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Engaging Users for Participating in a European Data Collection Campaign with Smartphones

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ABSTRACT

Researchers worldwide require valuable data to confirm and validate their models or theories. Obtaining such data, especially concerning people's behaviour, is very difficult. Although ICT technologies can facilitate the data collection process, it is necessary to consider the right promotional and communication tools to ensure the required sample size. The paper provides evidence on users' engagement during the European data collection campaign (H2020 MoTiV project) using the Woorti mobile application. The results show that using the mobile application to collect data does not automatically attract and engage citizens. This brings several challenges to be addressed during the data collection campaign. The study found that electronic media are not always the most effective channels to attract users to research. Direct addressing and outreach events seem to be more effective for this purpose. This case study also shows that although incentives motivate people to participate in data collection, the most crucial factor in their participation is contributing to the research.

KEYWORDS

Citizens' Engagement, Data Collection, E-Planning, Mobile Application, Promotion, Promotional Materials, Research, Sample, Social Networks, Transport

INTRODUCTION

Modern democratic society uses various tools to address the challenges of everyday life, also with the help of citizens' engagement in the planning process (Day, 1997). Whether at the urban or national level, involving citizens in planning processes has been considered crucial for decades (Chassin et al., 2022). State or local authorities require to obtain feedback from citizens on the current state of public services, planned changes, and policy measures, which help to make policies more transparent and effective (Tosh, 2014). Such citizens' involvement can shift from providing information to the co-creation processes, which leads to designing and implementing better public services (Torfing & Siebers,2018; Siebers et al.,2019). Nowadays, the citizens have many options on how to participate or engage. Over the last decade, there has been evidence of an enormous increase in the usage of digital technology and tools in cities and citizens' agendas (Figueiredo et al., 2016). Through Information and Communication Technologies (ICT), public bodies, research institutions, and other organisations

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obtain data but also give a voice to citizens to decide about important issues related to their lives, e.g. to reduce their dissatisfaction with public services (Pathmanathan & Poulier,2017; Shahid,2021). Several authors pointed out the use of citizens' applications focusing on various civic problems and engaging citizens in some steps of e-planning (Desouza & Bhagwatwar,2012). Currently, these applications are becoming part of the Smart City concept (Simonofski,2021).

One of the key areas in which data and information obtained from the population are essential inputs in planning is transport. In this area, various types of applications (web, mobile) have been used in recent years to collect data as well. These applications are mainly used to obtain data on the use of transport modes, the improvement of transport systems or the introduction of new ones (Inacolo,2019). However, the use of this type of data collection tool does not ensure the required sample size. Nevertheless, in this case, it is possible to gather data using a mobile application as a product and use the available marketing tools to promote it (Prelipciean,2018) and increase people's interest in participating in research. Therefore, this article seeks to find an answer to whether the use of marketing tools such as social media, online advertising, event marketing, etc. can increase interest in participating in the data collection process implemented using a mobile application.

The article brings new insights into promoting a new type of research mobility survey that combines elements of traditional travel surveys (paper surveys, face-to-face interviews, computer or phone interviews) with automatic data logs gathered from a smartphone with a personal evaluation of personal travel time from each user. Users were asked to evaluate their travel time from the perspective of the worthwhileness of their travel time, activities performed during their trips and positive and negative factors influencing their perception of travel time while all trip characteristics (travel mode, distance, time, etc.) were recorded automatically. That represents the main difference between surveys and apps, which are just based on tracking and tracing (Harrison,2020). In the article, various promotion channels and approaches to reach potential participants are compared in terms of their effectiveness in bringing active users to the project's data collection. In addition, the findings presented in this paper can be used in e-planning or future activities and research which depend on citizens' engagement.

This article is based on data and experience gained during the EU Horizon 2020 project called MoTiV (Mobility and Time Value). The MoTiV project focused on evaluating the value of travel time from the perspective of a single individual. In this case, the value of travel time represents a subjective evaluation of travel based on the passenger's preferred criteria; for example, a car driver can consider the time spent in congestion as wasted time, while a passenger on a train as productive, because of working or doing personal tasks.

The paper has the following structure. The part Background provides the review of current literature that deals with the problem of travel survey methods and the description of various communication channels and their potential to address transport problem-solving. The part Methodology and concept describes the research methods and concept of the data collection campaign (DCC). The part Results provides insight into the DCCs implemented in the analysed countries and their comparison. The Discussion section summarizes the main findings and compares them with previous research

BACKGROUND

Respondents' participation in a survey is an essential part of the research. The right choice of a survey method is a critical element of research success because it also significantly affects the interest in respondents' participation in the survey and obtained data. However, the respondents' interest can, to some extent, be influenced by correctly chosen marketing tools, which inform about the research and the possibilities of involvement. