Citizen Participation: Case Study on Participatory Apps in Germany

Agnes Mainka
Department of Information Science
Heinrich Heine University
Düsseldorf, Germany
agnes.mainka@hhu.de

Tobias Siebenlist
Department of Information Science
Heinrich Heine University
Düsseldorf, Germany
tobias.siebenlist@hhu.de

Lisa Beutelspacher
Department of Information Science
Heinrich Heine University
Düsseldorf, Germany
lisa.beutelspacher@hhu.de

ABSTRACT

Participatory smartphone apps empower citizens to interact with the city's administration. The purpose of this case study is to investigate the current state of participatory apps in Germany. The 29 apps that have been found can be categorized into four topics: *Information Awareness*, *City Service*, *Transparency* and *Public Safety*. Most citizen apps can be assigned to the category *Travel & Local*. None of the identified apps is based on open-source code, and the citizens' reports are not publicly visible, e.g., for other citizens. It is unclear to whom the data generated by citizens belong.

CCS CONCEPTS

• **Applied computing → E-government**;

KEYWORDS

Smart City; E-participation; Citizen participation; Transparency

ACM Reference Format:
Agnes Mainka, Tobias Siebenlist, and Lisa Beutelspacher. 2018. Citizen Participation: Case Study on Participatory Apps in Germany. In *WWW '18 Companion: The 2018 Web Conference Companion, April 23–27, 2018, Lyon, France.* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3184558.3191518

1 INTRODUCTION

Through digitization and mobile phones, citizens become able to communicate anywhere and anytime with their government. This possibility may lead to increased transparency and enhanced democracy. Smart Cities are not only about becoming smart by using technology but also by empowering citizens to interact with their city and in particular with their city or municipal administration. This kind of interaction is called E-participation, and it is recognized as a key factor in developing Smart Cities [5]. Citizens create knowledge regarding their city and thus help their city and their fellow citizens to improve the city further and make it a comfortable place. Citizens interacting with the public service expect efficiency and effectiveness as well as social values [1]. In this study, we are going to investigate whether smartphone applications exist to involve citizens in city's development, decision making, and administrative processes. As a case study, we investigate currently available apps in German municipalities and compare the offered topics, features, and usefulness of these apps.

WWW '18 Companion, April 23–27, 2018, Lyon, France

ACM ISBN 978-1-4503-5640-4/18/04.
https://doi.org/10.1145/3184558.3191518

2 METHOD

The apps investigated in this paper have been found using the search engines Google and Bing. As search terms, we used the German terms "Melde App" ("report app") and "Bürger App" ("citizen app") as these are the commonly used terms for this kind of apps in Germany. We considered the result pages one to five from Bing and Google. Through this retrieval method, we only found those apps that are ranked high in the respective search engine and thus can be found by citizens easily. Searches within the Google Play Store or Apple App Store have not increased the number of identified citizen apps. The research was conducted between January 15th and 16th, 2018 and relies on the data which was available online at that time. In total, 29 mobile applications (29 Android apps, 27 also available for iOS), one web application and one community calendar were found. Further on we will only investigate the 29 apps available at least in one app store. To identify the topics and features of each application, an intellectual content investigation was needed. Accordingly, we established a coding scheme inspired by the typology and features of m-apps by Mainka et al. [4]. The identified topics and features will be explained in the results. The data has been coded by one indexer to prevent inter-indexer inconsistency. The usefulness of apps is defined here by their spreading. Therefore the number of downloads for all apps available in the Google Play Store were considered for this purpose. The Apple App Store does not provide this information. Further metadata was retrieved to compare the app size in MB or the latest update as the external cause of the popularity of an app.

3 RESULTS

The apps investigated could be categorized into four topics: 1. Information Awareness, 2. City Service, 3. Transparency, and 4. Public Safety (Figure 1). One app may fall under more than one topic in this categorization schema. The most common topic of the 29 apps investigated is "City Service" with the subtopic "Problem Identification" (22 apps) which allow users to commit problems like a broken light, graffiti or a pothole. As shown in Figure 2 except for two apps it is possible for the user to add a photo (using the camera of the smartphone) and GPS position with the report. In one case it was not clearly described in the app description if the location can be added via GPS. Only in 13 cases identified problems are visualized on a map within the app and even just in nine cases the user is getting feedback on the problem resolution. Many citizen apps are developed to enhance the citizen's information awareness.

