

# Drivers of Dissatisfaction with an Open Government Data Portal: A Critical Incident Technique Approach

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**Abstract.** Open government data (OGD) has emerged as a crucial aspect of digital transformation strategies, prompting many governments to establish national OGD portals to facilitate access to large amounts of public sector datasets. However, despite the OGD portals' goal of serving as intermediaries between OGD producers and OGD users, they have faced numerous criticisms for their low use and failure to adequately meet users' needs. The lack of consensus within the OGD community on the sources of dissatisfaction with the OGD portals and their negative impact on their use warrants a detailed examination of users' dissatisfying experiences. Taking a user-centred perspective, I adopt a critical incident technique (CIT) approach to identify the drivers and sources of dissatisfaction with a national OGD portal. Based on my analysis, a descriptive model is proposed to help to comprehend the interrelations between three sources of dissatisfaction with the OGD portal and ten respective drivers: OGD production (i.e., development of high-quality datasets, completeness of the metadata), OGD distribution (i.e., accessibility of the datasets, organisation of the datasets, centralisation of the datasets, search engine, interface, visualisation), and OGD use (i.e., skills and knowledge, and added value).

**Keywords:** Open Government Data, Dissatisfaction, CIT.

## 1 Introduction

Over the past years, governments have been keen data producers [1]. While government-produced data were initially made accessible through statistical reports or after long and official request processes [2], the emergence of policy debates demanding more transparency gave rise to Open Government Data (OGD). OGD are data produced by state bodies made freely accessible, modifiable, sharable, and usable by anyone with minimal control mechanisms like copyright, price, or repurposing restrictions [3]. As a strong hypothesis in the OGD community is that the value from OGD can best be generated when datasets are being used, previous research pointed out that opening datasets needs to be accompanied by OGD portals to facilitate the distribution of datasets [2, 4-6]. Typically implemented as web-based catalogue systems, OGD portals allow producers to upload their datasets while affording users to download the datasets judged to be useful through the portal's search engine or directly via Application Programming Interfaces (API) [4, 6]. Altogether, the OGD portals aim to afford further use by playing the intermediary role between the OGD producers (i.e., public administrations or organisations with a state mandate) and the OGD users (by definition, anyone with interest in the datasets) [2]. These OGD portals received many criticisms fuelled by the fact that datasets are being shared on OGD portals, assuming that they are meant to be further used while their use remains low in practice [7-10].

It is necessary to investigate users' needs to address the low use of OGD portals. Previous research has shown that any information system (IS) not meeting users' needs may not be used [11]. It is thus time to investigate the users' needs [12, 13] especially given that users have reported that OGD portals do not cater to their needs [14]. Given that OGD users can be anyone interested in the datasets, there is a great diversity of user types with respective capacities and interests [15, 16]. However, like for any IS, it can be assumed that there are power and minimalist users. Power users operate the OGD portal with accomplished experience and knowledge, enabling the use of advanced features of the OGD portal. In contrast, minimalist users lack some experience and knowledge to use all the portal's features. Since most users fall into the minimalist category operating the OGD portal with less experience and knowledge [14], investigating their needs enables to identify the lowest common minimum standards of all users' needs. Minimalist users are comprehended as users who are aware of the OGD portal and perceive its usefulness but experience issues when using the OGD portal. As with any IS, when users perceive the IS' usefulness, their overall satisfaction with the IS will make them return [17]. Accordingly, user satisfaction is understood as a successful interaction between the OGD portal and its users, whilst dissatisfaction occurs when the OGD portal does not meet users' needs.

Due to the lack of consensus within the OGD community on the sources of dissatisfaction with the OGD portal and the consequent negative impact on its use, my research seeks to identify the drivers that generate users' dissatisfaction with the OGD portal. Identifying the drivers of dissatisfaction with the OGD portal is needed because the pressure on governments has augmented, given, on the one side, the high investments made by governments and, on the other side, the fact that OGD use remains low in practice [13]. Hence, to ensure minimal use of the OGD portal, researchers and

policymakers need to identify the drivers of users' dissatisfaction with the OGD portal. Based on the findings, concrete actions can be taken to improve users' experiences and achieve the desired outcomes of the OGD portal, thereby alleviating the existing political pressure associated with low OGD use. To accomplish this, I adopt a critical incident technique (CIT) approach to identify drivers of dissatisfaction with the OGD portal. Thus, my study's research question is: What are the drivers of dissatisfaction with the OGD portal? Since my approach intends to conduct an in-depth analysis of a national OGD portal, the best outcomes could be achieved by covering the portal to which the author belongs. Therefore, this paper focuses on the national OGD portal of Switzerland. My study is structured as follows: I first outline the background of the paper, then present the research methodology before exposing the results leading to the discussion and conclusion.

