaviours and practices such as transparency form the foundations of democratic governance (Dubnick, 2014). But vague and rhetorical use of the terms 'accountability' and 'transparency' blurs the distinctions and relationships between the two constructs and limits our ability to understand the organizational practices taken up in their name (such as open data). Drawing from the literatures on transparency and accountability, in particular Bovens' (2007) definition of public accountability, this chapter has developed a framework for understanding open data from an accountability perspective. Starting with the definition of accountability as an institutional relation, it separately identifies and discusses its component parts and positions them in relation to one another (see

Figure 2). This framework provides a conceptual guide for considering organizational practices, such as open data, from an accountability perspective. It identifies the possible ways in which open data becomes part of the public accountability regime. The chapter makes two primary contributions. First, it presents a framework that can be used to theorize organizational practices in relation to accountability and guide empirical analyses of accountability in organizational settings. Second, it suggests three openings through which OD can be theorized as part of public accountability systems. The analytical and theoretical insights developed in this chapter are used to guide the empirical study of open data in local government to which this dissertation now turns.

Chapter 4: Open Data as an Instrument of Accountability – Examining Open Data as Informing Practice in a Local Government

4.1. Introduction

This chapter seeks to disentangle idealized notions of accountability and transparency through critical examination of open data practices in a local 'open' government. It looks at the accountability implications of open data policies and practices, particularly in relation to public financial management (PFM) systems. Both procedural and relational aspects of account-giving in the public sector are considered, as are the objects of account-giving through which these accounts are materialized.

Like transparency and accountability, 'openness' has become a governance catch word and "master category" (Tkacz, 2015, p. 14) of political thought. As an umbrella concept, it has come to encompass, and in some ways become synonymous with, various aspects of 'good governance' including inter alia transparency, accountability, collaboration, and innovation. But public accountability and transparency "must be understood in context as part of the formal and informal structures shaping the behaviour of particular organizations and individuals" (Mulgan, 2014, p. 18). Thus, empirical study is necessary. This chapter presents the results of an empirical case study of open data in a local government.

The local (i.e., municipal) level of government offers a rich field for studying open data in the public sector because of the close interaction between citizens and the administration (Kornberger et al, 2017). In contrast to more distant levels of government (i.e., state/provincial, central/federal), cities permit close observation of the interactions between and among municipal decision-makers (political and administrative officials) and members of the public to whom they are accountable. With municipal government having the most direct impact on the lives of residents, open data has the greatest potential to reshape the relationship between citizens and government at this level (Goldstein and Dyson, 2013). Further, the local level of government permits observing accountability relations "on the ground, in practice, in relation to mundane objects and technologies" (Woolgar and Neyland 2013, p. 14) to explore the primary research question: "what is the relationship between accountability and transparency in the context of open government data?" Specifically, in this chapter, I consider the producer perspective, looking at two related sets of organizational practices (information management and financial management) to examine how open data is mobilized as an instrument of accountability as part of the local government's suite of informing practices.

4.2. Literature and theoretical development

Applying the theoretical orientation developed in Chapter 3 to the empirical analysis of open data in the City of Toronto, I identify a range of co-existing transparency practices and accountability pathways and conclude on the impact of open organizational policies on the same. The accountability framework derived from Bovens (2007) provides a starting point to identify the elements of accountability evident in the municipal government setting under review, with a focus on open data as an *informing* practice. This framework, represented in Figure 3.

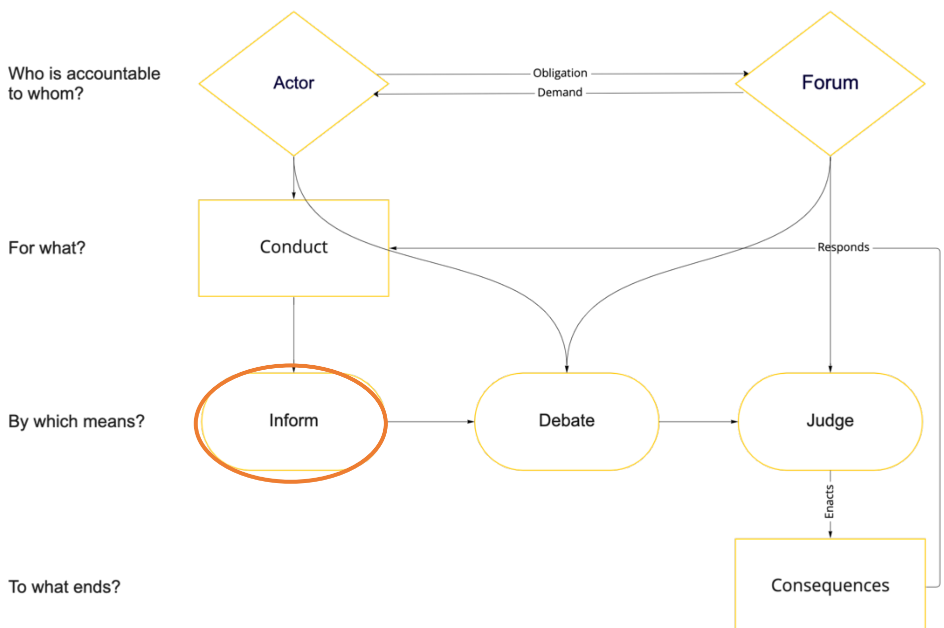

Figure 3: Theorizing Accountability: Open Data as Informing Practice

The various dimensions reflected in Figure 3 public accountability framework are elaborated on in Chapter 3 and thus omitted from further discussion here.

4.3. Empirical setting and methods

Empirical setting

The empirical setting is a case study of open data in the City of Toronto, Ontario, Canada, (hereinafter, the "City"). The investigation was based on an in-depth case study methodology (Yin, 2009, 2018) deemed appropriate for investigating a contemporary event – the introduction of open data in in public sector management and administrative practice. Whereas open data is a dynamic and evolving practice, the case study method allows for a critical examination of continuing developments in this space.

With a population of a population of almost three million inhabitants and an annual operating budget of approximately $13 billion, Toronto is the fourth largest municipality in North America. The present-day City was formed in 1998 through the amalgamation of seven former municipalities, a legacy reflected in the City's motto, "diversity is our strength." The City was one of the first in the country to adopt an open data policy and makes datasets available through its open data portal. The City was chosen as a "common case" (Yin, 2009, p. 50), given its experience as an early adopter of open data as a socio-technical process that promotes accountability and transparency in public administration. The local government, which engages a wide range of stakeholders including residents, provides an ideal setting for studying public accountability.

Empirical material

The case study incorporated three primary methods of data collection: document analysis, participant observation, and semi-structured interviews (see additional details provided in Appendices C and D). First, key documents were collected to identify the formal accountability arrangements that constitute the City's accountability regime and focused on official documentation, including legislation governing the City's administration and relevant municipal policies/procedures. Second, 20 semi-structured interviews were conducted with individuals both within and external to the City administration. Three key groups were targeted: officials employed as members of the public service (i.e., civil servants) including members of the City's open data team (ODT) and officials responsible for matters of financial administration in the Office of the Chief Financial Officer and Treasurer (FIN); elected officials serving as members of the Toronto City Council; and members of the general public who expressed interest or demonstrated active involvement in municipal financial matters including open data. All interviews were recorded and transcribed, providing approximately 300 pages of data. Finally, participant observation took place at both City events (e.g., Council meetings, budget consultations) and events hosted by external parties (e.g., Civic Tech meetups, public events, etc.). This permitted direct observation of the interactions within and between groups engaged on matters related to open data and City finances.

Method of analysis

Consistent with prior research (Bovens 2007, 2010; Meijer, 2014; Dubnick, 2014), this study adopts a relational view of accountability that views accountability as a series of institutional arrangements necessary for democratic governance. The analytical framework emerges from the theoretical framing of accountability summarized in Figure 3 (discussed in Chapter 3). The framework asks a series of interrelated analytical questions: (1) who is accountable to whom?; (2) for what?; (3) by which means?; and 'to what ends? The theoretical orientation that guides this analysis draws attention to the multiplicity of voices – even among those situated within the City administration (i.e., civil servants) – enrolled in the City's open data practice.

Data analysis was conducted in two stages to examine the introduction of open data policies and practices by asking the following questions:

1. *What are the key structures of municipal governance structures and how was OD added to the municipal accountability regime?*
2. *How were OD practices implemented in the organization and by whom?*

An initial set of codes was used to identify the accountability arrangements using the seven elements shown in Figure 3: (1) actor, (2) forum, (3) conduct, (4) informing (i.e., disclosures); (5) debating; (6) judgment; and (7) consequences that characterize the accountability regime. Since accountability operates through procedures in which actors are to explain and justify their conduct to forums (Bovens 2007), the first stage of the analysis set out to identify how open data was integrated into the City's accountability regime. The second stage of analysis sought to identify divergent views toward accountability and transparency among and between municipal actors. Overall, the analysis sought to maintain analytic skepticism as to the claims and uses of financial information in the City, looking closely at the details of interaction to reveal critical resources and strategies used by participants in the production and dissemination of municipal financial information. The analysis aimed to identify patterns of interactions between and among actors, primarily those operating at the administrative level (i.e., civil servants), involved in open data, specifically in relation to the City's financial information management practices.

4.4. Empirical analysis & findings

Institutional arrangements: the municipal accountability regime

Key features of the City's accountability regime are set out in the *City of Toronto Act* (the "Act") and other applicable legislation. The Act sets out the areas falling under municipal jurisdiction and defines the overall governance structures (e.g., key roles and responsibilities, reporting requirements, etc.), providing a framework that enables the City to provide "good government" within its areas of jurisdiction. According to the Act, the City exists "for the purpose of providing good government with respect to matters within its jurisdiction, and the City council is a democratically elected government which is responsible and accountable" (City of Toronto Act 2006). At the highest level, this provides the answer to the 'for what' accountability question, establishing the City's two overarching purposes: first, to (i) deliver municipal public services within (ii) a system of democratic governance.

The City's governance model relies on a balance between three key groups: the public, which encompasses its 3 million inhabitants; the political level, comprising twenty-five democratically elected City Councillors; and the administrative level, consisting of nearly 40,000 officers and employees who implement council decisions and administer City programs/services. Accountability relationships within and between these groups are embedded within the City's governance structure, connecting the political (mayor and council) and administrative (officers and employees) levels to members of the public and to one another. The City's political and administrative representatives are charged with conducting activities that "foster the economic, social, and environmental well-being of the City and its residents" (City of Toronto Act, 2006).

In addition to the provisions set out in the Act, the City has the authority to govern its affairs through municipal by-laws. This empowers the City to determine its mechanisms for governing and delivering municipal services, including the decision-making processes and organization structures which it administers its its activities. The City's governance structures include institutional arrangements to deliver accountability to the public and provide transparency over the decision-making process. City Council is empowered to determine the ways the City will try to ensure that it is accountable and transparent to the public for its actions, using the Municipal code and corporate policies to formalize these arrangements. To this end, the City's affairs are organized as depicted in the organizational chart presented in Figure 4, which shows the structure through which municipal services are delivered and democratic governance administered.

