Factors Influencing the Use of Open Government Data: A Scoping Literature Review

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Abstract

Open government data (OGD) describes public data made available online for free use, reuse, and sharing to improve transparency, service delivery, and participatory governance. While OGD has been expected to enhance democratic engagement and economic development, its actual impact has fallen short in terms of value creation. This can be primarily attributed to the still limited use of OGD. Against this background, we conduct a scoping literature review to identify factors that drive or hinder OGD use, thereby differentiating between three use purposes (transparency/accountability, participation, and collaboration) and three types of OGD use (initial use, reuse, and deep use). Our results show that factors influencing OGD use differ considerably across use purposes and types. For example, awareness affects initial use, while high usability drives reuse. Based on our findings, we outline some future research directions on OGD use, which is a necessary requirement for value creation through such data.

Keywords: open government data, use factors, value creation, barriers, scoping review

1. Introduction

Improving service delivery, transparency and participatory government processes is a priority of administrations around the globe (Jurisch et al., 2015; Rasool et al., 2022). Open government data (OGD) has become a cornerstone of these efforts. OGD describes data that are released by governments to the public to be freely used, reused, and shared (Janssen et al., 2012). This is evidenced by key moments, such as former US President Barack Obama's commitment to a more transparent government in 2009 and subsequent implementation and expansion of OGD. An analysis by the European Commission found that the potential monetary value of European public data is immense, estimating a worth of at least 40 billion euros annually, if leveraged properly (European Commission, 2011; Juell-Skielse et al., 2014). These two events catalyzed the global trend, encouraging numerous nations to embark on similar journeys toward transparency and openness (Callinan et al., 2017; Hossain et al., 2016; Jurisch et al., 2015; Scholl & Luna-Reyes, 2011). Furthermore, OGD are seen as a driver for interaction between government and citizens. For instance, citizens may use OGD to comprehend certain government decisions and gain insights into democratic processes. Thus, OGD closes the gap between policymakers and citizens (Jurisch et al., 2015). Potential benefits of OGD adoption are also evident in the literature and encompass positive effects on operational government activities and citizen empowerment alike (Janssen et al., 2012). For those reasons, a steady increase in the availability of government data (Note: In this study "government" refers to all administrative bodies down to local and city level) has taken place over the past decade (F. Wang et al., 2023).

The European Commission predicted that OGD would have high value and utility potential, and the literature has also analyzed the possible benefits of OGD. However, the actual value creation through OGD has not been realized and often falls short of expectations (Janssen et al., 2012; Juell-Skielse et al., 2014; Kawashita et al., 2022; Krismawati & Hidayanto, 2021; Natvig et al., 2021). A key reason for this is the still limited use of OGD, as OGD only creates value when it is used (Janssen et al., 2012; Susha et al., 2015; F. Wang et al., 2023; Warraich et al., 2019).

Numerous studies examine the factors that hinder or drive the use of OGD in general; however, a synthesis of these studies and, in particular, a more nuanced analysis of the factors identified in these studies is still missing. In this regard, a few studies indicate that relevant factors vary across use purposes (Ruijer et al., 2017), as well as use types (Callinan et al., 2017; F. Wang et al., 2023). Against this backdrop, this paper draws on prior research to distinguish between three use purposes (transparency/accountability, participation, collaboration) and three use types (initial use, reuse and deep use) and sets out to conduct a scoping literature review to answer the following research question: What factors drive

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or hinder the use of OGD? In answering this question, we contribute to extant literature by understanding use factors in these categories. Policymakers and practitioners can learn how to adapt and improve the effectiveness of OGD, thereby realizing and maximizing its potential benefits for their specific use purpose.

The remainder of this paper is structured as follows. Section 2 outlines the background of this study. Section 3 describes the method used in this scoping literature review. Section 4 presents the results of the review and in section 5 the results as well as their limitations are discussed, and future research directions are proposed.

2. Background

2.1 Open Government Data (OGD)

The Open Knowledge Foundation defines open data as “data that can be freely used, reused and re-distributed by anyone - at most restricted by the obligation to name sources and “share-alike”. This does not apply to personal data” (OKF, 2012). This definition was cited by multiple authors and extended by Jetzek et al. (2013) to OGD, including government agencies as main supplier: OGD describes data produced or commissioned by governments that are freely available online to use, reuse and share without any limitations like copyright restrictions or monetary barriers (Jetzek et al., 2013). These attributes are the main consensus about what OGD defines in the literature. However, several authors restrict this definition to only include non-personal and non-confidential data (Braunschweig et al., 2012; Halonen, 2012; Janssen et al., 2012), while other authors mandate the attribute of machine-readability for OGD since their purpose is to be reused (Cabitza et al., 2020; Halonen, 2012). Some authors differentiate between open data (provided by any source) and OGD, whereas OGD make up a majority of all available open data and represent the original concept (Cabitza et al., 2020; Jetzek et al., 2013). In this paper, OGD are understood to be data released by governments, that are free to be used, reused, and shared by anyone.