## **2 Background**

### **2.1 Expectation Disconfirmation Theory**

Previous research demonstrated the importance of understanding and managing expectations in various contexts through the Expectation Disconfirmation Theory (EDT). Not surprisingly, EDT has also been applied to study IS adoption, use, and satisfaction [18-21]. EDT is often used to explain the level of satisfaction based on users' expectations. According to EDT, outperforming expectations is seen as positive disconfirmation leading to satisfaction [22]. On the other hand, falling short of expectations is seen as a negative disconfirmation leading to dissatisfaction [22]. Disconfirmation is thus a subjective comparison resulting from thinking that performance was better (i.e., positive disconfirmation) or worse (i.e., negative disconfirmation) than expected [22, 23]. While expectations are one's pre-use beliefs about how the IS will perform based on its features, performance is one's post-use beliefs about how the IS performs [23]. EDT posits that users typically compare their perceived performance with their expectations leading to positive or negative disconfirmation affecting satisfaction or dissatisfaction [24]. In the context of my paper, if the OGD portal surpasses expectations, users are likely to be satisfied with the OGD portal (i.e., positive disconfirmation). Conversely, if the OGD portal falls below expectations, it will be perceived as negative disconfirmation by users, leading to dissatisfaction.

### **2.2 About Users' Dissatisfaction**

Understanding users' needs is a critical aspect of developing successful systems. For that purpose, prior research has studied user adoption and intentions to use OGD [5, 25, 26]. However, simply adopting and intending to use OGD is not enough, as a common assumption regarding OGD use is that opening government data is meaningful only so far as they are used [27]. Minimal use of the OGD portal is thus required to ensure that OGD are used, not just published [2, 5]. Accordingly, the OGD portal cannot be considered successful if not used by its users [28]. Combining this with EDT means that if

the system performs better than expected, it leads to users' satisfaction and reinforces the users' attitude towards the system. If the system performs worse than expected, it produces adverse effects and complaints, bringing its share of dissatisfaction. In sum, if there have been satisfying past experiences with OGD, users are more likely to interact again with the OGD portal [2, 29], while dissatisfied users tend to stop using it [28].

Studying users' dissatisfaction with the OGD portal is needed to improve users' experience. Studying users' dissatisfaction is all the more relevant given that users' experience is a function of what users remember, and users are better at remembering bad experiences in the government context [30]. One negative incident – such as a poor-quality dataset downloaded from the OGD portal, the search engine, which does not find the desired datasets or the help functionalities not addressing the asked questions – can bring its share of dissatisfaction and discredit the users' overall impression of the OGD portal. By studying users' dissatisfaction with the OGD portal, the aim is to make negative incidents with the OGD portal as rare as possible, especially because negative incidents, in the government context, affect average user (dis)satisfaction four times more than positive incidents [30]. Accordingly, identifying where and when such dissatisfying experiences occur enables targeted interventions to make these negative incidents as rare as possible. Hence, knowing what drivers make users dissatisfied creates opportunities for improving the OGD portal to avoid or limit the recurrence of such negative incidents. To do so, I focus on user experience using the critical incident technique (CIT) because users can only develop dissatisfaction after having hands-on experience with the OGD portal.

### 3 Critical Incident Technique

I used the CIT to address my research question. Introduced in the social sciences by Flanagan [31], the CIT is a well-established qualitative research tool which consists of “a set of procedures for collecting direct observations of human behaviour” [31]. The choice of the CIT was motivated by three of its features. Firstly, it provides a relatively fast diagnosis of the problematic aspects of users' needs. Secondly, I believe it is the suitable method to identify the drivers of dissatisfaction with the OGD portal because the technique emphasises incidents (i.e., things which happened and were directly observed) that are critical (i.e., things which significantly affected the outcome). Thirdly, CIT brings valuable practical implications [32].

