

CITIZEN REPORTING SYSTEMS IN THE GLOBAL AND CZECH SPECIFIC VIEW

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Abstract. Urban areas have to face many problems rising from the concentration of people on limited space. Solving these problems is a matter for the public administration, especially those serious issues as unemployment, security, scarcity of housing, air pollution, etc. However, digital technologies enabled citizens to participate on solving some issues visible to them. Citizen reporting systems offer citizens fast and very simple way to draw attention to a problem in a particular territory (damaged benches, mess, broken pavement, uncut grass, landfills, etc.). We can distinguish mainly three types of citizen reporting systems: web based; module, which is part of city mobile application; and specialized mobile application for issue reporting. Such systems use citizens as sensing devices gathering data that help cities make their operations more flexible. This way of participation activates people to care about place they live - their city. Smart cities need active people who care and feel responsible for the city that is why the participation is one of main pillars of smart cities. Through the literature review, this article summarizes the use of citizen reporting systems in the global context and compares it with the situation in the Czech Republic. Analysis of city applications of regional capitals reveals if they use some citizen reporting system and if yes, what types do cities use.

Keywords: participation, technology, cities, citizen reporting systems, citizens

JEL Classification: H70, O33

1. Introduction

Citizen reporting is part of citizen sourcing techniques, together with consultation, ideation, and co-delivery (Linders, 2012). Citizen sourcing uses the same techniques as crowdsourcing though the purpose is specific. Citizens form the crowd that acts in the public interest. Citizen sourcing can have the same forms as crowdsourcing – some of them more passive (citizen as sensor) and some of them more active (citizens bring ideas, actively report or coproduce services). Especially this form of citizen sourcing based on active participation is in the forefront of expert interest. The importance of citizen participation and engagement emphasizes many authors (eg. Ho & Coates, 2004; Nabatchi, Sancino, & Sicilia, 2017; Neshkova & Guo, 2012; Máchová et al, 2018; Swindell & Kelly, 2000; Wu & Jung, 2016) and organizations. For example OECD (2001) reported “engaging citizens in active participation in policy-making is the most advanced way of strengthening government-citizen relations. It means that government acknowledges and supports citizens’ own, autonomous role in the relationship“(OECD, 2001; p.60). Kopackova (2018) have studied citizen participation in the context of citizens’ needs and formulated higher citizens’ needs. Local

governments can support satisfaction of citizens' higher needs "by giving them the possibility to be heard, participate in the public matters, express an opinion on the state of affairs, etc." (Kopackova, 2018; p. 2). Michels and De Graaf (2010) have studied impact of citizen participation on local policy making. Although their findings show that the role of citizens is limited, "citizen involvement in policy making makes people feel more responsible for public matters and increases public engagement. A second positive effect of participatory policy making is that it encourages people to listen to a diversity of opinions and thus promotes mutual understanding, which, however, does not automatically imply that they are also willing to shift preferences. Thirdly, it contributes to a greater legitimacy of decisions" (Michels and De Graaf, 2010; p. 489).

Citizen reporting is a very broad concept covering all activities of citizens in which they actively report some incident or problem they witnessed. We can distinguish citizen reporting based on two parameters; (1) the level of urgency, and (2) the motivation of reporters.

Incidents that are life threatening or such incidents with a danger of delay use different reporting systems than non-emergency incidents. In the research literature, there is no precise differentiation between emergency and non-emergency incidents, which is why we use official recommendations for citizens as a source. For example, Northern Illinois University Department of Police and Public Safety explain, "an emergency is a serious, unexpected, and often dangerous situation requiring immediate action and that may result in personal injury or damage to property" (NIU, 2018). Another example is from Racine county Wisconsin "when immediate action is required: someone's health, safety or property is in jeopardy or a crime is in progress" (Racine county Wisconsin, 2018). We could continue with the list of recommendations; nevertheless, common signs of emergency incident are obvious. Emergencies need fast response therefore reporters should use national emergency hotline if there is only one or national emergency phone numbers for ambulance, fire, and police. In the USA there is one hotline 911. European Union introduced 112 hotline; however, member states still have their national hotlines or dedicated phone numbers eg. 999 in the UK (Victor et al, 1999); 110 in Germany; 150, 155, 158 in the Czech Republic (Travel.State.Gov, 2018).

Non-emergency incidents can also be reported by phone. Some American cities have implemented 311 hotline (Offenhuber, 2014) as the counterpart for 911, while in the UK there is 111 and 101 for non-emergencies (Turner et al, 2013). Nevertheless, cities mostly use their own numbers for reporting non-emergencies. The development of information technologies brought also other options for the reporting of non-emergencies. Electronic forms represent the easiest way to report. With the enhancement of geolocation (mesh up of online maps or specialized GeoWeb), the incident can be located more precisely. New form of reporting brought mobile phones and applications specialized on reporting of non-emergencies. None of these forms is suited for emergency incidents but their role in reporting non-emergencies is indisputable.