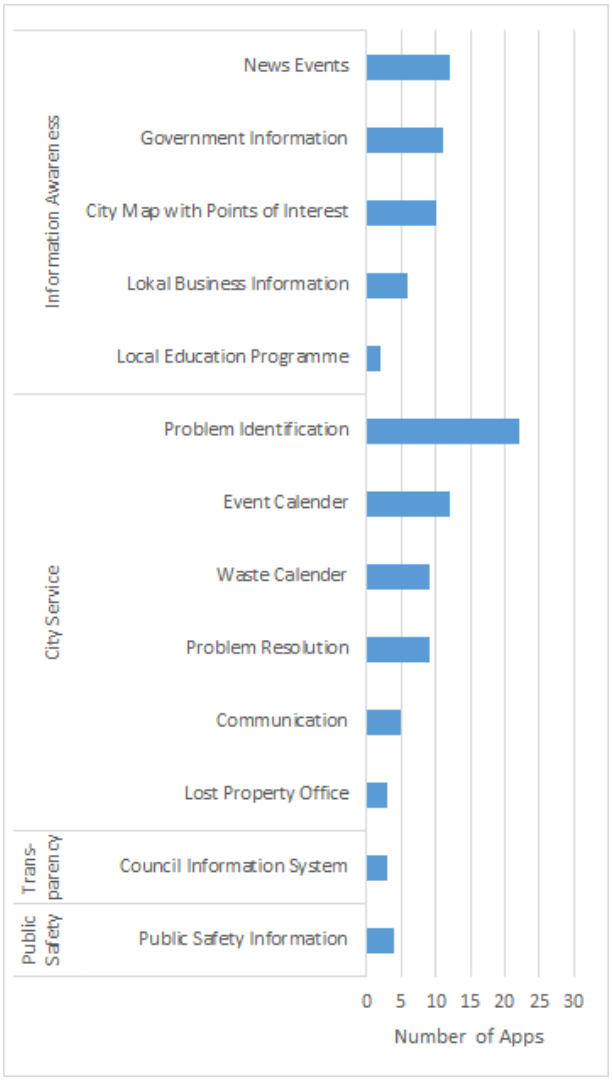

Figure 1: Citizen Applications categorized by Topics

Here we identified various subthemes that are mentioned in the app descriptions (Figure 1). 12 apps share local news, and events and 11 apps allow searching for governmental information like contact details of council members. Some apps also visualize points of interest on a city map which makes the app attractive for citizens as well as for tourists. In six cases local business information are available, and even in two cases users can inform about and book courses of the local adult education center (VHS).

Local calendars are also popular in citizen apps. We found that 12 apps offer a local event calendar and nine a local garbage pick up schedule. Only in five apps, direct communication with the local municipality was offered. Three apps are also interlinked with the municipalities lost and found office which allows users to report a loss directly. Furthermore, some apps are as well developed to enhance the transparency of a municipality. Through a "Council Information System" citizens can inform themselves on current

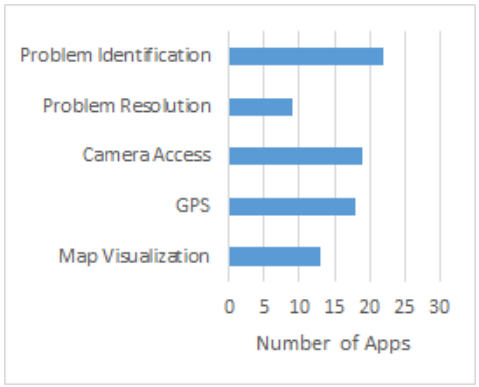

Figure 2: Features of Applications with the topic Problem Identification

decision-making processes in their municipality. It offers access to the calendar of the council chamber meeting and to the current documents which are regularly updated. Finally, citizen apps may also offer push notifications on current events, weather alerts or disaster warnings. One app, called *Biwapp*, was developed only for this purpose for the whole nation and three other apps offer "Public Safety Information" in addition to other topics.