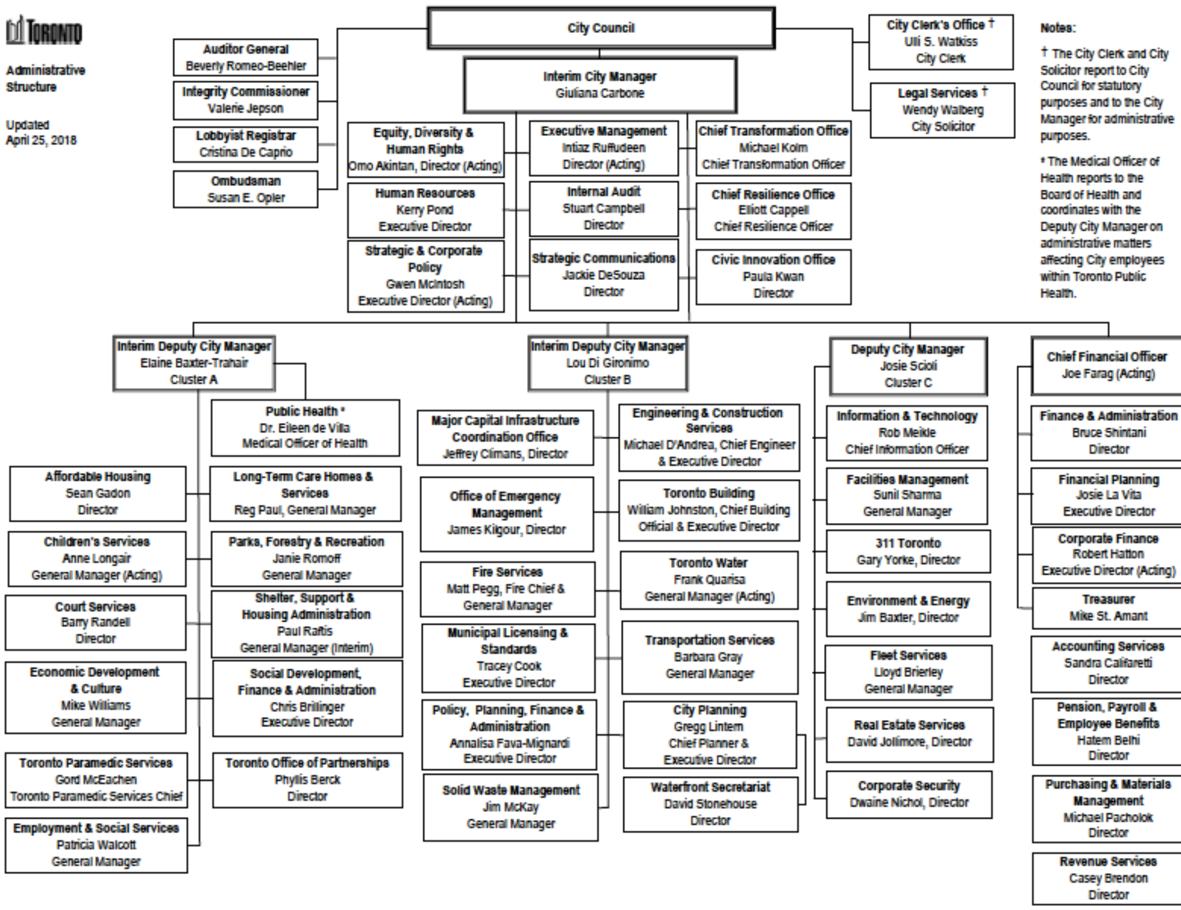

Figure 4: City of Toronto Organizational Chart

The organizational chart shows the City governance as divided into key service domains and administrative functions. Each municipal service unit and consolidated entity can be positioned within the organizational chart based on their primary service area or administrative function. Key offices (and officers) are listed in the top half of Figure 4, including City Council, Offices of the Mayor, City Manager, and Clerk, as well as the City's four accountability officers.

Related areas of municipal activity are grouped in the four branches shown in the bottom half of Figure 4. Community and Social Services include the external or public-facing services that make up the City's social safety net (e.g., affordable housing, fire and paramedic services). Internal services support City programs as part of the Corporate and Financial Services branches.[4] Individual actors (organizational units and individual officers/employees) assume responsibilities beyond their primary domain of service/administration by collaborating with other actors in the delivery of municipal services. They perform necessary roles in cross-cutting administrative functions including information management and financial management. This creates secondary responsibilities or accountability obligations that fall outside actors' core service domains or administrative functions, but which are necessary for the functioning of the democratic administration overall.

Institutional arrangements for financial information management

As outlined in the preceding section, the City's governance model provides a framework for municipal administration and delivery of municipal services through a series of delegated and shared responsibilities. Key administrative functions of interest in this study include information management (including open data) and financial management (including accounting and budgeting). The introduction of open data as a new component of financial information management in the City requires the participation of both actor groups. The City's open data policy, developed centrally within the Information Management division, applies across all divisions, including Finance. To support OD implementation, the City's Information Technology division provides the enabling Technologies to be used across all administrative units. The overlap between key administrative functions is illustrated in Figure 5. Key roles and responsibilities (i.e., primary and secondary accountabilities) assigned to each, as they relate to financial information management, are outlined thereafter.

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[4] Infrastructure and Development Services is charged with delivering the physical infrastructure necessary to perform daily operations and to support the City's future growth.

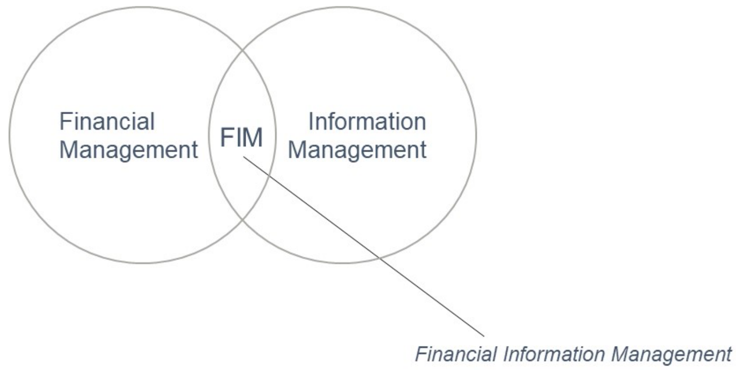

Figure 5: Administrative Functions in Financial Information Management

Financial management

Parameters for the City's financial administration are set out in Part VII (s. 227-244) of the City of Toronto Act and further defined in Chapter 71 of the Municipal Code. Primary responsibilities for maintaining accurate records and accounts and ensuring compliance with the regulations made under Part VIII of the Act (Finances) fall to the Office of the Chief Financial Officer and Treasurer (FIN). The financial management process covers the stages of the annual budget cycle summarized in Figure 6 (proposal, approval, execution, reporting & oversight) as well as long-term financial planning in accordance with the City's Integrated Performance and Planning Framework (IPPF). Finance staff coordinate these financial management functions, putting in place processes that comply with requirements set out in the relevant authoritative instruments and based on financial management principles.

In terms of outcomes, Finance staff must respect the balanced budget requirement set out in the Act (i.e., maintain a balanced budget) and the revenue constraint set by Council (which typically limits property tax increases to inflation) while responding to Council priorities in allocating funds across organizational units for the delivery of City programs and services. Finance staff set budgetary practices in accordance with requirements prescribed in legislation (i.e., the Act and the Municipal Code) and internally developed policies and processes that cover each stage of the budget cycle. The financial processes established centrally in the Finance division extend across the organization and enroll actors at all divisions as participants over the stages of the public budget cycle.

1. *Proposal:* staff in the CFOT prepare the recommended budget and submit to committees (budget, executive) and then council for approval. Budget preparation is led by the CFOT (Financial Planning) with input from all divisions.
2. *Approval:* proposed budget is debated in committee and at council. There are public consultations for public debate.
3. *Execution:* quarterly and year-end operating and capital variance reports are submitted to Committee and Council to provide information on how approved operating and capital funds are spent, and on an exception basis, identify issues that require direction and/or decisions of City Council.
4. *Reporting & oversight:* audited financial statements are published annually and the City's annual Financial Information Return (FIR) is submitted to the provincial Minister.

Figure 6: City of Toronto Public Budget Cycle

Information management

The City's Information Management Framework (IMF) sets out a standards-based approach to managing the City's information. The City's overall approach to information sharing, as defined in the IMF, is guided by the principles of transparency, accountability, and public participation. The City Clerk sets standards and policies for information and records management and manages City information through its lifecycle. It provides privacy advice and access to information and supports the City's digitization efforts. Broadly, the City's disclosure practices provide access to City information (also called "records") through one of two routes: routine disclosures (passive transparency) and freedom of information requests (active transparency).[5] The FOI process represents an active form of transparency through which a member of the public submits an FOI information request to the City Clerk's Office (i.e., the Corporate Information Services division) to obtain information that is not otherwise available. Routine disclosures, on the other hand, encompass records made available by the City's organizational units (i.e., City divisions and agencies) in the regular course of business. These

[5] A third potential route is through whistleblowers or 'forced' transparency. This route is not considered in the current study.

proactive disclosures are a passive form of transparency and include information made available electronically, for example by publishing it on the City's website(s), or in hard copy formats such as maps, brochures and reports.

As an enterprise information management initiative, the open data policy establishes a general expectation for all employees to uphold open principles, which are aligned with the City's IMF. Issued by the City Clerk's Office (Corporate Information Services Division), the OD policy aims to remove barriers and sets the rules by which City of Toronto data is made available to the public. It requires that data be made "routinely available in machine readable format for any public use" CMS 002, 2011, p. 1). Open data is thus a form of routine disclosure, or passive transparency, through which data is made routinely available in electronic (i.e., machine-readable) formats. As one of four information management principles included in the OD policy, "accountability" implies that all employees are responsible for the proper management of information. Initially falling to the City's general purpose 'web team' as an "off the side of the desk" [M1] initiative, roles and responsibilities were later formalized in the City's OD policy, which, named "staff from the City Clerk's Office and Information & Technology Division" as the City's Open Data Team (ODT).

The ODT was assigned the lead role for the OD mandate to "assess prioritize, release and monitor datasets" in accordance with the City's open data policy (CMS 002, 2011, p. 7) and thus charged with putting in place the processes and technologies required for open data in the City. The stated purpose of the open data policy is "to remove barriers and set the rules by which City of Toronto data is made available to the public as valuable, machine-readable datasets" (CMS 002, 2011, p. 3). As a new policy initiative, however, there was no prescribed process to comply with. New processes for information sharing in accordance with open principles had to be developed while at the same time respecting the existing organizational policies and values that underlie the City's broader system of democratic governance.

A necessary starting point for was to establish the technical and legal foundations for the OD program. Key outcomes were to build an OD portal as part of the City's website and to adopt a data-sharing license. With these foundations in place, the City could then publish datasets on the portal. According to the City's information management policies, division heads are required to make records easily accessible to members of the public and maintain the records in accordance with established policies. As a new information policy, OD created new roles and responsibilities for actors across the civil service. Specifically, it requires that executives "work with the Open Data Team" (CMS 002, 2011, p.3) in their efforts to make existing and new datasets available as OD. Actors across the organization are thus enrolled as participants in the open data process, with an expectation that they, as data owners, supply datasets to post on the portal.

Datasets posted to open.toronto.ca, the City's OD catalogue, are indexed by topic, civic issue, publisher, refresh rate, type, and format. A total of 433 datasets are posted, many of which include multi-year data series, from forty-one publishers (i.e., City divisions and agencies). Transportation Services is the largest publisher by number of datasets, followed by Social Development Finance & Administration (SDF&A), and the City Clerk's Office. But of the forty-eight datasets published by SDF&A, only four are tagged with the financial topic of 'fiscal responsibility', compared to thirty related to 'poverty reduction' and thirteen on 'affordable housing'.