The aim of OGD is to create value for citizens, administrations themselves (e. g. increasing efficiency of internal data management processes) and businesses (Jetzek et al., 2013). To understand the value realization process through OGD use, the value chain model enables the analysis of interactions between activities to identify sources of competitive advantages and an analysis tool to understand where and how value is created. The traditional value chain model by Porter, used to analyze activities in traditional industries, may not be suitable for OGD as the information itself can be a source of value (Attard et al., 2017). Therefore, to fully comprehend the importance of OGD in guiding decision making and enhancing transparency for value generation, the concept of the data value chain was introduced in the literature (Attard et al., 2017; Thakuriah et al., 2017). Potential value lies in driving a chain of innovative information products and services, establishing OGD as a foundation of the information economy (Song et al., 2018). Although, de Reuver et al. (2018) point out, that market activities in the digital economy are less centered around a value chain and rather on generative activities tied to platforms. It follows, that not the provision of OGD and instead its use creates value (Janssen et al., 2012; Susha et al., 2015; F. Wang et al., 2023; Warraich et al., 2019).

2.2 OGD Use

OGD use is a specific form of technology adoption, where established models build the foundation for research. In particular, the Technology Acceptance Model (TAM) (Davis, 1989) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). OGD implementation exhibits substantial variability across different contexts and democratic processes, predominantly within representative democracies (Ruijer et al., 2017). Within these, distinctions in OGD use factors regarding the use purpose can be made among monitorial (transparency/accountability), deliberative (participation), and participatory (collaboration) democratic processes, each utilizing OGD to support democratic functions (Meijer, 2012; Ruijer et al., 2017).

Extant Literature suggests three different use purposes for OGD (Fitriani et al., 2017; Ruijer et al., 2017). Firstly, OGD allows citizens and stakeholders to monitor and verify government initiatives, enhancing transparency and accountability. In a monitorial democracy, as articulated by Keane (2009), the mandate given to elected officials by the electorate is continuously monitored, and the release of OGD helps ensure that these officials are held accountable. The retrospective availability of governmental data provides citizens the opportunity to scrutinize previously opaque processes (Ruijer et al., 2017). Secondly, by making public data accessible, the government can stimulate participation in the democratic decision-making process. Emphasis is put on the importance of participatory dialogue in deliberative democracy, where open debates and inclusive discussions enable citizens to contribute to the decision-making process (Ruijer et al., 2017; Meijer, 2012). And lastly, OGD promotes active citizen collaboration by enabling citizens to find solutions to public issues themselves. Participatory democracy involves citizens' direct engagement and collaboration in addressing public issues. The availability of OGD fosters an environment where citizens are not only informed, but also actively involved in creating solutions (Ruijer et al., 2017).

First indications in the literature show, that OGD use varies across different use types, reflecting a range of different engagement and interaction with the data (Purwanto et al., 2019; F. Wang et al., 2023; Wirtz et al., 2019). In this paper, OGD use is categorized by user engagement levels and use intensity. Firstly, initial use characterizes an individuals' first interaction with OGD, often motivated by specific information needs or driven by curiosity (Jurisch et al., 2015). This initial engagement lays the groundwork for potential further use, depending on the user's experience and perceived value of the data (Fitriani et al., 2017; Jurisch et al., 2015; Souza et al., 2022; Weerakkody et al., 2017). Secondly, reuse refers to users, who engaged with OGD at least once before and return to the same OGD source, which is coined as "use continuance" in IS research (Callinan et al., 2017; Natvig et al., 2021), distinguishing it from the initial acceptance of OGD. This distinction needs to be made, since both the initial use and continued use can be seen as "reuse" for the context of OGD, hence all OGD were used by an administration for a specific purpose before. Thirdly, deep use of OGD was adapted from the description of Hsieh & Wang (2007) for extended use of IS. It involves utilizing OGD to fulfill complex, ongoing informational needs beyond simple queries, and may include promoted usage in structured settings like hackathons or workshops, which aim to foster innovative applications of OGD and therefore exceed the simple reuse aimed only at fulfilling a single information need. Finally, there are some barriers to the use of OGD that result in non-use (Janssen et al., 2012; Smith & Sandberg, 2018). As such, users who lack the sufficient technical skills cannot use OGD (Janssen et al., 2012). Thus, these barriers prevent the different types of use introduced above. They inhibit the initial use and therewith the other use types of OGD.