In total, 23 different software developers for citizen apps have been found through our retrieval method. In six cases the municipality has developed a new citizen app together with a software company. Seven municipalities are using an app developed by *style-flasher GmbH*, five an app by *Obisoft*, two an app by *komuna GmbH* and another two by *nerdgeschoss GmbH*. We further identified apps that are developed for a whole region like the app "Maerker Brandenburg" including 105 municipalities by *Six Offene Systeme GmbH*, or the app "MängelMelder" RLP for the federal state Rheinland Pfalz developed by *Innowis GmbH*. One app also has the approach to serve for all municipalities in Germany called "Mängelmelder Deutschland" ("fault notifier Germany") by *wer denkt was GmbH*, but it only covers 30 municipalities while the app "Bürger-App City Hub" developed by *Microhub GmbH* counts 50 municipalities. The Appendix contains the full list of developers and identified apps.

As listed in Table 1, the citizen apps are not downloaded very often. Mostly those apps are downloaded between 1,000 and 5,000 times in the Google Play Store which offers apps for the operating system Android. One app was downloaded between 5,000 and 10,000 times. The only purpose of this app is to offer access and to manage council information and schedules. The app is called *ALLRIS* and is available for citizens and council members as well. Considering that the app is available in 69 municipalities the number of downloads is very low. The three apps that are downloaded between 10,000 and 50,000 times have in common that they all offer the topic "Problem Identification". Two apps are developed for cities: Osnabrück with a population of about 150,000 and Hamburg with a population about 1,760,000. The third app is developed for whole Germany. The apps for Osnabrück and Germany also give feedback on the "Problem Resolution" and visualize all reports on a map. The app for Hamburg is a service of the local city cleaning department and therefore only offers, besides, a waste calendar and further information on

Table 1: Download numbers of Citizen Apps

Downloads	Count
50-100	1
100-500	6
1,000-5000	15
5,000-10,000	1
10,000-50,000	3
50,000-10,000	2

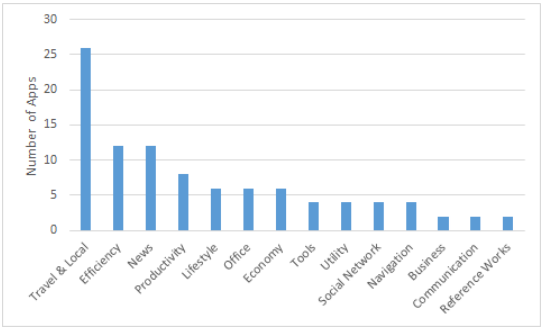

Figure 3: Citizen Apps assigned to Categories in the Google Play Store and Apple App Store

waste management. The two most downloaded apps are *Biwapp*, the public safety information service on the national level and *Köln-Service App* a citizen app for Cologne (population about 1,047,000) that includes citizen services like a reporting system and event and waste calendars. The latter one also contains governmental information, news and event information as well as information on the local educational programme.

Metadata on the latest update of the apps are available in both app stores for Android and iOS. The Apple App Store publishes, in addition, a history of all updates and thus allows to identify the first upload of the app. But if it is the first app version than the data is not available. As shown in Table 2 the most apps are updated at least in the past six months (>06/30/17) or 12 months (>01/01/2017). Five Android apps have not been updated longer than one year. For example, the app "Maerker Brandenburg" which was developed for the whole federal region was updated most recently in July 2014 for Android and in November 2016 for iOS. This can also be observed for the citizen app of Wolfsburg which offers a newer version for iOS users. In two cases, the apps have been developed once but never updated again. If an app is updated does not correlate with its first development date. For instance, the "Mängelmelder Deutschland" (report app Germany) was first published in January 2011 and recently updated in November 2017 for Android and December 2017 for iOS users.

Finally, we identified that the apps had been assigned in diverse categories regarding both app stores. In the Play Store, most citizen apps can be found in the category *Travel & Local*. In the Apple App Store most apps are categorized under *News* and *Productivity*. However, a common categorization schema cannot be found which makes it difficult for users to search for and find those apps.