Financial statements are explicitly included in the definition of "records" set out in Chapter 217 the City or Toronto Municipal Code as "information, however recorded or stored, whether in printed form, on film, by electronic means or otherwise, and includes documents, financial statements, minutes, accounts, correspondence, memoranda, plans, maps, drawings, photographs and films" (p. 217-2) and thus subject to information and records management policies, including open data. Interestingly, however, while the annual and multi-year budget data are provided by the Financial Planning division for publication in the open data catalogue as an open dataset, the annual Audited Financial Statements produced by the Accounting Services division are not. Instead, Accounting Services provides a limited number of more targeted datasets, for example on specific revenue sources or expense types. This suggests different approaches to information sharing are taken by organizational actors, indicating their varied use of open data as means of disseminating financial information. The next section discusses key differences identified in the case study data.

Informing practices in municipal financial management

Financial information management (FIM) is a central element and shared responsibility in any democratic administration. A wide range of actors are enrolled as participants in these processes and in the decision-making that leads to the creation and implementation of practices and processes falling under the umbrella of FIM. Each actor group has distinct preferences and priorities for their shared accountabilities, leading them to adopt different organizational practices. Analyzing these differences in the case study data helps to understand the City's implementation of open data as an instrument of accountability (i.e., *informing* practice). Three key differences are discussed next as potential reasons for the tensions observed in opening organizational practice through open data.

Difference #1 – financial information disclosure formats

As the above analysis of administrative practices shows, FIM involves a series of disclosure types and practices, including routine disclosure of City information on municipal websites, freedom of information releases, submissions made as part of the legislative process (i.e., to Council and committees) and posted to the Toronto Meeting Management Information System (TMMIS) portal, as well as open datasets released through the City's open data portal. The specific features, content, and format of each reflects its point of origin (i.e., data producer/owner), the standards according to which it is prepared, and the anticipated use. These differences are grouped here as 'disclosure formats.'

Financial information is produced following a highly prescribed set of accounting and budgeting practices, which are based on professional norms and standards that have a long and embedded history as part of democratic administration (and as core elements of democratic accountability). These practices allow for aggregation and categorization of vast amounts of data, pertaining to myriad transactions and events, in summary formats. Generally Accepted Accounting Principles (GAAP), including the public sector accounting (PSA) standards – set by the Canadian Public Sector Accounting Standards Board (PSAB) standards and applicable in the City of Toronto – for example, set out the definitions, recognition criteria, and measurement conventions that establish a common language for government financial communication. In addition to these content-related standards, GAPP also includes presentation standards that deal with the classification and aggregation of individual transactions and events into summary or aggregate views. The result is a series of highly structured financial disclosures that are presented at periodic intervals showing varying levels of detail.

Key information disclosures, from a financial accountability perspective, include, for example the City's Budget Book, its Annual Financial Report (which includes the Audited Financial Statements), and variance reports reconciling differences between budgeted and actual amounts. Lengthy annual releases, made available as PDF documents, contain numerical, narrative, and visual elements. In these, aggregate financial views are produced following the established practice of "rolling things up." Additional detail is provided in supporting documentation including the divisional Budget Notes and the Notes to the Consolidated Financial Statements. But these, too, represent aggregations, whether prepared at the divisional level or for a given component of the City's overall financial picture.

Open data represents a fundamentally different approach to information disclosure. In line with open principles and standards for information sharing, OD proponents push for the release of "non-aggregated data" in its "rawest form." As described by a member of the City's open data team: "our goal is to release the non-aggregated, primary source [data]," even aspiring to eventually be able to release data in real-time "as it's being collected" [M3]. This notion of 'raw' data is problematic from a financial information perspective. Rather than being simply 'raw' or 'collected' data, financial information is actively produced through social and political processes and with application of professional norms and standards. Transaction-level data is captured in the accounting system and goes through a series of manipulations and reviews before being compiled and released. Preparation of accounting information in accordance with PSA standards, for example, requires a series of period-end adjustments to conform to the accrual basis of accounting. The real-time release of transaction-level detail, thus, would not conform to applicable accounting standards or reconcile to the periodic financial information releases that are central to the City's accountability processes. A further concern, from the Finance perspective relates to information quality: "we cannot put dirty data up there. We have to make sure that it's clean and the adjustments are made" [M4].

There is thus a mismatch between the desired open data disclosure format – raw data provided in real-time at its most granular level – and the nature of traditional financial (i.e., accounting and budget) data, which is actively produced at periodic intervals according to professional norms and standards that provide for the aggregation of transactions and events into summary views or 'accounts.' Open data also differs from traditional financial data in terms of the inclusion or presentation of relevant contextual information. As the focus on 'raw data' would suggest, datasets released as open data are largely decontextualized. A limited amount of 'metadata' is provided to describe pertinent features or provenance of the dataset. To this end, the City's open data policy requires that the City "post on the Open Data website, an open Data License, procedures, supported file formats, glossary, and other dataset context information to promote responsible use of City of Toronto information" (CMS 002 2011, p. 3). But contextual information and interpretations of the data, including analytics and visualizations, are separate from the dataset itself. This allows users to engage with the data directly, to interpret and re-interpret the data and 'mashup' or combine it with other information sources to derive new insights, produce visualizations, and tell stories tailored to particular interests.

Financial information, on the other hand, is highly contextualized. The City's two cornerstone financial disclosures – the Public Budget Book and the Annual Financial Report – both contain hundreds of pages of materials that communicate the City's plans, priorities, and performance through a combination of numeric, narrative, and visual elements. Narrowing the view to just the Consolidated Financial Statements contained within the AFR, there are twenty pages of note disclosures to accompany the five pages of financial statements to provide the explanatory details required under PSAB guidance. These disclosures form an integral part of the financial information package and are not separable from the summary statements. Similarly, the Public Budget Book includes detailed budget notes (prepared in accordance with templates developed by the Finance team, rather than prescribed accounting standards) for each of the forty-four divisions included in the City's budget. Finance staff argue that these supplementary disclosures provide necessary detail and interpretation to interested users, explaining "in the spirit of transparency, we've got it all there in the budget notes. It's all there in the details" [M4].

These key financial documents are highly controlled communications – produced and approved through administrative and political channels with a view to deliver a consistent message to users. There is a reluctance to allow these information packages to be broken into their component parts and source datasets and thereby enable re-interpretation. Taking a position that is quite the opposite of open data principles or the open ethos, a senior Finance manager warns against external interpretation of budget data, citing the "absence of context." as a "danger of having somebody creating [an interactive budget visualization using City data] and not working here" [M4].

Differences in presentation format contribute, at least in part, to the technological formats used in the release of financial information. Traditionally, financial information was produced for physical printing and made available in hard copies at City offices. As electronic dissemination became the norm, these documents were 'printed' as a Portable Document Format (PDF). While PDF documents represent the simplest translation of hard copy reports, a combination of the two formats is commonly used. From an open data perspective, however, PDF formats represent only the minimum level of openness. They provide easy access to information in electronic format (via an open data portal or any other website) but are not machine readable. Their locked format renders it difficult to use the data in new ways or combine it with other data sources. This creates a problem for users who "have to scrape it and it's not necessarily in the formats that they want" [M1].

Difference #2 – purpose and use of financial information

Preference regarding disclosure formats leads into a second difference: the intended purpose and use of said information, particularly for engagement with interested parties, including relevant accountability forums. The financial reporting frameworks according to which highly structured financial disclosures are prepared take into account the needs of a set of hypothesized or "made up" users (Young, 2006). While acknowledging the hypothetical needs of a wide variety of potential users for general purposes, prescribed standards (i.e., GAAP) allow the producer of the account to retain control over the narrative surrounding the financial accounts and the interpretation thereof. From the Finance perspective, two key user groups include (i) the Council on whose behalf the budget is prepared and who vote to approve it and (ii) the public that Council represents and to whom City services are provided. Of these two groups, finance managers identify Council as the primary accountability forum: "… we have to serve Council. So whatever Council asks, that's our primary priority," while positioning disclosure mechanisms that support stakeholder engagement as a "nice-to-have" [M4].

The detail presented within traditional financial disclosures provide supplementary information on items included in aggregate or summary views. Using an onion metaphor to explain the various layers included within financial disclosures, one senior finance manager celebrated their reconcilability: "by peeling back an onion, you get more details even down to the numbers…if you were to add this column to that column and add in all 44 [divisions] it all adds.

It's amazing." [M4] Indeed, this detailed information all contributes to the aggregate view presented and its accompanying narrative interpretation, with finance managers showing concern that any information disclosed "aligns with whatever council has blessed and reviewed…we always want to make sure that there are no surprises to council" [M4].

The intention is to retain control over the numbers and their accompanying narrative. In the traditional approach to financial information management, the data owner retains control of the account and seeks to provide its own interpretation and contextualization. Open Data, on the other hand, invites use "by anyone for any purpose" (Open Knowledge Foundation, n.d.). It seeks to invite broad participation by both internal and external users in innovation (e.g., developing applications), operational efficiency (modernization), and accountability (informing and debating) processes by providing access to City data in disaggregated, machine-readable formats. The stated aim of the City's open data program to provide datasets that "can be used by anyone to re-use, re-purpose, and develop into digital applications for the benefit of the public" (CMS 002, 2011, p. 1) thus stands in contrast to traditional accounting information, which informs users through the accounts but does not necessarily promote engagement with the same. Whereas open data leaders within the City administration seek to respond to external users in the broader community who seek "more granularity in the release" [M3], financial managers are cautious about the use of their data by external parties:

> "The City is such a vast place…when you try to do apples to apples comparison it's very, very difficult… and the danger of somebody creating [an external website to analyze the budget] is the absence of context. So you do need those binders to sort of tell you [what's happening in the numbers]." [M4]

Finance managers seek to provide a simplified and interpreted view of the City's financial plans and priorities (i.e., budget) and position and performance (i.e., financial statements) to feed into debating processes, especially political processes such as those leading to budget approval. This simplified view allows users to apprehend and understand the information provided (e.g., given their cognitive limits – see Chapter 3) and is seen to "give better clarity to look at things strategically" [M5] more easily. This approach provides a more limited scope for engaging with the information provided in the debating process, to use the data to derive new insights or formulate alternate views. OD leaders, on the other hand, see aggregation as a means of controlling the narrative and limiting interpretation. Recognizing the reticence of data owners to provide decontextualized open data, they seek to enrol data owners in open processes by offering tools and templates that can "help divisions tell their story" [M3] through contextualization and visualization directly within the City's OD portal. Thus, OD leaders seek to engage both internal and external parties. From an external perspective, making data accessible fuels debate in that it "helps to ensure that the public is informed and engaged in open and accessible government" (CMS 002 2011, p. 1). Internally, however, it is presented as an innovative approach to storytelling. This latter approach can be seen as a strategy that aims to overcome resistance to open data implementation, which is discussed next.