Prior literature reviews look at OGD value potential in general or focus on a specific perspective, most of which regard the provision of OGD or the institutional (governmental) perspective (Wirtz et al., 2022). This literature review focuses on the user side because understanding the OGD use factors for different use purposes is essential to realizing its value (Safarov et al., 2017). Each use purpose and use type presents unique challenges and opportunities that can inform the design and implementation of OGD policies and provision practices.

3. Method

3.1 Scoping Review

To gain an understanding of the factors driving or hindering the use of OGD, we conducted a scoping review of extant literature. The review was conducted according to methodological guidelines provided by Webster & Watson (2002), Paré et al. (2015), and the PRISMA extension for scoping reviews (Tricco et al., 2018). A scoping review was chosen as the review method for this paper, as it is often used to map key concepts of an area of research, as well as available sources and emerging evidence in the field (Peters et al., 2015).

The aim was to examine a wide range of publications to identify the current understanding of use factors in the context of OGD. Therefore, maintaining a broad scope of research to ensure a comprehensive coverage of the topic, as well as implementing a comprehensive search strategy to gather a wide range of relevant publications is necessary (Paré et al., 2015).

3.2 Literature Search

Adhering to the guidelines for scoping reviews mentioned above (Paré et al., 2015; Tricco et al., 2018), three databases were chosen to conduct the search phase: Scopus, Web of Science and the AIS eLibrary (AISeL), which focus on peer-reviewed literature and ensure a broad and comprehensive coverage in combination.

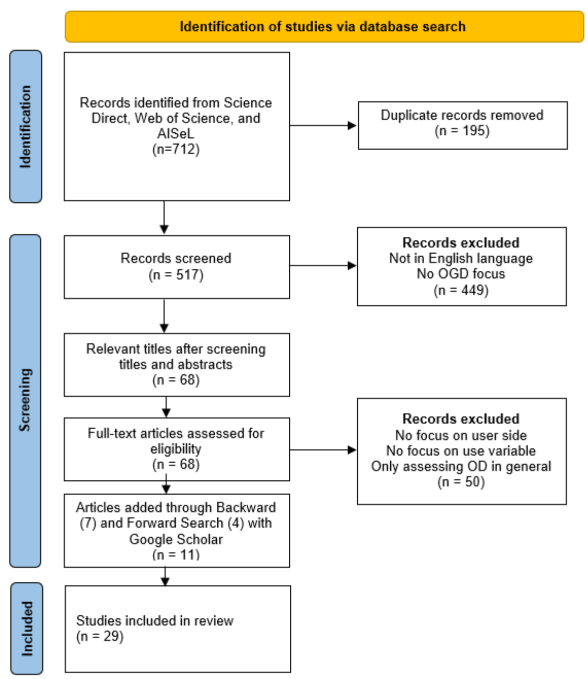

Figure 1. PRISMA flow diagram of study selection process.

To ensure that "the goal of scoping the field (…) as comprehensive as possible" (Paré et al., 2015) is met, Google Scholar was used in the later stages for the backward and forward searches. The literature search process is depicted in Figure 1 and began with a targeted approach, focusing on the Senior Scholars' List of 11

Premier Journals, known for their high-quality publications in the field of information systems, following the recommended approach by Webster & Watson (2002). Relevant keywords were selected to build the search string. The string is separated into two parts. The first part is necessary to narrow the topic to OGD publications, while the second part is concerned with the use, motivations and barriers that are the scope of this paper. The search string used was the following: ("open government data") AND ("motivat*" OR "factor*" OR "use*" OR "barrier*"). The token use* was necessary to include publications that distinguish between user intention to engage with OGD and use intentions (of specific stakeholders). We included peer-reviewed studies if their focus was on the user side and the use of OGD. Studies not available in English or focusing on open data that are not provided by governments were excluded. This query initially yielded only two results that closely matched our research focus. To expand our search and uncover more relevant literature, we continued the search without limiting it to the Senior Scholars' Basket of 11 Premier Journals.

The subsequent stages involved a backward search, examining the references of the papers initially identified to find earlier works cited therein. This yielded seven additions to the final sample. A forward search was also conducted to identify newer publications that cited the initially identified articles, which yielded another four articles. The final literature sample examined includes 29 studies.