CIT relies on a set of procedures for collecting observations of human behaviour, analysing, and classifying them to be useful in addressing practical problems [33]. By retrieving critical incidents, CIT requires answers based neither on intuitions nor opinions but on facts, which allows for turning factual anecdotes into data [34]. As the data are collected from the respondents' perspective, CIT allows respondents a free range of responses as they can use their terms and languages to recall their experiences [33]. By being sufficiently complete, the critical incident leaves little doubt concerning its effects, allowing inferences and predictions to be made [31]. In that sense, an incident is deemed critical when it contributes to or detracts from the general aim of the activity in a significant way [32, 33]. Applied to my study, I understand by critical incident any

story containing a clear and detailed example of a user's experience while using the OGD portal. I focus on the negative critical incident, which is any dissatisfying experience with the OGD portal, that is, all users' encounters with the OGD portal, resulting in frustration and dissatisfaction.

### 3.1 Data Collection

To investigate the drivers of dissatisfaction with the OGD portal, I employed CIT to collect critical incidents from users of the national OGD portal of Switzerland. This national OGD portal serves as a typical case for other countries due to its adherence to the Comprehensive Knowledge Archive Network (CKAN) [35], which is recognised as the international and de-facto standard for OGD portals [2]. Although minor variations may exist in the front-end implementation of the portals, the CKAN standard ensures a high level of technical interoperability across portals by establishing metadata standards and tools to facilitate the interaction between the portals and their users [2].

To collect my data, I employed the focus-group interview technique due to its ability to reduce the cost in time and personnel while retaining the advantages of individual interviews, such as the interviewer's ability to establish contact, provide explanations, and answer questions [31]. The effectiveness of this technique has been excellent [31]. My sample consisted of 23 public managers from diverse branches (and levels) of the Swiss government, including IT, Education and Research, Health, Finances, Foreign Affairs, and Information Services. Since most users of OGD fall into the minimalist category operating the OGD portal with less experience and knowledge [14], this study aims to investigate their needs. Thus, I followed a purposive sampling strategy to recruit participants following a certificate of advanced studies in Digital Government, a certified on-the-job training program for managers in public organisations from federal, cantonal, and communal levels responsible for or engaged in public digitalisation projects. In consideration of the participants' engagement in public digitalisation projects, participants displayed a level of awareness regarding the OGD portal and acknowledged its usefulness. However, they lacked some experience and knowledge to use all the portal's features, leading to issues when using the OGD portal.

I conducted three focus-group interviews in November 2021, all structured around open-ended questions that encouraged participants to brainstorm and describe their dissatisfying experiences when using the OGD portal. The open-ended questions were designed to focus on the specific features of the OGD portal and the characteristics of the datasets, considering participants' resources and capabilities during their interactions with the OGD portal. Each participant was free to share dissatisfying experiences spontaneously when using the OGD portal, which allowed other participants to bounce back by commenting on the shared experiences, adding new elements, or developing other experiences. The interviewer played the role of facilitator, encouraging the discussion to generate data based on participants' interactions. It was fluent for the interviewer to manage the existing relationships and create an environment where participants were relaxed and encouraged to exchange their experiences. Indeed, participants were well informed about the purpose of the study, knew each other from following the same certificate of advanced studies, and previously agreed to engage in the discussions fully.

Participants were asked to provide specific details of their dissatisfying experiences and explain why each experience was particularly dissatisfying. Before starting the focus-group interviews, participants provided informed consent to be recorded. The focus-group interviews lasted approximately one hour and concluded when participants could not report additional incidents. I transcribed the interviews verbatim using the recordings.

### **3.2 Data Analysis**

To analyse the data collected from the focus-group interviews, I used content analysis, a systematic approach to identify and categorise patterns and themes in the data [36]. I used an inductive approach to analyse the data and identify critical incidents that were used as the primary unit of analysis. Only incidents that occurred while users were using the OGD portal contained a clear example of dissatisfying experience and were described in sufficient detail for research analysis were considered. A total of 140 incidents were identified, which I grouped into drivers of dissatisfaction based on similarities in the reported experiences using an analytical induction process [32, 37]. Following the initial content analysis of the critical incidents identified, I elaborated ten drivers of dissatisfaction by grouping the critical incidents according to their meanings. The drivers and their names were not preconceived but flowed from the data [37]. Moreover, to get a higher level of abstraction, I repeated the process and regrouped the ten drivers into three sources of dissatisfaction by identifying where and when the drivers and their respective incidents occurred. This higher level of abstraction enables the identification of the responsible stakeholders and the development of targeted interventions.

