Open Government Data Awareness

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Open Government Data Awareness: Eliciting Citizens' Requirements for Application Design

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Abstract

Purpose - Over the past decade, governments around the world have implemented Open Government Data (OGD) policies to make their data publicly available, with collaboration and citizen engagement being one of the main goals. However, even though a lot of data is published, only a few citizens are aware of its existence and usefulness. Numerous communication methods exist to make citizens aware of OGD, including the use of dedicated applications. The purpose of this paper is to identify the requirements for an application that raises awareness of Open Government Data (OGD) to citizens.

Design/methodology/approach – This study followed a design research science approach to collect citizens' requirements for the design of such an application through interviews with 10 citizens and evaluated through user testing with 25 citizens.

Findings – This study identified and validated 11 requirements that can be implemented to raise citizens' awareness of OGD. The most useful are (1) listing OGD reuses with information about data used and (2) receiving notification when a new OGD reuse is released. Furthermore, the evaluation results provided evidence of the effectiveness of using an application to improve OGD awareness to citizens.

Originality/value – This research provides requirements that can be used by developers to implement a usable tool to raise citizen awareness or by researchers to evaluate applications whose objective is to raise citizen awareness. Finally, it provides a mobile application that can used by developers to showcase their OGD reuses or by researchers to aware citizens of OGD through real-world examples.

Keywords: Open Government Data, Citizens, Awareness, Communication Methods, Requirements, Mobile Application.

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1. Introduction

Across the globe, many governments have implemented Open Government Data (OGD) policies to make their data more accessible and usable by the public. In its most common definition, OGD refers to data published by governments that can be freely used and redistributed by anyone (Attard *et al.*, 2015). The release of such data is most often motivated by values such as improving government transparency (Bertot, Jaeger and Grimes, 2010; Janssen *et al.*, 2017), stimulating innovation (Davies, 2010; Johnson and Robinson, 2014), encouraging citizen collaboration and participation (Johnson and Robinson, 2014; Hivon and Titah, 2017; Purwanto, Zuiderwijk and Janssen, 2020). For these goals to be achieved, OGD must be used in some way, which requires that citizens be aware of OGD (Zuiderwijk, Janssen and Dwivedi, 2015). The term "awareness" in this study refers to two aspects: users know that OGD exists (existence) and users know the added value of OGD (usefulness) (Amugongo, Muyingi and Sieck, 2015; Attard *et al.*, 2015; Toots *et al.*, 2017; Gascó-Hernández *et al.*, 2018; OECD, 2019; Abdelrahman, 2021; Chokki, Simonofski, Frénay, *et al.*, 2022). Yet, even though a lot of data are published, only a few citizens are aware of its existence and usefulness (Toots *et al.*, 2017; Abdelrahman, 2021), which hinders achieving the goal of OGD initiatives. In this study, the term "citizens" refers to people with modest technical and data literacy.

Numerous communications methods (e.g., social media, public outreach campaigns, workshops and conferences, hackathons, training and education, public displays, applications, and word of mouth) have been proposed in previous studies to make citizens aware of OGD (Michael, Diana and Kate, 2014; Amugongo, Muyingi and Sieck, 2015; Gunawong, 2015; European Environment Agency, 2019; OECD, 2019; Berends, Carrara and Vollers, 2020; Clarinval *et al.*, 2021; Chokki, Simonofski, Frénay, *et al.*, 2022). In this study, we will focus more on the applicative aspect for the following reasons. First, based on these previous studies (Michael, Diana and Kate, 2014; European Environment Agency, 2019; OECD, 2019; Berends, Carrara and Vollers, 2020; Chokki, Simonofski, Frénay, *et al.*, 2022), the use of applications could be a great way to aware citizens of OGD. Second, existing applications to make citizens aware of OGD have limited features. For example, many OGD portals, which are primarily used to raise citizen awareness, focus more on publishing data than presenting the potential reuses of such data, which are more relevant to citizens, rather than the raw data. Furthermore, when the OGD are used in some reuses (e.g., applications or services), there is no highlighting of the use of OGD in the reuse or any information about the OGD used. Third, to the best of our knowledge, there are no studies in the literature addressing the requirements and the impact of an application on the awareness of OGD to citizens.