Difference #3 – implementation and (potential) consequences of FIM practices

Given the differences discussed above in terms of preferred disclosure formats and appetites for engaging with users through open data, it comes as no surprise that the implementation of open data as part of routine administrative practice shows a marked difference between the City's financial managers and information managers charged with overseeing the City's open data program. Compliance with financial management processes is assured with relative certainty given its strong position at the centre of the administrative process. The vertical and hierarchical accountability structures in place for the City's financial management provide mechanisms for the forum to impose consequences on actors who do not comply with prescribed requirements. In the accountability relationship between the City and the provincial government, for example, the provincial minister "may retain any money payable to the City if the City or any officer of the City has not provided the Minister of Municipal Affairs and Housing with any information that the City or officer is required to provide under [the] Act" (City of Toronto Act 2006). Similarly, within the administration, central finance authorities hold the purse strings to the City's $13 billion-dollar budget. Thus, it can impose financial consequences on the divisions who do not comply with prescribed processes (and budgetary limits).

The OD policy sets out requirements and expectations with respect to open data. The policy marks an attempt to respond to more lateral or horizontal accountability obligations, suggesting alignment with the Toronto Public Service bylaw, which sets out expectations for all members of the public service to "serve the public service well" (lateral accountability) and "serve the public well" (social accountability) (Municipal Code, Chapter 192). To this end, the Open Data team positioned itself in close collaboration with and in service of the broader community (e.g., citizen groups, civic technologists, etc.). But these by-laws have no real enforcement mechanism or 'teeth' since there are no formal mechanisms for imposing consequences for non-compliance with the open data policy, thereby stifling lateral accountability. Senior levels of the public service (i.e., those to whom lower-level managers are most directly and formally accountable), thus present a potential barrier to OD in the City. As explained by one member of the ODT: "the upper levels who are the ones who approve budgets, and they need to be committed to it" [M1].

4.5. Discussion and conclusions

The empirical analysis of open data in the City of Toronto, particularly as part of its financial management practices, reveals two distinct orientations toward transparency in organizational practice: usability and understandability. Identification of these different orientations or approaches to transparency contributes to our understanding of open data as an informing practice, one that adds yet another instrument of accountability to the suite of informing practices mobilized within an organization's accountability regime. Figure 7 combines these two notions of transparency in a conceptual model for understanding transparency as informing practice(s) within open organizations. It can be used to situate and compare individual actors (or groups of actors) within the 'open' organization.

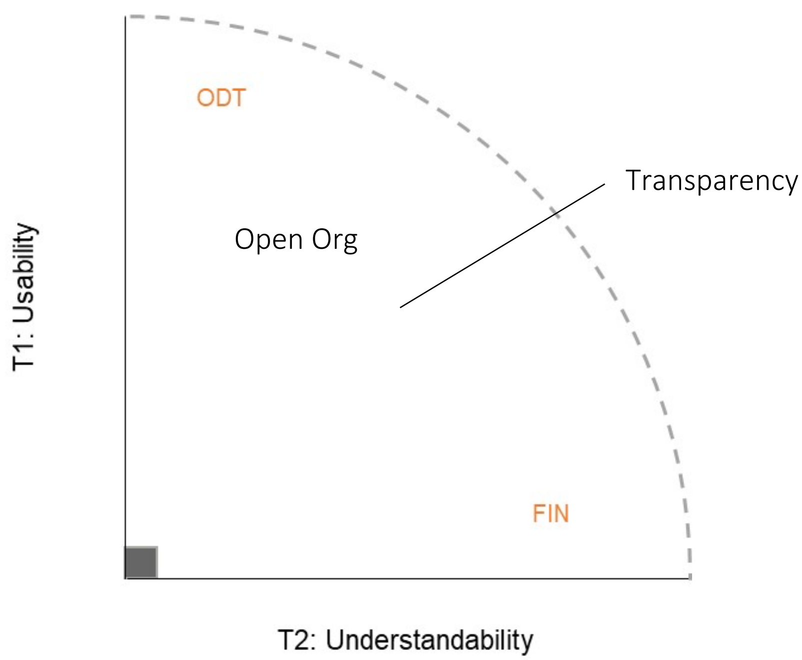

Figure 7: Transparency in Open Organizations

Usability refers to the technological and legal formats used to disseminate information that can be used, in the open sense, for any purposes. While 'open' release formats may not provide for immediate visibility as an end data product, they allow for inferences to be made through data processing, analytics, and visualization as data can be combined or 'mashed up' in innovative ways. Moving from low to high on the usability scale can be seen to follow the five-star open data maturity model (Berners Lee, n.d.) summarized below in Figure 8, which uses a rating system to indicate increasing levels of data openness:

Level (stars)	**Description**	**Example**
*	Make your stuff available on the Web (whatever format) under an open license	PDF
**	Make it accessible as structured data (e.g., Excel instead of image or scan of a table)	XLS
***	Make it available in a non-proprietary open format (e.g., CSV instead of Excel)	CSV
****	Use URIs to denote things so that people can point at your stuff	RDF
*****	Link your data to other data to provide context	LOD

Figure 8: 5-Star Open Data Maturity Model

Understandability refers to the ability to make inferences based on the information provided, with minimal need for further analysis and processing. This approach recognizes the practical and cognitive limits of data users to process information to make inferences, interpretations and informed decisions (and judgments). A low level of understandability will result from disclosures that provide visibility, but which result in information overloads or contain such technical complexity that average users cannot make inferences based on the information provided. Higher levels of understandability are reached when information is provided in less technical ways, using plain language and summary formats including visualizations. The 'understandability' dimension aligns with Heald's (2003, 2006) work on fiscal transparency, which distinguishes between 'nominal' and 'effective' transparency. According to Heald (2006), "for transparency to be effective, there must be receptors capable of processing, digesting, and using information" (p. 35). In this sense, information "processing" requires more than technology. From an understandability perspective, the ability to understand the subject matter contained within datasets as well as access to relevant contextual information is crucial for digesting and using information in meaningful ways.

This chapter set out to examine open data as an informing practice within a municipal accountability regime. It drew on evidence from a local case study of open government data in a municipal administration, specifically as part of the City's financial information management practices. It revealed a system of shared responsibility in which actors face multiple accountability demands and pursue different transparency practices. Two transparency orientations are reflected in the key actor groups examined in this study: the City's Open Data Team (ODT) and its Finance division (FIN). Their positioning in Figure 7 on opposite axes illustrates how the model can be used to understand and explain the apparent disconnect between two actor groups who both claim to endorse democratic principles of openness and transparency yet face tensions in their efforts to implement the organizational practices intended to deliver on these ideals.

Open principles and the practices taken up in their name (i.e., open data) reflect a social and lateral orientation toward accountability. But implementing these policies in organizational practice requires the participation of organizational actors who respond primarily through hierarchical mechanisms. This creates a situation of horizontal and lateral accountability operating "in the shadow of hierarchy," gaining significance through complex interactions with traditional forms of accountability (Schillemans, 2008). Contrary to the political rhetoric on openness, this empirical study of open data in local government shows that accountability and transparency cannot be understood as singular states or reduced to a simple relationship (either as "Siamese twins" or "matching parts"). To the extent that they become an "awkward couple" the unanimous embrace dissolves.

Chapter 5: Open data as an Instrument of Accountability – Assessing the Dialogic Potential of Open Data for Debate

5.1. Introduction

Building on the producer perspective of open data as an instrument of accountability developed in Chapter 4, this chapter adds the perspective of data consumers and users to consider OD in relation to debating processes within public accountability systems. As established in the Chapter 3 accountability framework, it considers the interaction between actor and forum to be a necessary element of democratic debate and examines the interactions between and within actor groups that collectively contribute to related accountability processes (including open data). Drawing insight from dialogic theory (Brown, 2009; Brown and Dillard, 2015), the chapter provides an interactions-based analysis of open data in a local government setting. Specifically, it considers if and in what ways open data is mobilized as an instrument of accountability in processes of debate between governments and their citizens.

By exploring how citizens utilize open government data as an instrument of accountability, the study questions whether and how interaction with and through open government data could create a channel of dialogic accounting (DA) to engage external stakeholders in accountability processes that mark a shift from traditional public accountability toward forms of critical dialogic accountability (Dillard and Vinnari, 2019). This is important for both academic research and practice. First, since the question of increased public accountability through open data is still an unanswered question, empirical studies are needed to aid our understanding of how this enhanced accountability is generated, if at all. Second, the issue of accountability through open data is an under-explored avenue for elected officials and unelected civil servants to answer constituents' calls for more accountability and transparency in 21st century democratic administration.

In this chapter, I use the accountability framework developed in Chapter 3 to theorize open data as a *debating* process (step 2 of the process model of accountability depicted within Figure 9) through which individual citizens and/or citizen groups engage with public officials and institutions in the realm of public financial management. I draw on theoretical insights from dialogic accounting (Brown, 2009; Brown and Dillard, 2015) to consider the potential of open data as an instrument of democratic accountability. Whereas DA aims to enable a diverse range of societal actors to account for things that traditional accounting ignores, dialogic accounts can be "used for decision-making and accountability purposes, and to foster debate in organizational and civil society settings." (Brown and Dillard, 2015, p. 250). Thus, recognizing the contested nature of accounting information, and given open data's defining characteristic as that which can be "freely used, modified, and shared by anyone for any purpose," (Open Knowledge Foundation, n.d.) a dialogic analysis provides a useful theoretical approach to identify and contrast the diverse range of goals and socio-political factors involved in producing, analyzing, and interpreting public sector accounting information (Brown, 2009; Tanima et al., 2020). The dialogic perspective adopted here allows us to question the apparent unanimous embrace of the open and ask if and how open government data can deliver on its lofty ideals, specifically with respect to public accountability. Recognizing that accountability is a goal of open organizational practice, I explore the potential for dialogic accounting to shape accountability relations between government reporting entities (i.e., the accountable actor) and stakeholders (i.e., the accountability forum), specifically the public.

The municipal level of government offers a rich field for studying open data in the public sector because of the close interaction between citizens and the administration (Kornberger et al, 2017; Goldstein and Dyson, 2013). Further, this level of government permits observing accountability relations "on the ground, in practice, in relation to mundane objects and technologies" (Woolgar and Neyland 2013, p. 14). The empirical analysis focused on the interaction (including materials exchanged) between two key groups: the City (i.e., the accountable actor and data producer) and members of the public and civil society groups (i.e., the accountability forum and data user). Data sources included documents and other materials produced by each group, participant observation, and twenty semi-structured interviews (see additional details provided in Appendices C and D). Data was analyzed and coded using relevant theoretical constructs identified in prior literature with a view to identify emergent themes in the data that provide insights on the dialogic potential of open data as an accounting tool used to hold governments and public officials to account.

5.2. Literature and theoretical development

Open principles appear to be aligned with dialogic principles. In the dialogic perspective, accounting has the potential to stimulate interaction. DA comprises the "engagement and involvement of multiple constituencies in projecting and developing innovative accounting tools and techniques that can gather, manage and report relevant and timely information"(Bellucci et al., 2019). This approach should allow stakeholders to be involved in decision-making processes and dialogue that could lead to the creation of shared platforms and possible solutions to problems associated with organizational conduct (Manetti et al., 2021). Dialogic accounting embraces a polyvocal citizenship perspective (Gray et al., 1997) that marks a shift from the monologic approach and any suggestion that 'the numbers speak for themselves.' The polyvocal citizenship perspective embraces stakeholder dialogue and attempts to provide each stakeholder with a voice in the organization. Thus, open data could be a promising tool for dialogic accounting and engagement. As noted in the Introduction, this is still open to empirical investigation. I turn now to the literature on public accountability and dialogic accounting that informs this empirical study.