3.3 Literature Analysis

The selected literature was scanned for relevant paragraphs that describe use factors of OGD. These paragraphs were then further analyzed to identify recurring themes of these use factors (e. g. transparency: the purpose of identifying information about government activity). For this step the suggested use purposes drawn from extant literature (transparency/accountability, participation and collaboration) were used as foundation for the analysis. The same was done for the classification of factors regarding the use types non-use (barriers to the use), initial use, reuse and deep use.

The analysis of the selected studies has shown that the number of publications in the field has significantly increased since 2019, with 19 of the 29 examined studies conducted since then. This increase can be partly attributed to the rise of the concept of open government and thereby the release of OGD. Quantitative (13) and qualitative (11) research methods were close to evenly distributed in the analyzed studies while four implemented mixed methods. Most quantitative studies used surveys or questionnaires, while the qualitative studies were foremost case studies and drew on interviews. Of the identified use purposes, 13 focused on transparency and accountability, five on participation and nine on collaboration, while one study looked at both participation and collaboration. For the use types, most of the publications focused on initial use of OGD (15), while six focused on reuse and seven on deep use (e. g. through hackathon participation). Barriers were also discussed and identified as the main research focus in six papers.

4. Results

4.1 Barriers hindering OGD Use

Extensive research was undergone in the literature regarding barriers that hinder the use (i.e., lead to non-use) of OGD. Most barriers can be categorized into the broader categories of technical, legal, organizational and user barriers, as summarized in Table 1.

One of the primary technical barriers to OGD utilization is the lack of metadata, which hinders users from fully understanding the context or origin of the data, thus complicating its effective use (Crusoe et al., 2019). Additional technical impediments include a general lack of support for users navigating OGD systems and a deficit in essential information, like metadata and data source, that users need to effectively employ the data in practical applications (Janssen et al., 2012; Kučera, 2017; Smith & Sandberg, 2018; Wieczorkowski, 2019). Janssen et al. (2012) further emphasize the issues with the accuracy, completeness, and currency of the meta information provided. Often, data on specific topics is either completely unavailable, outdated or not valid, rendering it less useful for users who require up-to-date information (Janssen et al., 2012; Kučera, 2017; Smith & Sandberg, 2018; Wieczorkowski, 2019). When data is available, it may be incompatible with data from other sources or even from the same OGD source, since datasets are made available in a multitude of different formats and even the same formats may be structured differently, which complicates its use (Crusoe et al., 2019; Janssen et al., 2012; Shao & Stuti, 2019).

Legal concerns can also discourage users from engaging with OGD. While Janssen et al. (2012) mentioned the potential threat of lawsuits or other legal violations related to data misuse as a barrier to engage with OGD, these legal risks have been partially resolved since (Smith & Sandberg, 2018) and limited to a lack of adequate OGD laws and guidelines (Shao & Stuti, 2019) as well as a multitude of different licenses that are used for different OGD sources.

Organizational barriers include the lack of incentives for users to engage with OGD, as they have to come up with innovative use cases themselves, if the use exceeds fulfilling a simple informational need (Janssen et al., 2012; Smith & Sandberg, 2018). Furthermore, financial constraints hinder the use of OGD as many organizations lack a dedicated budget for utilizing OGD, making it difficult to integrate these resources into regular operations (Kučera, 2017; Shao, Deo Donald, 2019). Additionally, usage fees imposed on accessing certain datasets can deter organizations from adopting OGD as a part of their decision-making tools (Janssen et al., 2012), however usage fees are rarely imposed as they conflict with the concept of OGD.

Table 1. Barriers to the use of OGD.

Context	Barriers (References)
Technical	Poor data accessibility (Crusoe et al., 2019; Janssen et al., 2012; Kučera, 2017; Natvig et al., 2021; Wieczorkowski, 2019)
	Poor data availability (Janssen et al., 2012; Kučera, 2017; Natvig et al., 2021; Smith & Sandberg, 2018; Wieczorkowski, 2019)
	Poor data compatibility (Crusoe et al., 2019; Janssen et al., 2012; Natvig et al., 2021)
Legal	Lack of OGD use standards and guidelines (Natvig et al., 2021; Shao & Stuti, 2019; Smith & Sandberg, 2018)
	Too many different licenses for OGD use (Janssen et al., 2012; Natvig et al., 2021)
Organizational	No incentive for the user (Janssen et al., 2012; Smith & Sandberg, 2018)
	No budget for using OGD within organizations (Kučera, 2017; Shao & Stuti, 2019)
	Usage fees (Janssen et al., 2012)
	Lack of Awareness of OGD Availability (Callinan et al., 2017; Crusoe et al., 2019; Janssen et al., 2012)
	OD suppliers do not or are unable react to user input (Janssen et al., 2012; Natvig et al., 2021)
User	Lack of time (Janssen et al., 2012; Natvig et al., 2021; Smith & Sandberg, 2018)
	Lack of skills (Huang et al., 2017; Janssen et al., 2012; Luna-Reyes, 2018; Ma & Lam, 2019; Smith & Sandberg, 2018; Souza et al., 2022)
	Dissatisfaction with government or no confidence in government (Souza et al., 2022)