This paper aims to address these gaps by identifying the list of requirements needed in the design of an application to raise citizen awareness of OGD, implementing these requirements into a usable tool called CitizenApps and used it as proxy to evaluate the identified requirements. Therefore, our research question is formulated as follows: *"How to design a tool that* raises *citizen awareness of OGD?"* To answer the research question, we conducted a literature review for the requirements that need to be integrated into a tool to raise citizen awareness of OGD. Once the requirements were identified, we implemented them into a mobile application called CitizenApps. Unlike existing tools, CitizenApps provides additional features to facilitate citizen awareness to OGD such as: providing information of OGD used in each reuse, possibility to give feedback to reuse and possibility to get notify of a new OGD reuse. We conducted a user testing with 25 users to present the mobile application and gather feedback on its usefulness in raising citizen awareness of OGD, as well as additional features for future versions.

The remainder of this paper is divided into five main sections. In Section 2, we present the background related to citizen awareness of OGD. Section 3 explains the methodology used to address the research question. Section 4 presents the results of the tasks performed during research method. In Section 5, we present the discussion and limitations of this study, and then propose some avenues for future work. Finally, Section 6 provides a conclusion that summarizes the contributions of this paper.

2. Background: Open Government Data Awareness

The term "awareness" in this study refers to two aspects: awareness of the existence of OGD (i.e., users know that OGD exists) and awareness of the usefulness of OGD (i.e., users know the added value of OGD). In this study, we focused on open data exclusively *published by governments on portals* that can be freely reused and redistributed by anyone (Attard *et al.*, 2015). Raising awareness of the existence and the usefulness of OGD is one way to help governments to achieve their goals (e.g., transparency, reuse) for OGD initiatives (Souza, d'Angelo and Lima Filho, 2022). To this end, many communication methods are often used by governments around the world to make citizens aware of OGD (Michael, Diana and Kate, 2014; European Environment Agency, 2019; OECD, 2019; Berends, Carrara and Vollers, 2020; Chokki, Simonofski, Frénay, *et al.*, 2022). Figure 1 presents a collection of communications methods to raise citizen awareness of OGD. The use of applications has been shown as a great way to aware citizens of OGD in previous studies (Michael, Diana and Kate, 2014; European Environment Agency, 2019; OECD, 2019; Berends, Carrara and Vollers, 2020; Chokki, Simonofski, Frénay, *et al.*, 2022). Therefore, in this study, we will focus on this practical method.

Many applications have been developed in the literature to promote awareness of OGD to citizens. These applications include platforms developed to help users to easily access government data and also tangible examples of what can be done with published data (European Environment Agency, 2019; Berends, Carrara and Vollers, 2020). For example, OGD portals have offered visualizations (Ansari, Barati and Martin, 2022; Zhang *et al.*, 2022), dashboards and reuses built from the data in addition to raw data, raising awareness of the benefits of Open Data and showing what can be done with particular datasets (Berends, Carrara and Vollers, 2020). The shortcomings of OGD portals for awareness of OGD are that the reuses published focus only on the data published on the specific portal and developers are not able to collect feedback about the reuses they have submitted on the portals. Moreover, citizens are not able to be informed about new reuses submitted on the portals; at least they come to check on the portals that make citizens unaware of reuses that can facilitate their daily life. Another way to raise awareness among citizens is the development of practical applications and services accessible mainly on the web or mobile that use the data provided by governments and facilitate the daily life of citizens (e.g., the mobility application which helps Namur citizens to see the location of available parking in a specific area[1]). These practical applications are mainly developed either for a specific purpose or as federative applications to promote existing applications developed from open data (e.g., Datafruit[2] which summarizes in a mobile application the reuses of open datasets on the French portal). They can also be developed in the context of smart cities, as is the case for example in these studies (Anthony *et al.*, 2019; Anthony Jnr *et al.*, 2020). The main problem with these applications is that there is no information about the fact that the applications are built using open data and the information about the data used, so citizens use them without being aware of it. Like portals, these applications do not allow developers to collect feedback about their applications and citizens need to install multiple applications in order to access the different services provided by the applications.