Regarding sizes, most studies examined 50 to 100 incidents [38]. My 140 critical incidents provide sufficient theoretical saturation, especially as the last group interviewed did not report any critical incident that required the development of a new driver. My approach captured the essential sources of dissatisfaction while retaining the granularity through the drivers and specific details through the identified incidents.

## **4 Results**

The drivers and sources become essential for understanding dissatisfaction with the OGD portal. The higher level of abstraction allows to identify where and when such dissatisfying experiences occurred and the responsible stakeholders. I present my results through the drivers and sources of dissatisfaction, not by detailing each identified critical incident. However, statements from the critical incidents are cited for illustrative purposes. The results indicate that dissatisfaction with the OGD portal arises from three sources: OGD production, OGD distribution, and OGD use. Hence, dissatisfying experiences with the OGD portal are not limited to issues exclusively related to the OGD portal but also encompass negative incidents related to OGD production and OGD use. From Figure 1, one can see that when analysing dissatisfaction with the OGD portal, from the 140 critical incidents identified during the focus-group interviews, the

most prominent source is OGD distribution (83 incidents), followed by OGD use (29 incidents), and finally, OGD production (28 incidents). Research on critical incidents suggests that what is important is how many times incidents occurred [39]. Given that the frequency of critical incidents is relevant in CIT because it is their frequency which stands these incidents out [40], Figure 1 relates the number of critical incidents per driver and source. The results show how users fall short of expectations and how dissatisfying experiences and drivers of dissatisfaction lead to negative disconfirmation and dissatisfaction.

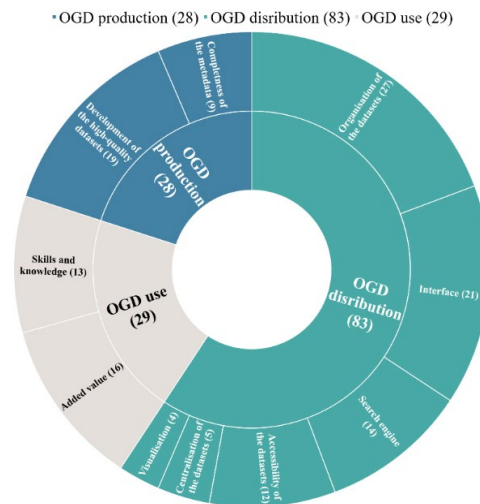


Fig.1. Drivers and sources of dissatisfaction with the OGD portal

#### 4.1 OGD production

Before being published on the OGD portal, datasets are generated by OGD producers (e.g., public administrations and organisations with a state mandate...). The first source of dissatisfaction stems from OGD production, as it determines if the datasets may (or not) be exploited to their full potential. My results demonstrate that OGD production can lead to dissatisfaction with the OGD portal if the datasets provided do not align with users' expectations. This first source of dissatisfaction with the OGD portal does not pertain to the information produced by the OGD portal itself but is instead the result of the work of OGD producers. This means that the work performed by OGD producers directly affects users' dissatisfaction with the OGD portal. In summary, users' expectations regarding OGD production can result in disconfirmation with the produced OGD, ultimately leading to dissatisfaction with the OGD portal. Two drivers of dissatisfaction related to OGD production are the development of high-quality datasets and the completeness of the metadata.