Another barrier is the lack of awareness about the availability of OGD; many potential users within organizations are simply unaware that these data resources exist (Callinan et al., 2017; Crusoe et al., 2019; Janssen et al., 2012). Finally, suppliers (pre-dominantly public agencies) are non- or only slowly responsive to user requests, which leads to a lack of data specification and customization options for users, thus further discouraging active use and engagement with OGD (Janssen et al., 2012).

Use barriers identified in the literature can be divided into two types of constraints: user resources and user skills. For resource constraints, Janssen et al. (2012) mentions that potential users often lack the time required to delve into detailed data analysis or to engage with OGD at all. The necessity of registration before data can be downloaded, and unexpected costs that escalate the overall expense of data utilization, can also deter further use (Janssen et al., 2012; Kučera, 2017; Shao & Stuti, 2019). These financial and time-related barriers hinder the broader adoption and effective use of OGD by limiting access primarily to those who can afford and are willing to sacrifice time.

User skills, or rather a lack thereof, is a major barrier to making sense of or utilizing OGD identified in the literature. This includes statistical, technical and data analysis knowledge, which may be necessary – depending on the use purpose - for understanding and using released datasets effectively (Janssen et al., 2012; Kučera, 2017; Smith & Sandberg, 2018). Without the capability to interpret and leverage the data effectively, users are unable to realize the full potential of OGD, leading to underwhelming value realization and minimal impact (Huang et al., 2017; Janssen et al., 2012; Ma & Lam, 2019). If users are generally dissatisfied with government work or have no confidence in an administration, data provided is viewed critically as well, limiting the user engagement to ensuring accountability and transparency provided, rather than engaging with the data and looking for innovative use cases (Souza et al., 2022).

4.2 OGD Use for Transparency/Accountability

To overcome the mentioned barriers, several studies determine a baseline of OGD value in the increase of government transparency. Users are more likely to use OGD and OGD services if they recognize the benefits, such as an increase in said government transparency, and also accountability and efficiency (Fitriani et al., 2017; Wirtz et al., 2019). The results are shown in Table 2. According to Jurisch et al. (2015), higher levels of perceived benefits significantly influence users' intentions to engage with open government services. Hence, government agencies should clearly communicate the potential value for citizens when making their data available to encourage public participation. Other potential benefits, such as economic gains, innovation and improved efficiency, should also be explicitly highlighted to the public to increase their understanding and participation in open government and subsequently, the perceived transparency (Jurisch et al., 2015).

According to Fitriani et al. (2017), users' intention to use OGD websites (in Indonesia) is significantly shaped by the attitude, subjective norms, behavioral control and trust of the users. Users' trust in these websites largely depends on their trust in the government and technology, while their attitude is influenced by the perceived usefulness and ease of use of the website. The results of the study are based on the Technology Acceptance Model (TAM) (Davis, 1989). Their quantitative results show that system quality affects ease of use but not usefulness, while information quality has a positive effect on both. Notably, service quality does not significantly affect these perceptions. Hence, the study highlights the paramount influence of user attitude in determining the likelihood of using OGD websites, suggesting that improving user perceptions of usefulness and ease of use could motivate greater engagement. They conclude similar to (Jurisch et al., 2015), that raising public awareness of the benefits of OGD is crucial. They encourage governments to adopt strategies such as workshops, training sessions and advertising to educate citizens about the benefits of using OGD platforms.