[1] https://sti.namur.be/
[2] https://rb.gy/a8ehfw

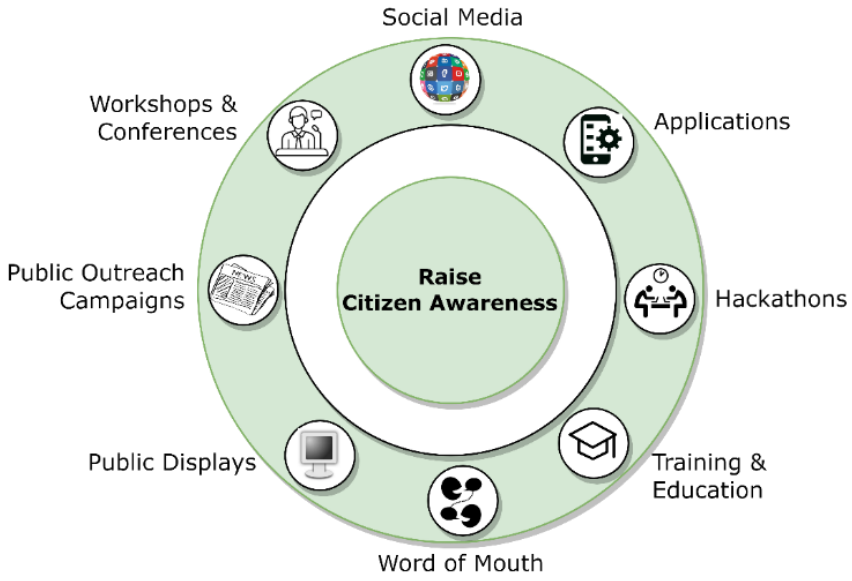


Figure 1: Communication methods to raise awareness of OGD.

All the gaps mentioned in the existing applications show that there is currently no application that adequately supports awareness of OGD. This justifies the need to identify the necessary requirements such an application should meet and to implement one fulfilling them. Therefore, we implemented CitizenApps, which differs from the existing applications in that it addresses each of their shortcomings. More details about CitizenApps and its added value over existing applications are presented in Section 4.

3. Research Methodology

To address the research question of this study, we followed the Design Research Science (DSR) methodology (Hevner *et al.*, 2004; Peffers *et al.*, 2007; Vaishnavi and Kuechler, 2007; Baskerville, 2008; Dresch, Lacerda and Antunes, 2015; Hivon and Titah, 2017). This research paradigm aims to develop solutions (artefacts) that meet defined objectives, contribute to the scientific knowledge base (rigor) and provide utility in the environment (relevance). The following paragraphs will explain the different tasks performed for each cycle of the DSR: rigor, design and relevance cycles.

In the **design cycle**, we recruited 10 students and researchers of different departments at the University of Namur in order to collect the citizens' requirements for the application. An incremental approach based on the agile methodology (Fowler and Highsmith, 2001) was later used to validate the requirements and progressively collect features, which is described as follows. First, we collected basic features from two citizens and then implemented them in the application. The developed application was then presented to another citizen for feedback and additional

features. This process was repeated several times, with different citizens each time, until no additional features were suggested by the citizens (Guest, Bunce and Johnson, 2006; Lallemand and Gronier, 2015). Starting with the seventh citizen, we found that no additional features were suggested, but there were more citizen comments to improve the user interface design.