The first driver contains 19 incidents, including incomplete or outdated datasets, dead links, or empty tables. The lack of high-quality datasets' development impedes the use of the OGD portal, given that users cannot take the best advantage of the datasets, which leads to frustration and dissatisfaction. This is especially true given that the users have a snapshot of several datasets, which inspires ideas for use but is directly

hindered by poor data quality. An illustrative example of such incidents is mentioned below:

*“Typically, some data could be used for marketing purposes to do customer targeting, but the problem is that I don’t have a guarantee of having the latest data. I wouldn’t have been able to use the found dataset for marketing purposes as it was from 2016 to 2018 and then stopped. [...] I cannot set up a customer targeting with a dataset outdated by three years.”*

The second driver, containing nine incidents, pertains to the absence of contextual information or incomplete datasets descriptions that are essential for datasets’ subsequent use. The fact that the metadata is incomplete produces a feeling of dissatisfaction, as illustrated below:

*“And even the datasets, when you find them, you think “Ah great, this one looks interesting”. But when you export the dataset, you don’t have the information on the metadata. I opened one dataset about private use of the internet and internet security. There are some concepts which are not explained. So, when they mention fishing, you think, well, fishing from the person? Fishing from his email? Has the person experienced this? I couldn’t find out if it were actual experiences or something else... So, in the end, you can’t use that data, at least from my experience.”*

## 4.2 OGD distribution

By cataloguing the datasets from OGD producers, the OGD portal facilitates users’ access to OGD. Acting as a comprehensive “one-stop-shop”, the OGD portal enables users to search and retrieve the desired datasets. Consequently, both the OGD portal and individual perceptions of its performance impact the extent to which the OGD portal can deliver expected benefits. Specifically, the design of the OGD portal interface plays a crucial role in shaping users’ expectations. Individuals tend to rely on previous experiences as reference points and expect uniformity in the design and functionality of online interfaces. During the focus-group interviews, for instance, numerous participants drew on analogies with Google search and compared the OGD portal’s search engine to the one of Google. This comparison illustrates the discrepancy and misalignment between the users’ expectations and what is provided through the OGD portal. As a result, when users’ expectations are not aligned with the features offered by the OGD portal, disconfirmation with its features occurs, leading to dissatisfaction. Six drivers related to OGD distribution were identified as drivers of dissatisfaction with the OGD portal. These drivers include the accessibility, organisation, and centralisation of the datasets as well as features of the portal itself, such as interface design, poor search capabilities, or inadequate visualisation tools.

The first driver is the accessibility of the datasets, which contains 12 incidents. The challenges associated with accessing datasets raise fundamental questions about the portal’s purpose, as illustrated below:

*“The portal doesn’t make data access much easier; it puts data in one place but doesn’t make accessibility much easier [...]. If I entered the keywords I put on the portal directly into Google, I could reach the data source almost as fast.”*



The second driver, concerning the organisation of the datasets, includes 27 incidents and relates to issues such as the lack of standardisation, aggregation, and hierarchy of the datasets. In addition, users also expressed dissatisfaction with the absence of a minimal data model, which contributed to their frustration. This sentiment is exemplified in the following statements:

*“I have the impression that they did their thing, they said to themselves that’s good and then pushed all the information they had, and then if there are cantons that are over-represented and others that don’t play the game, that’s fine. [...] Okay, we have a lot of stuff... But at the end, it’s like when I tell my son to clean up his room, and he puts everything under the bed... The categories are poorly organised. I have the impression they gave a mandate to an intern over the summer.”*

The third driver pertains to the centralisation of the datasets and includes five incidents. While most incidents are prone to dissatisfaction, incidents relating to the centralisation of the datasets are more nuanced. The nuance arises from the fact that while users acknowledge the advantage of centralising datasets, they are not entirely convinced of how this has been accomplished, as illustrated in the following statement:

*“[The portal] main use is to search only in one place... Yeah, it’s not bad; it’s a kind of reference. [...]”*

The fourth driver includes 21 incidents and pertains to the interface design of the OGD portal, particularly concerning the lack of state endorsement, ease of use, and language disparities. While some aspects of the interface design are mentioned positively, users expressed dissatisfaction with practical aspects that hinder their use of OGD, as exemplified in the following statement:

*“In terms of features, there are a lot of things; there are nice logos, lots of inputs etc... But in the end, it’s a bit like having an aeroplane cockpit full of buttons and possibilities, but the cockpit is put on the handlebars of a bicycle.”*

*“I always come across pages that are not in my language. The page, including the text of the law, is in English. It’s not even a national language! And, indeed, the portal is not translated into the national languages, at least not all of them.”*