Scholarly literature on open government and open data suggests that open approaches to organizing (including open data) increase accountability (Ubaldi, 2013; Wirtz and Birkmeyer, 2015). But this is often based on normative assumptions and implied cause and effect relationships. This section draws on accountability literature, together with the notion of dialogic accounting, to develop a theoretical framework that can help to investigate the relationship between open data and accountability in an empirical setting. Primarily developed in the field of public administration, accountability literature describes the process of public accountability as a multi-faceted and multi-dimensional process that encompasses a series of sequential phases (Bovens, 2007, 2010; Schillemans and Bovens, 2005; Sinclair, 1995). This literature provides descriptive and/or normative frameworks that deconstruct accountability relations along relatively formal lines using a series of interrelated analytical questions: who is accountable? To whom are they accountable? For what are they accountable? By which means are they accountable? To what ends are they accountable? These provide useful analytical frameworks, such as the one developed in Chapter 3 and presented in Figure 9. They help to deconstruct accountability into its multiple dimensions and identify the various components of an accountability relationship in each organizational context.

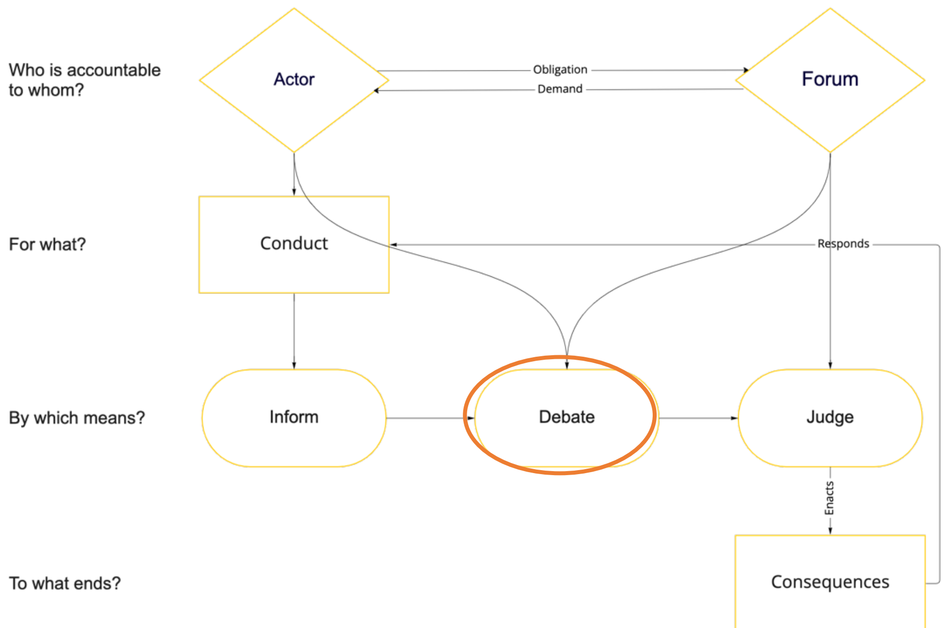

Figure 9: Theorizing Accountability: Open Data as Debating Process

On their own, however, frameworks such as the one presented above in Figure 9 do not provide the critical or interpretive lens required to understand how these accountability relations operate in social and organizational contexts or assess their ability to deliver on intended outcomes. The dialogic approach (Bebbington et al., 2007; Brown, 2009) adopted in this chapter seeks to problematize these elements and open them up to re-examination. The element of debate and the role of users and stakeholders (i.e., the forum) in related processes are the focus of this study. Specifically, I theorize open data as an instrument of accountability that has the potential to transform debating processes in line with dialogic principals of accounting and accountability.

Accounting technologies invariably lead to the production of an account (*informing* practice) and involve assumed or actual engagement thereon. DA rejects any notion of a universal narrative in favour of a view that sees institutions as being exposed to diverse perspectives and interests from its various stakeholders (Brown, 2009). As a techno-legal disclosure format, open data is understood as a mechanism through which information is made available in accessible formats for anyone to use "freely, for any purpose" (Open Knowledge

Foundation, n.d.). Although it is not an accounting tool per se, open data has the potential to support dialogic accounting systems by providing valuable information to stakeholders that allows them to assess the conduct (process and performance) of public officials and institutions.

Open data is understood as a techno-legal disclosure format through which information is made available in accessible formats for anyone to use. In this view, open data constitutes an *informing* practice. But the mere availability of information does not imply use or usefulness (Roberts, 2018). Users are not passive. Active use involves intentional and purposeful engagement with the data (accounting information) to understand, re-present, communicate, and debate. This understating of active engagement with the data in processes of sense-making and debate underlies the analysis that follows.

According to Gray et al. (1997), accountability itself is a “dialogic process that examines relationships between stakeholders and organizations” (cited in Bellucci and Manetti, 2017, p.875). Indeed, the model of accountability depicted in Figure 9 positions an accountable actor in relation to the forum to which they are accountable and shows the two parties engaged in debating the conduct (process or performance) of the accountable actor. Having assessed the available information and explanations provided, the forum then makes a judgment and has the possibility to enact consequences (sanctions or rewards) on the accountable actor who may, in turn, respond by adjusting their conduct (or not). There has been little exploration of stakeholder engagement in debating processes in prior literature. The literature on counter and shadow accounts, however, offers some insights. Here, we see engagement of civil society groups who produce their own accounts of an actor’s conduct. They often produce their own accounts using original data sources. But sometimes use (elements of) the actor’s original data/accounts for strategic purposes/effects. In open data, we see stakeholder engagement with the data itself through re-use and re-interpretation, specifically for the purposes of assessing the conduct of the actor and engaging in debate thereon.

Prior literature considers stakeholder engagement in establishing conduct criteria (i.e., norms, expectations) or in shaping informing practices (i.e., disclosure formats and contents) (Bellucci et al., 2019). Stakeholder engagement in open government data initiatives can be seen in instances where multi-stakeholder action plans/commitments are developed and where the release of open datasets is decided in response to external requests. Literature that looks at companies' pro-active engagement with external stakeholders to shape their disclosures would correspond to the *informing* process of accountability. Use of digital technologies by the reporting entitles themselves, would be a part of the informing process as well.

There has been less exploration of stakeholder engagement in *debating* processes. Dialogic accounting is suitable for investigating the role of stakeholders in debating processes because its aim to enable a diverse range of societal actors to account for things that traditional accounting ignores and to develop accounting that acknowledges divergent ideological positions. According to Brown and Dillard (2015) such accounts could be used to "foster debate in organizational and civil society settings" (p. 250). In this view, open data becomes a form of practice that can illustrate how accounting representations may be regarded and used as "elements of a conversation or dialogue, rather than as foundational claims asserting a particular kind of objectivity or 'truth"' (Brown, 2009, p. 484). Insights from dialogic accounting can help to explore the (mis)conceptions and practical implications of open data to enhance stakeholder engagement in public accountability and related democratic processes.

5.3. Empirical setting & methods

The empirical setting is a case study of open data in a local government, the City of Toronto, Ontario, Canada, (hereinafter, the "City") which is a rich empirical site to analyse the interactions between government officials and members of the public. Data sources included documents and other materials produced by each group, participant observation, and twenty semi-structured interviews. Data was analyzed and coded using relevant theoretical constructs identified in prior literature with a view to identify emergent themes in the data that provide insights on the dialogic potential of open data as an accounting tool that is used to hold government to account.

Empirical materials from the single case study (Yin 2009, 2018) were analyzed following a qualitative approach that features a close reading to identify key constructs and themes that may shed light on the research questions. The analysis was conducted in stages. A first reading aimed to identify interactions between stakeholders engaged in public accountability processes, in particular those featuring the production and use of open data. The interactions were coded according to the key groups (i.e., elected officials, civil servants, public) and sub-groups (e.g., civil service – Finance team, civil service – Open Data team, etc.). Second, these interactions were analyzed to identify dialogical attributes and/or principles exemplified. Key themes for consideration were drawn from prior literature, in Brown's (2009) dialogic principles:

(2009) Principles of Dialogic Accounting (Brown, 2009)

- P1 Recognition of multiple ideological orientations
- P2 Avoiding monetary reductionism
- P3 Openness about the subjectivity and contestable nature of calculations
- P4 Enabling access for non-experts
- P5 Ensuring an effective participatory process
- P6 Attention to power relationships and their dynamics
- P7 Recognizing transformative potential
- P8 Resisting new forms of monologism

Figure 10: Principles of Dialogic Accounting

The basic claim in the OD community is that open data leads to increased accountability. More specifically, that data released in open (i.e., 'raw,' machine-readable) formats, will facilitate use by internal and external stakeholders and, thus, contribute to accountability. But this causal link implies and requires use of the newly released data for intended purposes (i.e., accountability). And that this use is effective in shaping the intended outcomes (i.e., increased accountability). To interrogate these claims and assumptions, I analyzed the case study data with the following questions in mind:

1. *Are external stakeholders (i.e., the public) aware of the City's OD? Does the public use the City's OD?*
2. *Is the City's OD used for accountability purposes? Specifically, in debating processes?*
3. *In cases where interaction and dialogue are found, is it dialogic/collaborative (dialogic) or oppositional/agonistic (monologic) in nature?*

The coding structure was based on the eight dialogic principles listed in Figure 10. First, segments indicative of one of the dialogic principles were coded P1 through P8. Second, each segment was coded as supporting (Y) or opposing (N) the applicable dialogic principle. In certain cases, the text indicated both support and opposition (YN), while in others the text made general reference in line with a dialogic principle but not indicating any form of support or opposition (NA). Finally, each segment was assigned an interaction type based on the specific actors and/or content involved. Thirteen potential interaction types were identified using the Venn diagram shown in Figure 11 which separates the two key organizational practices of interest ('open' and 'data') and the two key actor groups (Government and Citizen) linked in the accountability relationship.

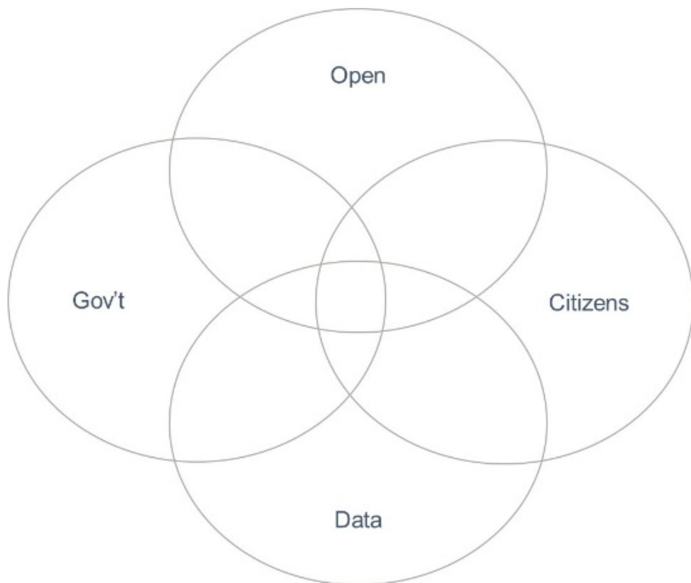

Figure 11: Interactions in the Production, Dissemination, & Use of (Open) Data

5.4. Empirical analysis & findings

Key findings to emerge from the theoretically informed analysis are presented and discussed in this section in relation to the eight principles of dialogic accounting.