In the **relevance cycle**, we evaluated the final prototype version obtained after implementing the requirements of the 10 citizens during the design cycle. The evaluation was conducted through a user testing followed by an online survey[3] to assess the effectiveness of CitizenApps for promoting OGD to citizens and to gather additional features for future versions. Apart from the survey, we asked citizens to give their opinion about their perception of the awareness of open data. This question was asked before and after the presentation of CitizenApps to citizens to assess whether the use of CitizenApps has an impact on their perception of the awareness of open data. We also asked citizens four additional questions to get their overall opinion of the implemented features: what features should be kept, improved, removed, or added in CitizenApps to raise citizen awareness of OGD? Using a convenience sampling method, 25 citizens were recruited through the following communication channels: first author's university mailbox and social media (Robinson, 2014; Emerson, 2015). This sampling method was chosen for two reasons. First, due to the COVID situation, it was impossible to recruit participants in public places. Therefore, participants were selected based on ease of access and proximity to the researchers. Second, given that the number of respondents was small, there were no exclusion criteria for participation in the survey, so all subjects were invited to participate in the process. Prior to filling out the survey, the participants were asked to install the application on their android phones and review the various features. The survey was pretested with two users to ensure that all kinds of errors associated with survey research were reduced (Grimm, 2010) and later shared on Facebook and Twitter to recruit the citizens. The survey included three types of questions: questions with a 7-point Likert scale (from “Strongly Disagree” to “Strongly Agree”) based on the Technology Acceptance Model (TAM) (Davis, 1989; Moreno Cegarra, Cegarra Navarro and Córdoba Pachón, 2014) to assess four aspects: attitude, perceived usefulness, perceived ease of use and behavioral intention; free text questions to collect general opinions and suggestions for additional features for future versions and to justify previous ratings; and 4 additional questions to collect demographic data. After collecting user feedback, the median, mean and standard deviation (SD) were calculated for the questions with a 7-point Likert scale to evaluate the four aspects. These statistical measures were chosen because they are the most

[3] https://forms.gle/b1dzdTgRBFjiYo1B9

appropriate for analyzing Likert data and for having a central tendency measure (Boone and Boone, 2012). Verbal thoughts and responses collected from the free text questions were coded using short sentences to retain context and conceptual relations.

In the **rigor cycle**, the requirements collected from the design and relevance cycles will be used to improve the current knowledge base.

4. Results

In this section, we present the results of the tasks performed during the three phases of DSR described above. First, we present the requirements that need to be implement in a usable tool to raise awareness of OGD among citizens and also present how the requirements were implemented in a mobile application called "CitizenApps" and evaluate its effectiveness to raise awareness of OGD among citizens.

4.1. Requirements Identification and Prototype Description

Based on the results of the interviews with citizens during the design cycle and the user feedback gathered during the design and relevance cycles, we are able to identify 11 requirements that need to be implemented in an application to raise citizen awareness of OGD. We are aware of the social, emotional, and motivational aspects of the adoption of OGD by citizens. However, it is important to note that in this study we focus more of the technical aspect of the problem. Table I presents the 11 identified requirements.

Table I should appear here

The requirements identified were implemented in a mobile application that we called "CitizenApps"[4] (available on Google Play Store). We chose to implement the prototype as a mobile application for the following reasons. First, according to this report[5] (2019), 92% young people were using their smartphones to access the internet outside of their homes or workplaces, compared to 52% who were using a laptop in this way. Second, with cell phones, it is easier to access a citizen's location in order to automatically offer them appropriate OGD reuses in their area (*R2*). Third, with cell phones, it will be easier to send notification to citizens about new OGD reuses without running additional campaigns (*R10*). Fourth, a mobile application is a great visual support on pocket to show everywhere (e.g., meeting room, bus, train) what can be done with

[4] https://url_available_after_review/
[5] https://rb.gy/ahkzzj/

open data without having to go into a browser and type in a link with the problem of forgetting the access link.