Different motives also determine the way of reporting. First motive why people report about some incident is that they want to share some experience with others. They do not seek for the solution of problem they are just interested and think that other people will be too. In this situation, people usually use social networks (Twitter, Instagram, Facebook, etc.). Entirely different reason for reporting have people involved in the incident in any way who want to solve it. If there is simple way how to contact responsible authority with high probability of success, especially some application, which meets the quality requirements

(Simonova & Foltanova, 2017), then people use this official way. However, not all authorities react as expected. In this case, people use publicity as the form of pressure or escalation. They mostly report the problem through specialized web or mobile application or they form discussion groups but at the same time push responsible authorities to do their job. Fedor Gorozhanko, the developer of web application Zalivet.spb explained it clearly: “Since 2012 I've been adding everything to the map: to visualize the problem, for mass-media and also for a kind of psychological pressure. Because when an official sees that he has a problem in his district, he knows that his superior can also see it, and so he tries to repair it as soon as possible” (Ermoshina, 2014). To summarize the motives of reporting, people report the problem publically for amusement or as the form of psychological pressure on responsible authority. In other case, they use direct channel to inform responsible authority.

This chapter revealed that citizen reporting systems differ according to the urgency of the incident and motivation of reporter. Although we know this field is rapidly developing, we try to summarize currently available types of citizen reporting systems:

- Hotlines 24/7 - mostly used for emergency incidents.
- Phone number within work hours – non-emergency incidents, direct communication.
- E-mail - non-emergency incidents, direct communication.
- Electronic form (with or without geolocation) - non-emergency incidents, direct communication.
- Municipal GeoWeb showing the state of solution of reported incidents in the city with possibility to add new - non-emergency incidents, direct communication, publicity, an overview of problem status.
- Municipal mobile application with the module for reporting - non-emergency incidents, direct communication, usually publish state of the solution.
- GeoWeb or mobile application operated by third party, related to a wider area than the city, specialized on reporting - non-emergency incidents, escalation, publicity, usually publish state of the solution.
- Universal mobile application for cities, covering different topics with the option of reporting - non-emergency incidents, direct communication.
- Social networks - non-emergency incidents, publicity, amusement.

Phone calls and e-mails contain only limited amount of structured information therefore human factor is necessary to decode the report. Whereas all other forms of citizen reporting systems contain semi-structured information that can be used for automated processing.

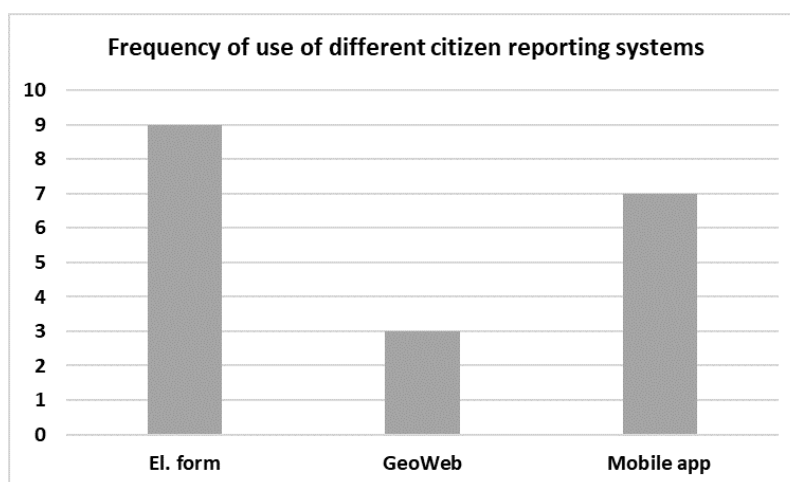
2. Methods

This paper evaluates the accessibility of citizen reporting systems in 13 Czech regional capitals. The process of evaluation covered finding of city web pages and searching for the information how to report non-emergency incident. As the range of non-emergencies is too width, we had to narrow the scope. Evaluators acted as ordinary citizens who want to report incidents considering municipal property: damaged benches, mess, broken pavement, uncut grass, landfills, potholes, broken lights, or abandoned vehicle. Each city was evaluated individually to see what types of citizen reporting systems they have. The evaluation was held in July 2018. Mobile applications used in selected cities are described in more detail.

3. Results

The case study revealed that citizens in all regional capitals have some possibility how to report non-emergency incidents apart from the phone call. Figure 1 shows that the most frequent citizen reporting system is electronic form especially the mesh up of form and digital map. It is very convenient way how to report incident from table computer. However, the growth of smart phones popularity caused that at the second place are mobile applications. People can take a picture and easily send the report from the place of the incident. Seven cities out of thirteen support some form of mobile reporting. Only citizens in Ústí nad Labem have fewer options for reporting. They can only use e-mail or phone call. Moreover, it is not clear what types of incidents can be reported.