The fifth driver contains 14 incidents and pertains to the lack of performance of the search engine and the fact that one needs to be very precise to find relevant datasets, leading to frustration. The poor search engine capabilities lead to frustration and dissatisfaction, as illustrated in the following statements:

*“As soon as you know exactly what you are looking for, that’s when it’s over. If you don’t know, you explore the portal, and it’s okay.”*

*“I found that it only reasoned at one level, so I don’t know if the keywords will also search in the database or if it will only search in the description, in the title or whatever. But as a result, I looked, for example, for things related to mobility, and there were relatively few documents that came up, whereas when you go to the mobility section, there are many things that come up.”*

The sixth driver pertains to the lack of visualisation options and includes four incidents. According to participants’ statements, having more visualisation options would facilitate the use and exploitation of datasets as visualisations are seen as means of

supporting the use by inspiring possibilities. The following illustration provides an overview:

*“The problem is that the portal also lacks a minimum of visualisation... Let’s imagine that the description doesn’t provide everything needed for a complete visualisation... We should at least have a minimum of visualisation for some data so that we can tell ourselves: I’m interested in this data because it can be cool to be used as shown. So, at least have an overview of some visualisations’ possibilities.”*

### 4.3 OGD use

The third source of dissatisfaction relates to OGD use, which relies on the users and is subject to their capacities. Two drivers of dissatisfaction related to OGD use pertain to the lack of skills and knowledge and the perceived lack of added value. Unaligned expectations related to OGD use can lead to disconfirmation of the OGD use and dissatisfaction with the OGD portal. The critical incidents retrieved indicate that dissatisfaction can arise when users find themselves limited in using the OGD portal, either due to their lack of skills and knowledge or the lack of tutorial and help functionalities available on the OGD portal. However, the 13 incidents identified have been grouped into skills and knowledge, as the quality of support users need depends on their capabilities. An example is illustrated through the following statement:

*“I came across something; now I don’t remember exactly what it’s called, a kind of format or whatever, that I should have had a program to read [...] I had a pop-up message saying I had to transform the data but couldn’t. I couldn’t process the datasets in the format I got.”*

The last driver pertains to the perceived lack of added value of the OGD portal. This driver comprises 16 incidents where users expressed dissatisfaction due to the portal’s incapacity to provide good automation and additional guarantees on datasets’ quality. This driver highlights how users’ dissatisfaction stems from their perceptions that the OGD portal does not offer enough added value compared to alternative data sources. This sentiment is encapsulated in the following statement provided by a user during the focus-group interviews:

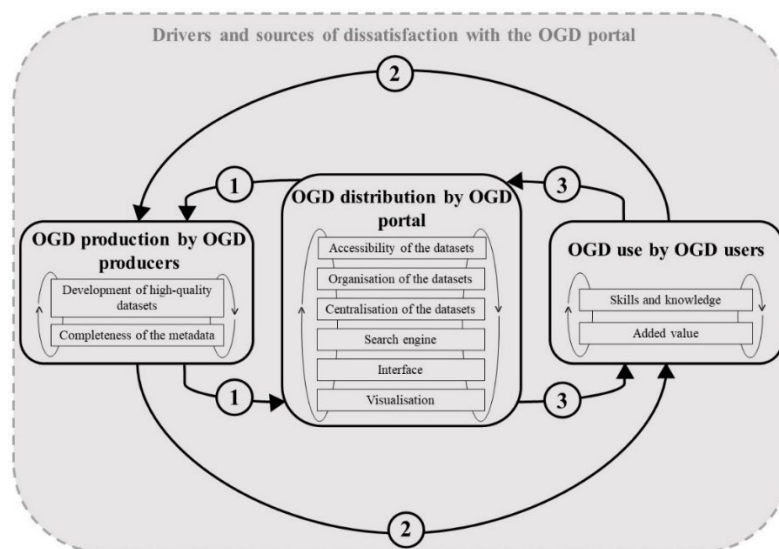
*“The portal is a data graveyard, but we don’t do anything with the datasets... Whereas if there was an added value... but there is no added value, it’s a data graveyard.”*

## 5 Discussion

In this discussion section, I synthesise the results into a descriptive model of the drivers and sources of dissatisfaction with the OGD portal, as depicted in Figure 2. By outlining the interrelations between the sources and respective drivers, the descriptive model provides a framework which helps to comprehend the interrelations between the sources of dissatisfaction with the OGD portal. By showing that the drivers and sources are interrelated and can have a cascading effect on one another, the model also illustrates the necessity to address them as part of a holistic approach. Although my descriptive

model also shows the interrelations between the drivers within each source of dissatisfaction, I do not expound on the interrelations as they are inherent to their common source. My focus is thus on the interrelations across the sources and their respective drivers.