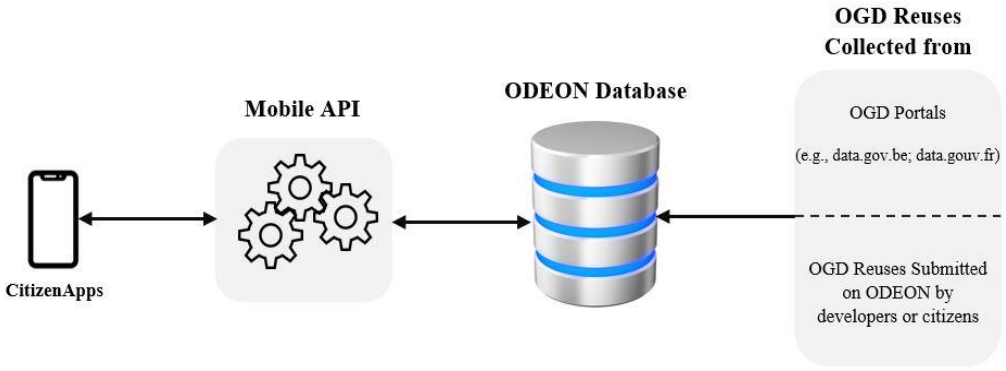
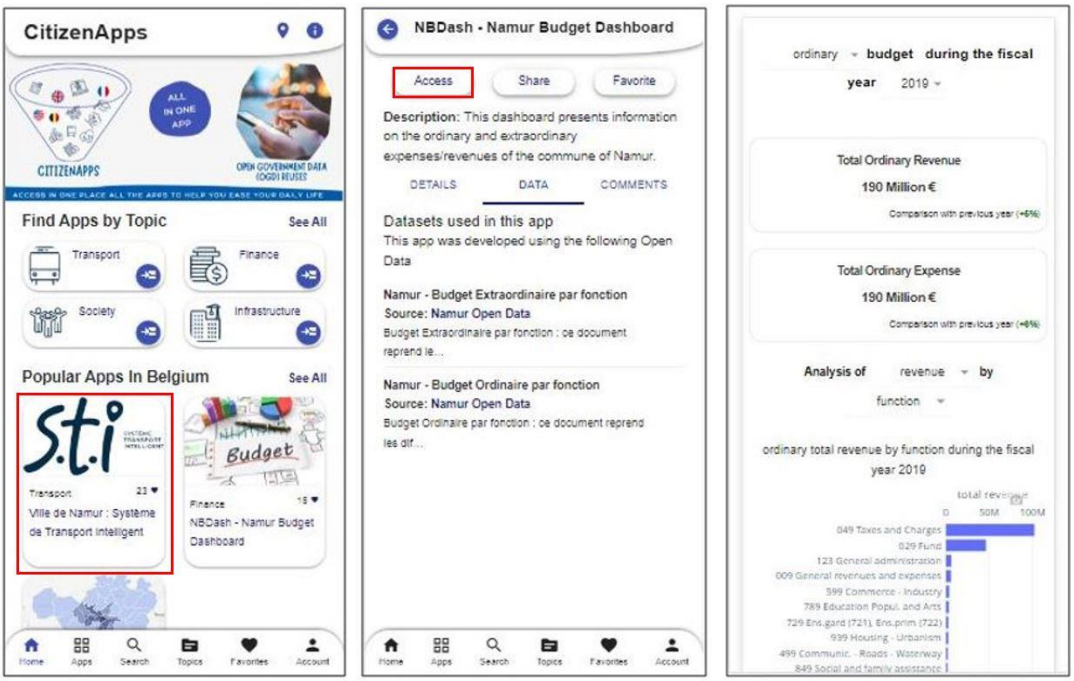


Figure 2: Architecture of CitizenApps. OGD reuses collected from governmental portals or reuse submissions are first stored in ODEON Database. Then, when the user launches "CitizenApps", the system first calls the mobile API to retrieve the necessary information.