Recognize multiple ideological orientations (P1)

Multiple ideological orientations are evident in the case study data, with open advocates within and outside of government advocating for information dissemination practices that, in line with dialogic principles, for example those included in the International Open Data Charter (see Appendix B) "facilitate the expression of different perspectives to encourage individuals and groups to engage in democratic interaction across perspectival borders" (Brown, 2009, p. 324). The *usability* orientation of transparency identified among open data practitioners within government in the Chapter 4 analysis of municipal financial management practices, is seen in the present analysis to extend to the broader 'open' community (i.e., among citizens) as these actors push for disclosure formats that enable actors to express their claims and points of view in their own voices and according to diverse perspectives (Brown, 2009). The *understandability* orientation reflected in the Finance actor group, on the other hand, suggests a reluctance within the municipal administration to empower stakeholders to " 'account' differently" for things (Brown, 2009, p. 324). Differences between OD and other areas of organizational practice, including, but not limited to Finance, are often considered 'cultural' as indicated in the following quote from a member of the City's Open Data Team:

> "…a lot of that thinking exists, not just in the City of Toronto but in government. And to me, it's cultural. It's the thinking that used to be, 'which is 'we know better' and literally 'we will tell you'… It's more an attitude thing than anything else. But to try to fight that inside was really difficult. I was the kind of employee who would kind of rattle the chains a little bit. But there was just so much inertia that 'that's the way we do it.' Live with it. And no, you're not going to get to get it to the open data site'" [G1].

As a 'new' approach to bureaucratic administration, open data is positioned in contrast to 'old' approaches, which are seen as barriers to openness, and which prevent dialogic engagement both within the institutions of government and in government-citizen interactions.

Avoid monetary reductionism (P2)

Dissemination public sector information (PSI) as open data is, by its very nature, reductionist. In the process of releasing PSI as open data, complex subject matter detail is reproduced in highly structured, quantitative, machine-readable formats. By focusing on the technical features of the dissemination formats, OD obscures the "contested terrain" (Brown, 2009, p. 324) within the datasets (i.e., the subject matter). In translating original source data from a given domain of organizational practice (i.e., PFM) into open formats, relevant information on the provenance of the data and contextual information pertinent to its interpretation fall from view.

The City's key budget document, the Public Budget Book, for example, consists of a 500+ page PDF document which presents the City's operating and capital budgets. In addition, the Public Budget Book includes key messages from senior political and administrative officials (e.g., the Mayor and Chief Financial Officer & Treasurer), provides contextual detail on the City and its financial context (e.g., socio-economic indicators, financial policies, revenue sources, capital market activities, etc.), and outlines applicable governance frameworks (i.e., the Integrated Framework for Planning and Performance) and financial management policies. The Public Budget Book provides both a City-level summary or aggregated view in addition to the budgets for each Division and Agency. Budget data disseminated through the City's OD portal, on the other hand, consists of two primary datasets available for download in Excel file formats (.xlsx): operating budgets and capital budgets. These present the budget data for each line item (dollar amounts) for a given year, indicating the corresponding Division (Program), Service, and Activity to which the budgeted amount relates as well as the applicable revenue/expenses classifications. Aggregate revenues of over $13 Billion are disaggregated by Division, category and sub-category and presented in approximately 1,600 individual lines. Similarly, expenses of an equal amount are disaggregated in almost 20,000 individual line items, as illustrated in Figure 12. A complete single-year operating budget dataset presented in open data format (i.e., an Excel spreadsheet) contains approximately 20,000 numeric values ($), with seven organizational and financial classifications denoted for each, as shown in Figure 12 for a sample of line items for the year 2019.

Program	Service	Activity	xpense/Reve	Category Name	Sub-Category Name	Commitment item	2019
Court Services	Default Fine Collection Management	Default Fine Collection Management	Expenses	Service And Rent	Meetings	Bus. Meeting Exp	85.00
Court Services	Default Fine Collection Management	Default Fine Collection Management	Expenses	Service And Rent	Postage	Postage	12,060.08
Court Services	Default Fine Collection Management	Default Fine Collection Management	Expenses	Service And Rent	Professtional & Consu	Prof & Tech - IT	413.61

Figure 12: City of Toronto Open Budget Data Extract

Beyond differences in the technical format (PDF vs. XLS) of the two types of budget disclosures (Public Budget Book vs. Excel datasets), there are significant differences in the volume and nature of content contained in each. OD advocates and users are unaware of the qualitative and contextual information that is contained within the more detailed Public Budget Book document but 'missing' from the open budget datasets. Open data thus puts the onus on users to be aware of its limitations and seek out complementary information sources to understand, analyse, and interpret data released in open formats more thoroughly.

Be open about the subjective and contestable nature of calculations (P3)

Despite the stated aim of open policies to invite participation in open, transparent discussion, the reductionist nature of OD risks contributing to the "false promise of determinacy and the pretense of objectivity" (Brown, 2009, p. 325) that DA cautions against. Thus, from a DA perspective, OD can have the opposite of its intended effect: instead of enhancing democratic decision-making it may in fact pose a threat thereto. This is especially true of financial (accounting) data, which, on its own, has been criticized for its tendency to promote a realist view of financial calculations. Accounting scholars have worked to dispel this technocratic view of accounting as an objective presentation of reality, and instead draw attention to the socially constructed nature of accounting "facts" (Vollmer, 2003). Prepared in accordance with GAAP, traditional accounting disclosures such as financial statements make reference to the principles and assumptions on which the accounting values are calculated, even if remaining silent as to their subjective and contestable nature. Each page of the City's audited financial statements includes the disclaimer that "The accompanying Notes and Appendices are an integral part of these Consolidated Financial Statements." Disclaimers such as this point users toward complementary information sources that enables them to read and question the underlying policies and assumptions on which financial calculations are based. Such openings are lost in the translation to and dissemination as open data. OD thus layers one technocratic approach onto another: accounting 'facts' become further reified as they are re-presented as open or 'raw' data, leading non-expert users to believe that "the data is there waiting for you to comb through it, clean it up, and process it" [C3].

This technocratic layering further obscures the subjective and contestable nature of accounting data and hinders interpretation:

> "…what seemed like it should be a relatively straightforward technology exercise...did reveal greater challenges, in the sense making part of it. Not just the technical code writing, but in making sense of where these numbers come from and what they mean" [G4].

Again, this places the onus on OD users to identify and question the underlying calculations – where the numbers come from and what they mean. The case study data provides evidence that some users and communities of interest do indeed undertake to illuminate the contested terrain of accounting information. As users engage more deeply with specific data types (i.e., PFM data) and formats (open and otherwise), the reality that 'there is no such thing as raw data' (Davies and Frank, 2013) starts to become clearer. This suggests that open data, combined with other information sources, can be used to contest and expose inconsistencies. It also forms a basis on which users can attempt to engage decision-makers and draw attention to accounting policies and practices they perceive as problematic or against their interests (or at least impeding their ability to assess their interests).

Enable accessibility for non-experts (P4)

DA requires that information be provided in multi-layered ways that meet the needs of a range of expert and non-expert users (Brown, 2009). As an informing practice, OD enables access to City data by disseminating information in "open" formats, that is, with specific techno-legal attributes. OD thus improves access for a certain group of users – those with the technical skills and expertise needed to perform independent analysis of the datasets. Tech-savvy users acknowledge that the accessibility of the City's data "has gotten better" [C8], in particular as published on the City's OD portal, but lament that "still most stuff is provided in PDF" [C8]. The key feature sought by these users is granularity:

> "… depends on the level of granularity of the data, right? Because you can issue reports that interpret your financials but are you going to make available the underlying raw data that enables citizens, or whichever groups, to start developing their own analysis?" [C9]

Access to granular data in open techno-legal formats, however, will not resolve all access issues for all users. First, many users lack the technical skills (and/or time and interest) to perform analyses on open data. Second, the skills and expertise that enable data processing from a technological point of view do not necessarily extend into the content or subject matter domain. Indeed, accessibility is more than a techno-legal issue. Users, even those with advanced IT skills, require assistance to understand and interpret data to engage in informed debate with experts. As a member of one citizen-group explained,

> "that's actually one of the weaknesses with [our group] … no accounting understanding of what's going on, because it's like, 'Well, is this right? Is this wrong?' I don't know. I don't know accounting standards." [C4]

This assistance may come from within the stakeholder community (i.e., citizens with accounting expertise) and/or from the data-producing entities themselves (government or professional bodies). As one municipal official put, the cross-functional expertise required demands that "accounting has got to start moving their formula of what an accountant is to be one that says, 'I can handle data,' and the data relates to the accounting at the end of the day" [M5]. Citizen users remain skeptical as to the willingness of municipal finance authorities to provide such access, suggesting that they instead "do a good job of actually trying to obfuscate things…the documents are so poorly written because they don’t want anybody to read them. They are purposefully boring and long and obfuscate what’s in them” [C3].

Ensure effective participatory processes (P5)

DA seeks to expand the range of voices that cand be heard in organizational and societal discourse and enable stakeholders to express diverse views (Brown, 2009). The City’s OD policy contributes to this by establishing OD as a “dialogic entitlement” (Brown, 2009, p. 326), along with existing rights to information and participation set out in existing legislation (e.g., City of Toronto Act – financial disclosure/engagement requirements; freedom of information laws, etc.).

The City’s ODT appears to embrace the principles of openness and dialogic engagement in their efforts to implement this policy. They involved stakeholders early in the process, laid out a process for opening city data and made all artifacts from this process publicly available.

> “…we invited members of the public alongside City staff to join us in a small room to kind of hash out a best practice guide for open data. And we looked at all different aspects of open data, like identifying data sets, preparing data sets for publication, releasing it and activating it in the community… one of the memorable moments from that event was someone walking out of there saying, ‘You know, I couldn't really tell who was a public servant and who was member of the public’” [G3].

Members of the ODT expressed their commitment to openness, contrasting their approach against the traditional approach in which policy is:

> “…developed behind closed doors, in the walls of government. And then, eventually, it becomes exposed to the public but at a point where it's kind of a little bit too late to share public input or get, solicit public input. We took a different approach to it, and we wanted to ensure that all the steps throughout the process of developing this plan was co-developed with the community and it was done in a transparent way” [G3].

The participatory approaches taken by the City’s ODT were acknowledged by community members. Referring to the release of the City’s Open Data Portal, for example, one community member praised the ODT for doing “such an amazing job of listening to what the audience needed” and giving credit that “they did it the right way” [C5].

But the practices of a single actor or actor group (i.e., ODT) cannot be taken as representative of the entire organization and the myriad practices and interactions that, combined, make up its accountability regime. If OD is to be used as a tool of dialogic accounting that fuels engagement, it must be mobilized organization-wide with a view to produce broader structural change. Indeed, for participatory processes to be effective, the right people need to participate. This requires participation from beyond the ‘open’ community within government (i.e., ODT) to include the data producers as domain-level experts (e.g., FIN). The interview data showed persistent efforts on the part of actors from the ‘open’ community (both within and outside government) to “get people from the divisions to show up… because we didn’t have the content expertise and we didn’t have the data” [G1].

While some Divisions were identified as being early contributors and participants, significant resistance was noted for others, including the Finance Division. Finance’s resistance to dialogic engagement through OD is unsurprising when considered as an extension of pre-existing budgetary processes, which are themselves criticized for being tightly controlled and providing limited opportunities for substantive engagement:

> “staff have now proposed that they codify in municipal bylaw that the budget process would consist of a single meeting of the budget committee involving a launch in the Spring, followed by the entire summer of budget development behind closed doors by staff, followed by the emergence of a fully formed budget in October, which would be reviewed through 5-minute deputations, in bulk – way too much, in a few budget committee meetings, 2 or 3. I think it’s a disgrace. I’m appalled – not only because it is not democratic, which is important, but I’ve come to believe that collaboration leads to better outcomes. And this process is designed to supress collaboration” [C1].