By rereading the critical incidents identified, the following interrelations between the sources and their respective drivers could be recognised: 1) Interrelations between OGD production and OGD distribution; 2) Interrelations between OGD production and OGD use; 3) Interrelations between OGD distribution and OGD use.



**Fig. 2.** Descriptive model of drivers and sources of dissatisfaction

The descriptive model aids in understanding the process of how dissatisfaction with the OGD portal develops and which stakeholders could be held accountable. The model can help OGD stakeholders become aware of their role in the dissatisfaction with the OGD portal, including how each driver interrelates with one another. The model shows that to avoid dissatisfying experiences with the OGD portal, a holistic approach is needed, implying concrete actions from OGD producers, the OGD portal, and OGD users. The descriptive model is developed as a recursive loop that keeps repeating indefinitely if no measure is undertaken. While the interrelations in the model are indicated using arrows, these arrows do not imply a simplistic, unilateral, or causal relationship.

### 5.1 Interrelations between OGD production and OGD distribution (1)

My empirical evidence suggests that addressing user dissatisfaction with the OGD portal requires considering OGD production and OGD distribution as potential sources of dissatisfaction with the OGD portal. Moreover, my findings indicate that OGD

production drivers are interrelated with OGD distribution drivers. For instance, a dissatisfying search engine experience may be related to the lack of structural information about the datasets, hindering their discovery. Although the search engine is a driver of OGD distribution and the responsibility of the OGD portal, its efficiency is contingent on complete metadata provided by OGD producers. This example illustrates how a driver controlled by OGD producers, such as metadata completeness, may be interrelated to another driver controlled by the OGD portal, such as the search engine. Therefore, it is essential to consider the interrelations between these drivers and address them as part of a holistic approach.

The OGD community should thus address the drivers of OGD production and OGD distribution through a holistic approach, as dissatisfaction with the OGD portal is more likely to occur if the interrelations between these sources and respective drivers are neglected. The OGD community should thus foster collaboration by facilitating communication between the OGD producers and the OGD portal to ensure a shared understanding. As an illustrative example, the OGD providers and the OGD portal could set metadata standards, which capture essential information about the datasets needed for the search engine to be more efficient.

## 5.2 Interrelations between OGD production and OGD use (2)

My empirical evidence suggests that addressing user dissatisfaction with the OGD portal requires considering not only OGD production and OGD distribution but also OGD use as potential sources of dissatisfaction with the OGD portal. The results of my study suggest that drivers related to OGD production are interrelated with drivers related to OGD use. The empirical evidence indicates that dissatisfaction with the OGD portal is more likely if the produced datasets are not aligned with users' needs and preferences. This is particularly relevant since OGD production can determine the perceived value of the OGD portal and prevent it from being perceived as a data graveyard. Additionally, the results show how the characteristics of the produced datasets, such as their formats or timely updates, can impact their use. As an illustration, one participant said, *"I couldn't process the datasets in the format I got"*.

I may posit that understanding users' needs should not be regarded in isolation but rather in the context of what can be produced by the OGD producers. My empirical evidence indicates that dissatisfaction with the OGD portal may arise due to a misalignment between produced datasets and the users' needs. This is especially relevant since drivers related to OGD production are interrelated with those related to OGD use, creating a vicious circle. If produced datasets are not used, motivation to produce and publish datasets diminishes, and if data production is limited, motivation to use the data is also reduced. Consequently, it is crucial to consider the interrelations between these sources and respective drivers and address them as part of a holistic approach. The OGD community should thus foster a feedback loop for OGD producers and users. Engaging the dialogue should enable identifying areas where the produced datasets are not aligned with users' needs. The OGD community could help OGD producers to prioritise the production of datasets aligned with users' needs in terms of interest, format, or update, to mention a few examples. Accordingly, addressing the drivers of OGD

production and OGD use through a holistic approach could foster a shared understanding of users' needs and promote a collective effort to improve the OGD ecosystem.