The findings of Souza et al. (2022) show that citizens' attitudes towards open government data in Brazil are influenced by six factors: ease of use, usefulness, intrinsic motivation, political satisfaction, trust in government and intensity of internet use (positively influences initial use intention), following the TAM (Davis, 1989) as well. Ease of use directly increases the perceived usefulness of open government data, which is consistent with findings from (Fitriani et al., 2017) in Indonesia. When citizens find open government data easy to understand and use, they are more likely to recognize its usefulness, recognizing benefits and view the government as more open and accessible. The research also highlights the importance of creating user-friendly and transparent government portals to increase citizen engagement. Despite progress in complying with the Freedom of Information Act of Brazil, challenges remain in meeting citizens' information needs. The study also shows that trust in government, influenced by users' perceptions of privacy and availability of services on websites, plays a crucial role in determining government openness and accessibility. However, the actual use of open government data is still limited by technological challenges, particularly in areas with poor telecommunications infrastructure, which can affect citizens' attitudes towards OGD initiatives. Finally, socio-economic factors such as education, income and region significantly influence attitudes towards open government. The study suggests that intrinsic motivation plays a positive role in increasing public participation in open government activities, but there's a notable digital divide affecting internet access and usage (Souza et al., 2022).

Since transparency can be defined as “giving the public access to government information” (Wirtz et al., 2019), OGD achieves this as a concept by default. However, according to Weerakkody et al. (2017), there is uncertainty among users about the real transparency of OGD. The reason for this is that users have doubts about the extent of corruption in public offices and do not believe in the legitimacy of OGD. This uncertainty highlights a general lack of knowledge and use of OGD and the need for education on its benefits, agreeing with (Fitriani et al., 2017; Jurisch et al., 2015). The study highlights that understanding the usefulness of government-released data, which aims to engage citizens in policymaking and increase government transparency, is crucial to raising user intentions.

Table 2. Factors motivating the use of OGD for transparency and accountability.

Use Factors	References
User Attitude towards Open Government and OGD	(Fitriani et al., 2017; Krismawati & Hidayanto, 2021; Souza et al., 2022)
Awareness of OGD Availability	(Callinan et al., 2017; Cranefield et al., 2014)
Availability of data on a central OGD portal	(Krismawati & Hidayanto, 2021)
Political Interest and expected Transparency	(Albano & Reinhard, 2014; Jurisch et al., 2015; Wirtz et al., 2019)
Recognizing, that governments are more accountable through OGD	(Jurisch et al., 2015; Souza et al., 2022)
Other recognizable benefits of OGD	(Fitriani et al., 2017; Souza et al., 2022; Weerakkody et al., 2017; Wirtz et al., 2019)

The research of Krismawati & Hidayanto (2021) confirms that the perceived usefulness of OGD has a significant impact on user behavior, consistent with previous studies across different technologies (implementing the TAM). Positive perceptions of the usefulness of public sector data are common, suggesting that citizens are more likely to actively engage with data if they recognize its usefulness. However, the challenge remains in the format of the data released, which often requires technical skills to interpret and use effectively, potentially limiting wider use by the public. In addition, the study highlights the importance of usability and social acceptance in the adoption of OGD. Data that is easy to use can significantly influence user behavior and perceptions of its usefulness. Social approval within a user's community can reinforce positive intentions to use OGD, as evidenced by the bandwagon effect (Rosenkopf & Abrahamson, 1999), where early adopters influence the perceptions and adoption behavior of others. This highlights the role of social interactions and community influence in promoting the adoption of OGD.

4.3 OGD Use for Participation

Beyond the increases in Transparency and Accountability through the release of OGD, participation describes the opportunity to take part in the democratic decision-making process by knowing what is going on and influencing what is going on (Ruijer et al., 2017). The availability of OGD predominantly enables the first part. Table 3 lists the factors driving the motivation to use OGD for the purpose of participation as extracted from the literature.

Table 3. Factors motivating the use of OGD for participation.

Use Factors	References
Opportunity to give feedback on policies	(Jurisch et al., 2015)
Making government more efficient	(Jurisch et al., 2015)
Creating/ Using new types of government service delivery	(Jurisch et al., 2015; Weerakkody et al., 2017)
Perceived Ease of Use	(Fitriani et al., 2017; Jurisch et al., 2015; Weerakkody et al., 2017; Wirtz et al., 2019)
Perceived Usefulness	(Fitriani et al., 2017; Jiang et al., 2021; Jurisch et al., 2015; Souza et al., 2022; Weerakkody et al., 2017; Wirtz et al., 2019)
Accessibility	(Purwanto et al., 2019; Rasool et al., 2022; Zuiderwijk et al., 2015, 2015)
Technical Skills/ Computer Skills	(Purwanto et al., 2019; Rasool et al., 2022; Smith & Sandberg, 2018; Weerakkody et al., 2017)
Promotion of Democratic Values	(Kassen, 2021; Weerakkody et al., 2017)

The usability of open government platforms has a positive impact on adoption intentions. Platforms that are intuitive with well-organized information, encourage user engagement (Fitriani et al., 2017; Jiang et al., 2021; Krismawati & Hidayanto, 2021; Wirtz et al., 2019). The geographical relevance of the topics discussed also has a significant impact on user engagement; users are more likely to participate in discussions about local issues than about broader state or national issues (Jurisch et al., 2015; Kassen, 2021). Initially, targeting politically active users can help build momentum for open government initiatives, as these users are more likely to engage with and benefit from such services (Kassen, 2021).