The mobile application was built using the following technologies: Java (Programming language) and OneSignal[6] (notification plugin). Figure 2 presents the architecture of CitizenApps. The mobile application was supported by an API built on top of the ODEON platform (Chokki, Simonofski, Clarinval, *et al.*, 2022), a web application that aggregates several OGD reuses from different countries and also allows developers to register their OGD reuses themselves. Thus, once the OGD reuse is added to ODEON, it will also appear directly in the mobile application and a notification will be sent to citizens to inform them of the newly added OGD reuse. To date, the mobile application has 30 reuses from 4 countries: Belgium, France, Austria and Bulgaria. These reuses were selected based on data of proven interest to citizens in (Chokki *et al.*, 2021), such as data on transport, finance and health to name a few. However, it is important to note that other countries and reuses can be added into CitizenApps through ODEON. Screenshots of the prototype are shown in Figure 3.

[6] https://onesignal.com/



(1) HomePage (2) Details of an App (3) Run App

Figure 3: Screenshots of CitizenApps. (1) shows the homepage where we list the most important topics and some popular applications; (2) shows the details of an application when the user clicks for example on "NBDash – Namur Budget Dashboard" from the homepage; (3) shows the live application when the user clicks on the "Access" button.

4.2. Evaluation Results

Through the surveys that participants filled out after exploring the mobile "CitizenApps" application, we were able to gather their opinions. A total of 25 participants completed the surveys. All participants are between the ages of 18 and 50 and have at least a high school degree.

Table II presents the median, mean and standard deviation of the questions with a 7-point Likert scale regarding the 4 aspects (attitude, perceived usefulness, perceived ease of use, behavioral intention) evaluated for the prototype. The following conclusions can be drawn from the results of Table II. Citizens' attitude towards the use of CitizenApps is favorable in general as evidenced by the median & mean attitude ≥ 5 and the standard deviation is low (SD = 0.59) showing that citizens' scores tend to be close to the mean of citizens' scores. Citizens also agree that CitizenApps is useful to them in better understanding the existence of OGD and its usefulness (median & mean ≥ 5 for perceived usefulness and citizens' scores tend to be close to the mean of citizens' scores (SD = 0.74)). This is also reinforced by the fact that before showing CitizenApps to citizens, we asked them "what was their perception of the usefulness of OGD to the public?" Only two participants were able to give us a clear example of how OGD can be used in real life. However, after the CitizenApps presentation, all participants agree on their usefulness and some were surprised by the fact they are already using them without knowing it. Citizens also find

CitizenApps easy to use (median & mean ≥ 5 for perceived ease of use and citizens' scores tend to be close to the mean of citizens' scores (SD = 0.59)). This is justified by the fact that many citizens think that CitizenApps was well designed and user-friendly. However, citizens' intention to use CitizenApps was somewhat lower than previous aspects but was acceptable (median & mean ≥ 4 and SD = 1.19 for behavioral intention). This may be due to the fact that some citizens see only a few applications that interest them in CitizenApps, as only 30 applications have been added so far for testing purposes.

Table II should appear here

Regarding the feedback on implemented features in CitizenApps, all participants agreed that the features implemented should be kept. However, 4 participants suggested removing the login feature that was required to address R9 (quick access to favorite OGD reuses), as its added value is only to help users to add certain applications to their favorites. Apart from that, participants did not suggest any additional features, as many of them think that the existing features are already sufficient and it is better not to add any more to avoid making the application difficult to use. In terms of features that could be improved, participants suggested adding more applications to CitizenApps to increase the interest of the CitizenApps for users.

5. Discussion

This research contributes to both theory and practice. The following sections present these contributions as well as limitations and future work related to this research.