### 5.3 Interrelations between OGD distribution and OGD use (3)

I may posit that drivers related to OGD distribution are interrelated with drivers related to OGD use. The results suggest an interrelation between drivers that influence the distribution of OGD and those that affect its use. Specifically, drivers related to OGD distribution play a fundamental role in OGD further use by creating a compelling reason for OGD users to visit the OGD portal. As illustrative examples, the accessibility of the datasets or visualisation options can influence users' perceptions of the added value of the OGD portal and their dissatisfaction with the OGD portal. For instance, participants would have required more visualisation options to assess whether the datasets were relevant to their needs quickly. Another key example is how users' perceptions of the added value of the OGD portal are interrelated to the centralisation of datasets.

My empirical evidence emphasises the need to consider the interrelated drivers that influence the distribution and use of OGD, as dissatisfaction with the OGD portal is more likely to occur if the interrelations between those sources and respective drivers are neglected. The OGD community should thus foster collaboration by facilitating exchanges between the OGD users and the OGD portal. For example, the OGD community could establish a users' advisory group to provide ongoing feedback, insights, and recommendations for improving the OGD portal or establish simple feedback mechanisms directly on the OGD portal. Moreover, the OGD portal could also organise workshops, webinars, tutorials, or any other educational programmes to enhance users' data skills and knowledge, which could help them navigate and use the OGD portal. Finally, the OGD community could foster communities of practice and discussion forums where users can share experiences and provide mutual support in using the OGD portal. This could help create a vibrant OGD ecosystem where the distributed OGD can be effectively used, and leverage added value.

## 6 Conclusion

While CIT has rarely been used in IS research, using CIT can inform practice by gaining valuable practical implications. It enables researchers to maintain scientific rigour while still meeting the interests of practitioners in applied settings [32]. In this sense, CIT provides relevant and concrete information for managers and can suggest practical improvement areas [33]. Accordingly, my study contributes to OGD research in two main ways.

First, this study proposes a descriptive model providing a framework that helps comprehend the interrelations between the sources and respective drivers of dissatisfaction with the OGD portal. Regrouping the critical incidents into drivers and again regrouping the drivers into higher levels of abstraction allows for identifying distinctive sources of dissatisfaction with the OGD portal. Identifying these sources and drivers is crucial as they may individually or jointly affect user dissatisfaction and the subsequent use of

the OGD portal. Addressing each source and driver allows to target of the responsible stakeholders, which is needed for prompt and tangible actions. For example, given that drivers related to OGD production and drivers related to OGD distribution are interrelated, close collaboration between the OGD portal and OGD producers is necessary to address drivers such as developing high-quality datasets or the organisation of the datasets. To do so, OGD producers could be forced to endorse a minimal data model, including regular updates for publishing datasets. At the same time, the OGD portal could ensure that the provided datasets comply with the specific requirements of the minimal model.

Second, this study provides some evidence of the importance of studying dissatisfaction. While previous studies have focused primarily on users' satisfaction, neglecting users' dissatisfaction limits the understanding of the users' experiences. Studying dissatisfaction provides valuable insights into users' experiences, particularly since individuals tend to remember dissatisfying experiences more vividly than satisfying ones [30]. Moreover, studying dissatisfaction provides new insights as drivers of (dis)satisfaction are not necessarily two extremes of a continuum. This means that even if certain features generate satisfaction, their absence may not necessarily affect dissatisfaction [41, 42]. While evaluating the OGD portal is not new, research on users' dissatisfaction is in its infancy. The empirical evidence presented in this study serves as a starting point for future research.

Finally, my research has some limitations that could be addressed in future research. Firstly, the results are limited as the focus is on a single national OGD portal. Therefore, future research should consider multiple OGD portals to understand users' experiences comprehensively. Additionally, the sample used in this study was limited to minimalist users, which does not represent the entire population of the OGD portal. While doing so allowed to identify the lowest common minimal standards of users' needs, future research should also include power users to obtain a broader understanding of users' experiences. Finally, while this study identified drivers of dissatisfaction, I call on future research to use quantitative methods to empirically measure the significance of the relationships among the drivers.

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