The study conducted by Wirtz et al. (2019) shows that citizens' intention to use open government data and subsequently engage in word of mouth (WOM) communication about it is determined by five key factors: ease of use, perceived usefulness, and expectations of transparency, participation and collaboration. Wirtz et al. (2019) don’t report a difference between the use purpose of OGD, these use factors are shared between transparency, participation and collaboration. The research emphasizes that none of these factors individually dominate the others and it highlights the balanced influence each has on user intention. However, perceived usefulness emerges as the strongest determinant of the five, supporting rational choice theory that people are motivated by the benefits they can derive from OGD, which in the context of OGD translates into improved transparency and civic engagement (participation). Further findings suggest that ease of use and citizens' expectations of government's ability to increase transparency, encourage participation and foster collaboration significantly influence their willingness to use OGD.

These findings are in line with (Zuiderwijk et al., 2015),which underline the aim of open government to create public value. The study also shows that while expectations of transparency and participation are close in influence, the impact of collaboration is somewhat weaker. This suggests some nuances in how these concepts are perceived and valued by citizens. In addition, the study shows that the intention to use OGD strongly influences citizens' WOM intentions, suggesting that positive experiences with OGD lead to advocacy among peers. This highlights the importance of social media platforms as effective tools for both disseminating OGD and facilitating WOM intention. Public managers are advised to ensure that their platforms are accessible and tailored to different social groups in order to maximize engagement and harness the potential of social media to raise awareness and interact directly with citizens. This approach not only enhances the effectiveness of OGD, but also promotes equity in public service delivery, ultimately supporting democratic values and efficiency in governance. To conclude, the findings of Wirtz et al. (2019) confirm the results of Souza et al. (2022) and Jurisch et al. (2015), that perceived usefulness is a major factor for the intention to use OGD and suggesting the promotion of benefits of OGD.

4.4 OGD Use Motivations for Collaboration

Multiple studies observe the motivations and reasons of individuals to participate in OGD innovation contests (Juell-Skielse et al., 2014; H.-J. Wang, 2020; Zhang et al., 2023). Even though this OGD use type is directly facilitated by OGD suppliers, it is a form of deep use of OGD that aims to create value for participants or fellow citizens. Therefore, the motivations to participate are structured within the use purpose of collaboration and shown in Table 4.

The first factor that influence the participation in OGD innovation contests is the awareness of such collaboration opportunities (Callinan et al., 2017). Furthermore, Juell-Skielse et al (2014) find that the primary motivation for individuals to participate in an innovation competition is intrinsic, with fun and enjoyment, intellectual challenge, and status and reputation ranking highest. Although user need also ranked highly, which is an extrinsic motivation, other extrinsic factors such as monetary incentives, reciprocity, signaling, and career concerns were less motivating. The notions of professional and personal identity refer to intrinsic motivation, where participants want to be seen as competent developers. Reciprocity involves participants expecting recognition or reciprocity in return for their contributions, while signaling and career concerns involve using the contest as a platform to showcase their skills to potential employers or customers. Similar motivations are observed among developers participating in open-source communities, where fun, intellectual stimulation and status are important factors.

Table 4. Factors motivating the use of OGD for collaboration.

Use Factors	References
Awareness of collaboration/ co-creation opportunities	(Callinan et al., 2017)
Intrinsic Motivations (e. g. Fun/Enjoyment, Intellectual Challenge)	(Callinan et al., 2017; Juell-Skielse et al., 2014; Purwanto et al., 2019; Zhang et al., 2023)
Extrinsic Motivations (Learning, Developing Skills, Networking)	(Juell-Skielse et al., 2014; Purwanto et al., 2019; H.-J. Wang, 2020)
Social Influence	(Purwanto et al., 2019; H.-J. Wang, 2020)