Be attentive to power relations (P6)

Attention to power dynamics, including those noted above in relation to open data and financial management processes, is essential for developing inclusionary participatory processes. Hierarchical governance structures and their influence on municipal administrative practice was clear in the interview data for implementing ‘open’ policies (i.e., informing practices, publication of open datasets) across the organization. As explained by a member of the City’s ODT“we needed that kind of evidence [of senior-level support] so that we could say on the phone to people ‘you know the mayor is behind this’…” [M1].

Beyond appealing to hierarchical authorities, open advocates in government aligned with outside stakeholders to spur horizontal engagement across municipal Divisions:

> “You gotta start somewhere and in the absence of all these divisions not doing it as a regular practice now, you would have to pick and choose the issues. Kind of identify, maybe with the help of the community, outside communities, on what data sets they would want to get” [M4].

Quotes such as this indicate that, in line with dialogic principles, the combination of insider and outsider forms of engagement is used to further the open agenda. However, given the "inherent aura of objectivity" (Brown 2009, p. 326) surrounding accounting data, which is reinforced yet obscured through its dissemination as open data, existing power dynamics remain. While the public lacks an appreciation of the contestability of accounting information (in all formats, open and otherwise), there is evidence that OD is used by grassroots groups, sometimes with the support of government 'insiders' (i.e., the ODT) to draw attention to and contest accounting methods/methodologies. To the extent that organizational actors (i.e., FIN) use their positions of power/authority to resist engaging with outside "communities of interest" (Bebbington et al., 2007, p. 370), meaningful discussion and debate remains elusive.

Recognize the transformative potential of dialogic accounting (P7)

Whereas dialogic accounting aims to encourage social actors to become more critically reflective and to facilitate better talk across groups with different perspectives, monologic approaches promote a " 'banking' concept of communication in which speakers 'deposit' their belief, values and assumptions into the heads of others" (Brown, 2009, p. 327).

To the extent that OD is used as an informing practice to disseminate existing accounting in new techno-legal formats that leave implicit or further obscure underlying beliefs, values, and assumptions, it cannot be expected to contribute to the transformative potential of DA. However, as social actors use OD, in combination with other sources of information, knowledge, and expertise, to become more critically reflective and continue to push for greater discussion, debate and horizontal dialogue, the transformative potential of OD as a tool of DA remains possible.

> "Without a doubt the solutions that I put forward are incomplete and need to be revised and are developed in the absence of insights that are important and should change those things, I recognize that. I'm very open to that, but none-the-less, in the short-run I think all we can do is articulate those, communicate them through various means – to committees, to individual councillors, through Tweets, to the public… the fact is at the moment, I think the best we can do is articulate the issues… moving forward it's really a matter of resources, political realities, persistence. What I'm told, somewhat cynically, is that realistically, we should expect that when the current batch of senior managers in the financial area of the City retire and are replaced by more modern-minded millennials, then things will change" [C1].

Resist new forms of monologism (P8)

Some scholars argue that dialogic tools are best viewed as "trampolines for constant enquiry" rather than technical innovations (McAuley, 2003 cited in Brown, 2009, p. 328). Viewed as a techno-legal artifact supported by modern technologies and organizational processes, OD risks replacing one form of monologic accounting (traditional PFM) with another (OD) or combining the two in a new form of monologism. A risk in the OD community is that advocates and practitioners' whole-hearted belief in 'open' principles may leave them blind as to its limits. Even where the data shows users engaging critically, they may be seeking to 'fix' the accounting or 'get it right' suggesting the belief in an elusive single – better – approach. Used as a 'trampoline for constant enquiry' however, OD may contribute to dialogic engagement by encouraging social interaction and learning – discussing and debating one's own and other peoples' interests and values.

5.5. Discussion & conclusions

This empirical analysis of open data in the City of Toronto's municipal administration confirms the alignment between open principles – established in international governance circles and adopted in organizational policy – and the theoretical principles of dialogic accounting. As a techno-legal artifact, however, open data does not, on its own, constitute dialogic accounting. By its very nature, open data is reductionist. In producing seemingly objective 'facts,' open datasets reduce complex subject matter to largely quantitative artifacts that omit relevant contextual detail and remain silent on the principals, values, and assumptions on which the calculations are based. While this may be appropriate for some types of data – public transit schedules or geo-location data, perhaps – the layering of open practice as a technocratic approach to information sharing atop existing public financial management practices may serve to further the false sense of objectivity already associated with accounting figures.

Whether seen as a replacement for other types of information (e.g., by open advocates and practitioners), or simply a technological extension of current financial management practice (i.e., by finance professionals), open data may have the opposite of its intended dialogic effect. Viewed in these ways, OD is more likely to be mobilized in ways that reinforce existing 'monologic' accountability systems. Instead of being used to realize its transformative potential to challenge the status quo and promote a shift toward dialogic forms of accountability, open data may simply reinforce existing monologic accounting practice, adding "a little bit more" (Dillard and Vinnari 2019, p.20) to the traditional public accountability processes.

Thus, open data is at best a 'partial' tool for dialogic accounting. Indeed, it provides new forms of access for users with the requisite technical skills and expertise, enabling them to perform independent analysis efficiently to produce interpretations that, in turn, engage other stakeholders and/or fuel discussion and debate with the with accountable actors (i.e., government officials). For open data to be mobilized in a dialogic manner, however, it must be combined with other information sources that fill knowledge 'gaps' that open datasets cannot. Specifically, relevant qualitative and contextual detail must be considered to understand, explicate, and effectively critique the accounts produced and disseminated through political process that invariably favour powerful actors and support dominant interests.

This study contributes to both research and practice. This study contributes to the research on dialogic accounting by providing an empirical analysis of the dialogic potential of a novel accounting practice that illustrates how dialogic principles can be assessed in a specific organizational context. To both dialogic accounting and to the broader literature on accountability (i.e., in public administration), it contributes a unique perspective by looking at the debating processes which are identified in prior theoretical work but largely unaddressed in prior empirical work.

To practice, the study provides insights that may guide open data advocates and practitioners such that their efforts are invested in the areas that are most likely to bear fruit. Specifically, it suggests points of interaction where 'open' and 'data' principles and practices are most closely aligned and where stakeholders inside and outside of government are mostly likely to find common ground. It also highlights points, particularly in the financial management domain, where interactions are likely to be more challenging and where actors may look to employ tools and strategies to overcome barriers and navigate tensions and/or challenges related to information sharing.

Accounting researchers, largely absent from the open data conversation to date (as evidenced in Chapter 2), also have an opportunity to contribute to practice with a view to promote dialogic engagement. Specifically, accounting researchers can offer their subject matter expertise to help develop cross-functional (*open* technologies + *accounting* data) expertise within communities of interest in a way that acknowledges and draws attention to the subjective principles (i.e., GAAP accounting standards) and contestable nature of numbers they are used to produce. Accountants and accounting researchers can help to dispel the myth of accounting objective 'facts,' with a view to counter mainstream approaches and dominant narratives by fostering alternative approaches and interpretations.

Chapter 6: Conclusion

This dissertation set out to explore the relationship(s) between open data and accountability in democratic governance, specifically in relation to public financial management. Having observed accounting's notable absence from the burgeoning field of 'open' organization, I undertook to critically examine open government data as a new approach to administrative practice with two overarching questions in mind. First, how does open data combine with and/or extend existing the institutional arrangements for financial management (e.g., accounting and budgeting) that are in place to serve the same or similar ends, including accountability? And second, (how) does open data deliver on its promise to increase (public) accountability?

The four substantive chapters (Ch2 – Ch5) in this dissertation build on one another to accomplish these research objectives. Following the introduction to the empirical and theoretical phenomena of interest in Chapter 1, Chapter 2 reviews the literature on open government data and serves to substantiate the observed disconnect between OGD and accounting research. It identifies gaps in the current literature to which this dissertation and continued research in this area can contribute. Given the vague and multi-dimensional nature of 'good governance' constructs such as openness, transparency, and accountability, Chapter 3 set out to review the literature on accountability and transparency to understand the relationship(s) between and develop a theoretical lens through which open data could be studied from an accountability perspective. Building on Bovens' (2007) definition of accountability, the chapter presents a framework for understanding accountability (and transparency as both an object and instrument thereof) and uses this framework to propose three theorizations of OD from an accountability perspective. In so doing, Chapter 3 provides the theoretical and analytical foundations for the empirical studies of open data that follow in Chapters 4 and 5.

The studies presented in Chapters 4 and 5 both draw from empirical materials including documents, interviews, and observations gathered as part of a case study that looked at open data in the context of financial information management in the City of Toronto. The two chapters aim to provide distinct yet complementary views of open data in relation to the City's financial management practices. In theorizing OD as an *informing* practice, Chapter 4 provides a producer-level view that identifies OD as a new aspect of *conduct* for which municipal actors have become accountable, and considers OD alongside the organization's existing *informing* practices. It identifies two distinct transparency orientations – usability and understandability – that help to explain tensions and/or barriers in efforts to implement open policies as part of an organization's broader accountability regime and governance structures.

To this, Chapter 5 adds a user-level perspective by theorizing OD as an instrument of accountability with the potential to reshape public accountability through *debating* processes. It draws on theoretical insights from dialogic accountability (Brown, 2009; Brown and Dillard, 2015) to question if and how OD can serve as a tool for dialogic engagement that transforms traditional public accountability arrangements in favour of more dialogic forms of accountability. It finds that while there is a clear alignment between OD and dialogic accounting in terms of their principles, a cautious optimism is warranted. First, given its inherent limitations as a techno-legal artifact, OD cannot, on its own, respond to all principles of dialogic accounting. It is at best considered a partial tool that, if properly combined with other information sources, may form part of a DA toolkit. Second, and perhaps more importantly, this study draws our attention to the nature of interactions between and among actors joined in accountability relationships and engaged in processes of debate. For accounting tool(s) such as open data to be used to fuel dialogic engagement, they must be used dialogically – and willingly – by the actors involved. Thus, while some interactions show the potential for OD to be used as a tool of dialogic accounting and to promote dialogic forms of accountability, some users and uses may equally support the continuation of existing accounting practices and traditional monologic forms of accountability.

This dissertation provides an opening for further research at the intersection of accounting, accountability, and open data. First, the accountability-based analytical framework and proposed OD theorizations can be used to guide future studies on specific aspects of OD practice and/or use of OD in specific organizational settings. Looking, for example, at the types of data contained within open data portals and/or their use by specific forums in targeted debates (i.e., on specific issues). In addition, accounting research can contribute to the dialogic potential of open data by helping to dispel the myth of 'raw' data that circulates within practitioner communities. Building on prior research on the subjective and contestable nature of accounting calculations, accounting researchers can help to ensure that social and political conditions under which numbers are produced and disseminated are not obscured in well-intended efforts to bring the numbers themselves into clearer view.