Figure 1: Frequency of use of citizen reporting systems in selected cities



Source: own processing

In table 1 are depicted particular citizen reporting systems for each city with the source of information. As the mobile applications are now very popular, we will focus our attention on this type and describe them in more detail. Three cities use the application InCity developed by Intelis. This universal mobile application provides the environment for sharing of municipal information. Cities, which are involved, can publish information from local government, useful information about accommodation, cultural events, restaurants, or traffic. Moreover, cities can choose the possibility of active citizen reporting. Hradec Králové, Karlovy Vary, and Zlín have chosen this option, whereas Liberec, Olomouc, Pardubice, and Ústí nad Labem only use InCity application to publish information but not for reporting. Other cities do not use InCity at all. Citizens using this application can send new report or see their own reports. However, InCity web pages do not publish sent reports and their status to inform citizens what incidents have already been reported and solved.

Second mobile application is DejTip, which is mobile application operated by third party, related to a wider area than the city, and specialized on reporting. Pardubice, České Budějovice, and some Prague districts use this mobile application, which allow users to take a picture, select one of the categories and add a comment. The server then locates a tip to the appropriate municipality based on the position of the GPS phone, completes the report of the nearest address, and passes it to the appropriate municipality. The municipality participating in the program receives an email twice per a day or it can have admin interface for sorting messages. DejTip web pages shows the map with the content of reports and their status.

Table 1: Citizen reporting systems used in evaluated cities

City	Incident	Citizen reporting system	Sources
Brno	All non-emergencies	GeoWeb	https://lesweb.brno.cz/hlaseni-zavad
České Budějovice	All non-emergencies	Dej Tip – mobile app	https://www.tkpgeo.cz/dejtip/cb/
		El. form	http://www.c-budejovice.cz/hlaseni-zavad
Hradec Králové	Street lights	El. form	https://www.tshk.cz/cs/sluzby/formulare/hlaseni-zavady-verejneho-osvetleni
	All non-emergencies	Mobile app	InCity
Jihlava	All non-emergencies	El. form	http://zavady.jihlava.cz/obcan.php
Karlovy Vary	Street lights	El. form	https://kv.verejneosvetleni.cz/
	Other non-emergencies	El. form	https://mmkv.cz/cs/zavady-nedostatky
	All non-emergencies	Mobile app	InCity
Liberec	All non-emergencies	GeoWeb	http://marushkapub.liberec.cz/default.aspx?themeid=8
Olomouc	All non-emergencies	El. form	https://www.tsmo.cz/hlaseni-zavad/
Ostrava	All non-emergencies	El. form	https://cistaova.ostrava.cz/
Pardubice	All non-emergencies	Dej Tip – mobile app	https://www.pardubice.eu/dejtip/dej-tip/
		Dej Tip – el. form	http://dejtip.eu/form/(S(oflaqq1sopeo0bezchj1v2p))/default.aspx?localityCode=jhpa32
Plzeň	All non-emergencies	GeoWeb and mobile app	http://www.plznito.cz/map
Praha	All non-emergencies	Mobile app	https://www.mojepraha.eu
	All non-emergencies	El. form	https://www.tsk-praha.cz/wps/portal/root/hlaseni-poruch-a-zavad
Ústí nad Labem	Not obvious	E-mail	http://www.msul.cz/rub-cerne-na-bilem
Zlín	Street lights, traffic lights, waste containers	El. form	http://www.tszlin.cz/
	All non-emergencies	Mobile app	InCity

Source: own processing

Prague and Plzeň have their own municipal mobile application. Plzeň has GeoWeb Plznito and mobile application Plzeň občan, which is municipal application with a lot of information from local government and the reporting module. Both ways, mobile app and GeoWeb can be used to see the status of reported incidents or to report new one. Prague also has its own mobile application Moje Praha. The goal of the application is to make it easier for all citizens

to find their way around the city and to report all non-emergency incidents. Mobile application does not provide status information about reported incidents.

4. Discussion and conclusion

Presented case study revealed that even if all cities offer the option to report non-emergencies by phone or e-mail, most of them also use some tool to get information in more structured form. The most frequent form of citizen reporting system among regional capitals is electronic form with geolocation followed by mobile applications. Moreover, many cities offer more than one channel for reporting non-emergencies.

Mobile applications operated by third party are very popular whether they are specialized on reporting or not. Universal mobile application InCity proved to be very popular for reporting non-emergencies even if this is only one feature of this application. On the other side, application DejTip, which is specialized on reporting is also popular. Not all evaluated cities have decided to use application operated by third party. Some cities use their own solution for reporting, especially if this is integrated in municipal application.

The length of the paper did not allow for detailed study of social networks, although some authors suggest that this source has very high potential value for reporting of incidents (Hughes & Palen, 2009; Toriumi et al, 2013; Gao et al, 2014; Crooks et al, 2013; Nik-Bakht & El-Diraby, 2016).

Acknowledgment

The paper has been completed with the kind support of SGS_2018_19 project of Faculty of economics and Administration, University of Pardubice.

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