The study by H.-J. Wang (2020) issued questionnaires to participants of a Taiwanese OGD contest and identifies two primary factors influencing the adoption of open government data among individual user innovators through quantitative analysis of the results: computer self-efficacy and social influence. Specifically, social influence is highlighted as having a predominant impact on adoption (positively influences initial use), echoing patterns observed in various technology adoption settings, including social networks, mobile government, and e-commerce systems, among others. Purwanto et al., (2019) confirm these findings, as their results show social influence and fun and enjoyment as the two main factors that influence the participation in OGD hackathons. These findings reinforce the relevance of social cognitive theory in explaining the behavior of user innovators in adopting open government data. In addition, the study highlights the positive impact of computer self-efficacy on open government data adoption, which is consistent with previous innovation literature that identifies self-efficacy as a key driver of technology adoption behavior (Davis, 1989). The study extends the applicability of computer self-efficacy from areas such as healthcare systems and computer technologies to open government data. In their findings, neither tool experience nor government support were significant determinants of open government data adoption. The lack of significance of tool experience could be attributed to the diverse backgrounds of the respondents, suggesting that a background in information technology alone does not necessarily influence decisions to adopt open government data. Similarly, the expected impact of government support was not observed, possibly because many of the user innovators were unaware of the government's OGD initiatives, which were still relatively new, when the study was conducted. This suggests that greater awareness and maturity of these initiatives may be required to observe their potential impact on adoption behavior.

Zhang et al. (2023) conducted a questionnaire with participants of an OGD innovation contest in Shanghai and concluded that monetary incentives, which are typically important motivators in general crowdsourcing contests, do not play as central a role in OGD contests. Instead, these contests benefit from focusing on increasing participants' sense of competence and belonging. To foster this environment, it's beneficial to create a community that allows for easy communication between participants. In addition, designing contest tasks that provide a degree of autonomy and emphasize hedonic affordances, such as enjoyment and social connection, can significantly increase participation. Participants often value the opportunity to connect with others who share similar interests and feel a boost of confidence in their ability to complete the challenges presented. The findings align with the results of Juell-Skielse et al. (2014) and H.-J. Wang (2020), as discussed before.

5. Discussion and Conclusion

The aim of this study was to analyze the factors influencing the use of OGD identified in prior literature. The key findings are as follows: first, OGD use factors vary across different use purposes. Our results yielded three different use purposes that were identified in the extant literature: transparency/accountability, participation and collaboration. For transparency, political interests and data availability on a central access point were important factors that drive the use of OGD. As for participation, the perceived usefulness and ease of use, as well as technical skills and the promotion of socio-democratic values drive the engagement with OGD. When engaging with OGD for the purpose of collaboration, the awareness of collaboration opportunities and intrinsic motivations, such as fun and enjoyment are the most reported factors, while extrinsic motivations and social influences are also reported.

Second, our analysis reveals that OGD use factors vary across the identified use types (initial use, reuse and deep use). The factors driving OGD use differ based on these three types with an increasing frequency and intensity of use. While initial use is mainly determined by the awareness of available OGD, reuse and deep use are determined by the usability, and ease of use of OGD portals, as well as the intrinsic motivations of users.

Third, extant literature focuses primarily on the initial use of OGD (15 studies), as well as the use purpose of transparency (13 studies). This is in line with the primary goal of creating more transparent and open governments by providing OGD. Initial use represents the requirement for further reuse and potentially a higher intensity (deep use) later.

Lastly, the extant literature does not discuss different user types but only mentions generic stakeholders in the studies (e. g. users, citizens). However, use factors will likely differ between private users and businesses or between different groups of citizens. These findings enhance the current body of knowledge by showcasing the different factors that lead to the use of OGD, while prior literature reviews focus on the provision, conditions and impact of OGD use (Safarov et al., 2017). Practitioners can benefit from these findings by adapting the provision of OGD to target a specific form of OGD use type or purpose, potentially enhancing the overall use.

In conducting this scoping review, several limitations must be acknowledged, providing additional directions for future work. First, the variability in research methodologies and data collection approaches, such as the use of both qualitative and quantitative methods, may have introduced heterogeneity that complicates direct comparisons across studies. Second, conclusions based on the interactions of the identified factors cannot be drawn based on this review. However, exploring these interactions is a promising topic for future research, e.g. via a qualitative comparative analysis.

Future research could generate interesting results when integrating factors facilitating OGD use on the user and supplier (government) sides. Furthermore, different user types were not discussed in the literature, which points to two potential research areas. One focuses on whether different user types have different motivations to engage with OGD, while a subsequent study may look into whether the factors driving specific use purposes and use types of OGD are specific for the types of OGD users discovered.

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