4 DISCUSSION

One prevalent example of a reporting app is from the US called *fixmystreet.com* which was developed as open-source project in 2011. In Germany, we could not identify any municipality using *fixmystreet.com* with our research method. In our case study, we identified diverse software developers and approaches of "citizen apps." Often a running system is bought by a municipality, or they join a regional system to reduce costs. However, reports and discussions in local media highlight that the cost of smartphone applications are still a major impediment for municipalities to offer "citizen apps." Looking at our results, the apps investigated have meager download rates. Taking into account that only the download numbers of Android apps are available and Android, as well as iOS, are the most used operating systems, it is unlikely that the numbers would be much higher for iOS. In Germany, participation and citizen apps are still in its infancy, and it should be investigated how citizens could be reached. Municipalities should meet the citizens' needs or motivate them to engage [2]. One problem is that the data generated by the citizens is not openly accessible. Looking at the citizen management system 311 in the US all data can be accessed online in a machine-readable format [3]. Hence, to investigate the usefulness one could count the user reports and problem resolutions. Furthermore, it could be examined whether problems like graffiti or waste on streets have increased or decreased in some neighborhoods.

5 CONCLUSIONS

The results of our case study show that there are some different participation apps mainly developed on a per city basis. Where an app covers several cities or municipalities, it is not clear which cities or municipalities these are. Thus it is hard to figure out for citizens if there is an app for their city. Diverse software companies have developed the mentioned apps, and none of these apps is an open-source app. Besides the apps not being open-source, there is no information about data handling. Citizens can use these apps to report a problem but there are not publicly visible lists of reports like it is done by *fixmystreet.com*. Transparency is essential to enhance the trust in government activities [6] and should be realized in those apps. The reporting lacks transparency, and furthermore it is not only unclear where the data will be sent but even more to whom the data belongs.

A IDENTIFIED APPS

In the following Table 3, all identified apps are listed with their respective developers and additional information.

Table 2: Download numbers of Citizen Apps

Play Store (29 apps)			Apple App Store (24 apps with history metadata)		
0-6 months ago	6-12 months ago	> 12 months ago	0-6 months ago	6-12 months ago	> 12 months ago
17	7	5	15	7	2

Table 3: Overview of investigated apps

Name	City	Developer	Developed by City
Bürger-Service-App Dresden	Dresden	Dresden Information GmbH	yes
Osnabrück App	Osnabrück	Stadt Osnabrück, cybob communication GmbH	yes
Melde-App Arnsberg	Arnsberg	Obisoft	no
Melde-App Stadt Gladbeck	Gladbeck	Obisoft	no
Melde-App Stadt Recklinghausen	Recklinghausen	Obisoft	no
Melde-App Stadt Buchholz	Buchholz	Obisoft	no
Melde-App Salzgitter	Salzgitter	Obisoft	no
bol Meldeapp Stadt Wolfsburg	Wolfsburg	Stadt Wolfsburg (bol)	yes
Cas-APP	Castrop-Rauxel	Castrop-Rauxel, blueBOX Medienagentur	1
Kölner Service-App	Köln	Stadt Köln Online-Redaktion	yes
Bürger-App	Nittenau	komuna GmbH	no
Bürger-App Dorsten	Dorsten	Stadt Dorsten	yes
Die Marktoberdorf App	Marktoberdorf	komuna GmbH	no
Stadtreinigung Hamburg	Hamburg	Xcontrol GmbH	no
Civitas	Ellwangen-Pfahlheim	Patrick Vaas	no
Wölfersheim GemeindeApp	Wölfersheim	nerdgeschoss GmbH	no
Limeshain GemeindeApp	Limeshain	nerdgeschoss GmbH	no
BürgerApp - Nussbaum Medien	Walldorf und St.Leon-Rot	Nussbaum Medien St.Leon-Rot GmbH & Co. KG	no
ALLRIS	69 cities/municipalities	CC e-gov GmbH	no
anRICH Bürger	69 cities/municipalities	STERNBERG Software GmbH & Co. KG	no
buergermeldungen.com	7 cities	styleflasher GmbH	no
Hildrizhausen	Hildrizhausen	aaronprojects GmbH	no
Maerker Brandenburg	Brandenburg (with 105 municipalities)	Six Offene Systeme GmbH	no
MängelMelder RLP	federal state Rhineland-Palatinate	Innowis GmbH	no
Mängelmelder Deutschland	more than 30 cities/municipalities	wer denkt was GmbH	no
MEINE GEMEINDE APP	5 cities/municipalities	adKOMM Software GmbH & Co. KG	no
AKDB	rural district Miltenberg (32 municipalities)	AKDB	no
Bürger-App City Hub	more than 50 cities/municipalities	Microhub GmbH	no
Biwapp	-	Marktplatz GmbH - Agentur für Web & App	0

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