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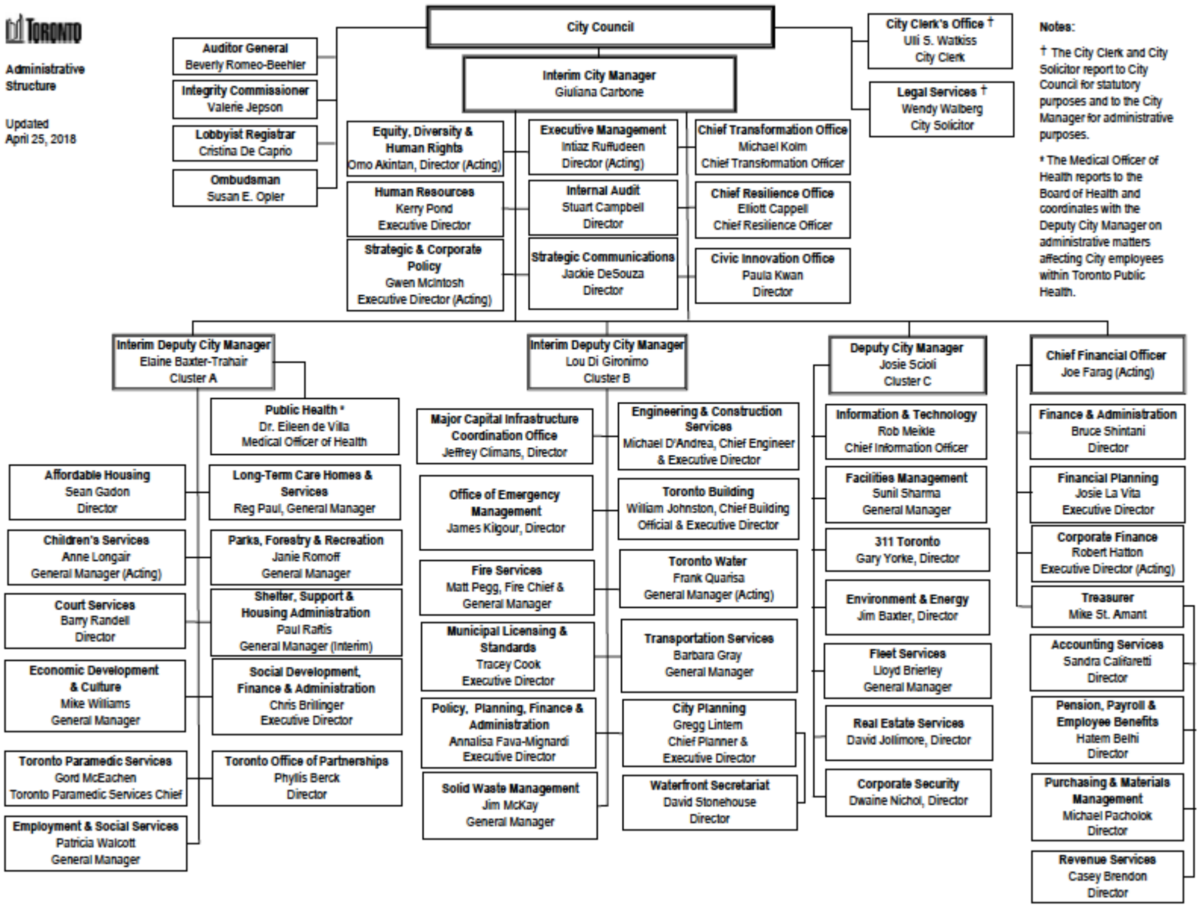
Appendices

Appendix A: City of Toronto Organization Chart



Appendix B: International Open Data Charter Principles

The six ODC principles were developed in 2015 by governments, civil society, and experts around the world to represent a globally-agreed set of aspirational norms for how to publish data. Below is an informal explainer of the 6 Principles:

1. Open By Default

This represents a real shift in how government operates and how it interacts with citizens. At the moment we often have to ask officials for the specific information we want. Open by default turns this on its head and says that there should be a presumption of publication for all. Governments need to justify data that's kept closed, for example for security or data protection reasons. To make this work, citizens must also feel confident that open data will not compromise their right to privacy.

2. Timely and Comprehensive

Open data is only valuable if it's still relevant. Getting information published quickly and in a comprehensive way is central to its potential for success. As much as possible governments should provide data in its original, unmodified form.

3. Accessible and Usable

Ensuring that data is machine readable and easy to find will make data go further. Portals are one way of achieving this. But it's also important to think about the user experience of those accessing data, including the file formats that information is provided. Data should be free of charge, under an open license, for example, those developed by Creative Commons.

4. Comparable and Interoperable

Data has a multiplier effect. The more quality datasets you have access to, and the easier it is for them to talk to each other, the more potential value you can get from them. Commonly-agreed data standards play a crucial role in making this happen.

5. For Improved Governance & Citizen Engagement

Open data has the capacity to let citizens (and others in government) have a better idea of what officials and politicians are doing. This transparency can improve public services and help hold governments to account.

6. For Inclusive Development and Innovation

Finally, open data can help spur inclusive economic development. For example, greater access to data can make farming more efficient, or it can be used to tackle climate change. Finally, we often think of open data as just about improving government performance, but there's a whole universe out there of entrepreneurs making money off the back of open data.

Source 1International Open Data Charter Principles (2015). Available at: https://opendatacharter.net/principles/

2

Appendix C: List of Documents

The document review included detailed analysis of City documents relating to accountability, information management, financial management, and open data. The review began with the City's founding legislation (the Constitution Act and City of Toronto Act) which set out the powers of the City within Canada's federal system of government. At the municipal level, the City bylaws are the primary legislative instrument. These were reviewed to establish the key roles and responsibilities in relation to information management and financial management. Finally, a more detailed review of materials documenting the evolution of information and financial management practices was conducted. These materials included, but were not limited to, staff reports, submissions to council, public deputations, websites and press releases. Materials were identified through general web searches and targeted searches within Toronto's Meeting Management Information System (TMMIS). Finally, searches were performed in the City's Open Data catalogue itself to identify datasets available as OD and compared to data available through other channels (e.g., TMMIS and webpages).

Note that while fewer in number, the documents coded as FIN (i.e., budget book and annual financial reports) contain much more content than the OGD documents listed in the table below and contain material from sources across the organization, such as budget notes prepared by individual divisions and political messages from the mayor. These documents were reviewed with particular attention to transparency and accountability messaging and to identify links to and mentions of OD/OG.

List of Documents Reviewed

Type	Domain	Document
Legislation	Federal	The Constitution Act (1967
Legislation	Provincial	City of Toronto Act
Legislation	Provincial	Municipal Freedom of Information and Protection of Privacy Act
Legislation	Municipal	City of Toronto Municipal Code
Legislation	Municipal	MC Chapter 1: General Provisions
Legislation	Municipal	MC Chapter 2: Accountability Officers
Legislation	Municipal	MC Chapter 3: Financial Control
Legislation	Municipal	MC Chapter 169City Officials
Legislation	Municipal	MC Chapter 192: Public Service
Legislation	Municipal	MC Chapter 17: Records, Corporate (City)
Other	General	A guide to Municipal Accountability, Transparency and Confidentiality in Ontario
Other	General	Municipal Benchmarking Reports (2014, 2016, 2017)
Other	General	Code of Conduct for Members of Council
Other	OG/OD	Toronto Open Government Progress Report
Other	OG/OD	Toronto Open Government in Open Spaces
Other	OG/OD	Toronto Open Government Surveys (academic, staff, public)
Other	OG/OD	An Introduction to Toronto's Government
Other	OG/OD	Open Data Master Plan, 2018-2022
Other	OG/OD	Open Data Master Plan, 2018-2022 Stakeholder and Consultation Attendees List
Other	OG/OD	Open Data Master Plan, 2018-2022, Attachment 3
Other	OG/OD	Report from the Deputy City Manager, Internal Corporate Services, and the Chief Information Officer on Toronto's Open Data Master Plan
Other	OG/OD	Open Data Master Plan Update Report (2017)
Agenda Item	OG/OD	World Class Digital City - Open Data Strategic Plan (2016)
Other	OG/OD	Progress Report on Open Data Strategic Plan (2016)
Other	OG/OD	Report from the City Clerk and the Chief Information Officer on Open Data in the City (2016)
Other	OG/OD	Open Data in the City - Committee Decision (2016)
Other	OG/OD	City's Open Data Program - Committee Decision (2016)
Other	OG/OD	Leveraging Data to Make Toronto Government More Open and Transparent (2014)
Other	OG/OD	Open Government License - Toronto
Other	OG/OD	Open Data Llicense - Toronto
Other	OG/OD	Toronto Open Data Policy (2011)
Press Release	OG/OD	City of Toronto launches new Open Data Portal (2018)
Press Release	OG/OD	City of Toronto invites innovators to help improve recreation through open data (2016)
Press Release	OG/OD	Apps4TO competition harnesses open data for innovation and economic development (2015)
Committee Decision	FIN	2021 Annual Controller's Report (2022)
Committee Decision	FIN	2018 Audited Financial Statements
Staff Report	FIN	Report to the Audit Committee on transparency in the city's financial information (2019)
Other	FIN	City of Toronto Capital and Operating Budgets
Other	FIN	City of Toronto Public Budget Book (2015-2022)
Other	FIN	Operating Budget Policies
Other	FIN	City of Toronto Annual Financial Reports (2017-2021)
Press Release	FIN	Toronto Budget
Other	FIN	Close-out of the Financial Planning Analysis and Reporting System (FPARS) Project (2021)
Other	FIN	Operating Variance Report for the Year Ended December 31, 2021

Appendix D: List of Interviews

Twenty interviews were conducted with a total of twenty-one participants. Two individuals were interviewed twice. Two interviews were held with more than one participant (2 and 3) at the request of the interviewees; these included team members who worked in the same area.

The City's governance model includes three groups: the public, who are represented at the political level by members of the City council (councilors), and the administrative staff who implement council decisions and deliver programs and services to the public. The sampling strategy sought to include representatives from each group. The public grouping aimed to identify and include individuals with a demonstrated interest in civic tech issues and, specifically, using the City's financial data (e.g., members of Budgetpedia and the Open Data Book Club).

Summary of interview data	
Total interviews	20
Total interviewees	21
Of which:	
Government - City Councillors	3
Government - Financial Administration	4
Government - Information Management & Open Data	6
Public - Citizen Groups	7
Public - Resident (no affilation)	1
Minutes	1,204
Hours	20
Pages	357
Words	188,201

A detailed interview listing follows on the next page.

List of Interviews Conducted

Index	Group	Organization	Position/Unit	Words
C1	Public	Citizen Group	Founder	13,700
C2	Public	Citizen Group	Member	8,624
C3	Public	Citizen Group	Member	13,190
C4	Public	Citizen Group	Member	8,410
C5	Public	Citizen Group	Founder	13,528
C6	Public	Citizen Group	Member	3,675
C7	Public	n/a	Resident	8,220
C8	Public	n/a	Journalist	9,478
C9	Public	Citizen Group	Executive Director	4,768
M1	Administrative	City of TO	Open Data	11,700
M2	Administrative	City of TO	Finance	1,150
M3	Administrative	City of TO	Open Data	7,400
M3	Administrative	City of TO	Open Data	7,400
M4	Administrative	City of TO	Finance	10,620
M5	Administrative	City of TO	Finance	14,769
M6	Political	City of TO	Councillor	6,126
M7	Political	City of TO	Councillor	4,760
M8	Political	City of TO	Councillor	8,328
M9	Administrative	City of TO	Information Management	12,348
M10	Administrative	City of TO	Finance	6,307
				188,201