5.1. Theoretical Contributions

This research contributes to theory in the following aspects. First, we contribute to the identification of citizens' requirements for the design of an application to improve OGD awareness. A total of 11 requirements (see Table I) are identified. To the best of our knowledge, this research is the first study to identify citizens' requirements for the design of an application to improve OGD awareness. These identified requirements can be used by developers or practitioners to implement a usable tool to raise citizen awareness or used by researchers to evaluate applications whose objective is to raise citizen awareness. Second, the identified requirements are formulated in a generic manner and thus can be implemented in a variety of ways. Third, the findings of the evaluation provide preliminary evidence that the use of an application implementing the identified requirements can improve citizen awareness of the existence and usefulness of OGD.

5.2. Practical Contributions

This research also contributes to practice in the following aspects. First, we present through a concrete tool (CitizenApps) how to implement the different requirements (see Table I). Thus, the implemented mobile application as well as the description of the implementation of each requirement can be a source of inspiration for developers or OGD managers on how they can implement the requirements in their existing or new platforms in order to improve OGD awareness. Second, since CitizenApps is a federated application that can include OGD reuses (collected from developers or external platforms such as OGD portals), the implemented mobile application can be used by developers to showcase or promote their OGD reuses or by researchers to explain to citizens the usefulness of OGD with real-world examples. Third, CitizenApps addresses the shortcomings of OGD portals and topic-based applications (e.g., Datafruit, WallonieEnPoche[7]) by integrating the following requirements: *R2*. Categorize OGD reuses (especially by country), *R5*. See details about OGD reuse (especially the list of datasets used in each OGD reuse), *R7*. Provide feedback on OGD reuse, *R10*. Receive notification (especially when there is a new OGD reuses in the citizen area) (see Table I).

5.3. Limitations and Future Work

This research has some limitations that will need to be addressed in future work. The first limitation concerns the representativeness of the participants in the both surveys. From a statistical point of view, we note that there are limits to the conclusion validity. The number of participants may be small, especially for the evaluation survey, but referring to previous studies (Nielsen, 2000; Faulkner, 2003), the use of at least 5 participants for usability tests is a good baseline. However, to increase this representativeness, we suggest using other communication channels or collecting data on-site in universities or public places. In this study, this was not feasible due to the COVID-19 situation. The second limitation is the use of convenience sampling method to recruit participants, this may have a bias on the validity of these findings however we tried to reduce that bias by also recruiting participants through social media. Future work will be to improve the validity of the identified requirements with a large number of participants from different backgrounds by using a random sampling method, which was not possible in our case due to the small number of participants responding to the survey. The third limitation is that this research focuses only on the technical aspects of the issue related to the citizen awareness of OGD.

[7] https://wallonie.enpoche.be/

Other researchers can extend this work by integrating the social, motivational and emotional aspects of the issue, which will be necessary to address the previous limitation.

6. Conclusion

The purpose of this paper was to identify the requirements for an application that raises awareness of OGD to citizens. To achieve this objective, we conducted interviews with 10 citizens to collect requirements that need to be implemented in such an application. Next, we implemented the requirements in an application we called "CitizenApps". Finally, we examined whether the identified requirements can raise awareness of OGD through an evaluation conducted with 25 citizens using the implemented application as proxy.

The iterative interviews with citizens help to propose and validate a list of 11 requirements (see Table I) that need to be implemented in a usable tool to raise awareness of OGD. Among the 11 requirements, the following requirements are considered as the added value compared to existing solutions: R2. Categorize OGD reuses (especially by country), R5. See details about OGD reuse (especially the list of datasets used in each OGD reuse), R7. Provide feedback on OGD reuse, R10. Receive notification (especially when there is a new OGD reuses in the citizen area). The findings of this study can be a baseline for developers and governments to build a usable tool to raise citizen awareness and thus facilitate the achievement of OGD initiatives. They can also be used by researchers or application reviewers to evaluate applications whose objective is to raise citizen awareness.

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Tables

Table I: List of requirements to design a tool that can raise awareness of OGD among citizens.

Requirement	Requirement description	Implementation in CitizenApps	Added value compared to existing applications
R1. List of OGD reuses	Possibility to see OGD reuses with information about their title, description, associated topic (e.g., transport, finance, etc.).	OGD reuses were collected from "reuses" section of some government portals (e.g., Belgium portal[8], French portal[9], portal for European data[10]) and from reuses posted by developers and citizens on ODEON (Open Data Exchange solutiON) platform (Chokki *et al.*, 2022).	Compared to OGD portals or other applications (e.g., Datafruit, WallonieEnPoche and SNCB) that only focus on specific regions or topics or offer a specific service, CitizenApps is designed to aggregate OGD reuses for different topics and countries.
R2. Categorize OGD reuses	Possibility to categorize OGD reuses or to search for OGD reuses.	Ability to search for OGD reuses based on the following criteria: country, state, topic and keywords. In addition, since many participants were interested in OGD reuses in their region or by a specific topic, we provided quick access to OGD reuses by country or topic.	CitizenApps differs from other applications in that it allows searching by country and state which is not available in other applications since they focus on a specific country or topic.
R3. List of success stories of OGD reuses	Possibility to present citizens a list of OGD reuses that have an impact in the daily life of the citizens.	Attract more citizens by presenting them with the list of OGD reuses they have commonly used in the daily life or bookmarked in CitizenApps. The list of success stories is by default defined by us based on applications used in the daily life of the citizens like SNCB which is for example an application for train route schedules in Belgium.	This requirement to highlight key success stories in a specific area does not exist in the existing applications.
R4. List of latest OGD reuses	Possibility to view recently added OGD reuses to the application.	Ability to list recently added OGD reuses in the ODEON platform to citizens.	-
R5. See details about OGD reuse	Possibility to view details of OGD reuse.	Ability to view details of OGD reuse such as: title, description, associated topic, associated country/state, contact	Details such as the associated country/state, list of datasets used and user comments provide added value over existing applications.

[8] https://data.gov.be/
[9] https://www.data.gouv.fr/
[10] https://data.europa.eu/

		information, list of datasets used and list of user comments.	
R6. Execute OGD reuse	Possibility to access or execute OGD reuse.	Possibility to access or execute OGD reuse without leaving CitizenApps if it is hosted online.	This requirement is more user-friendly within CitizenApps since the user does not need to exit CitizenApps before running the application thanks to the webview feature of the mobile application.
R7. Give feedback on OGD reuse	Possibility to provide feedback to the OGD reuse's developer in order to improve the OGD reuse.	Possibility to rate and let comments on OGD reuse.	This requirement does not exist in the existing applications.
R8. Share OGD reuse	Possibility to inform friends about the existence of a specific OGD reuse.	Possibility to share by email a specific OGD reuse.	This requirement does not exist in the existing applications.
R9. Quick access to favorite OGD reuses	Possibility to facilitate access to the favorite OGD reuses of the citizen.	In order to achieve this requirement, CitizenApps first allows users to create a free account. Then once logged in, users can then add an OGD reuse to their favorites, so they will not need to go through a search every time before running their favorite reuses.	This requirement does not exist in the existing applications.
R10. Receive notification	Possibility to receive notification when new OGD reuses are published.	Ability to receive notification when new OGD reuses are added in ODEON platform.	This requirement does not exist in the existing applications.
R11. Easy to use and intuitive	Facilitate the use by citizens even with low technical skills.	Organize the functionalities into a pleasing layout after collecting feedback of citizens and an UX expert.	-

Table II: Median, mean and standard deviation (SD) of survey scores.

	Attitude	**Perceived usefulness**	**Perceived ease of use**	**Behavioral intention**
Median	6	5	6	5
Mean (SD)	5.93 (0.59)	5.47 (0.74)	5.93 (0.59)	4.9 (1.19)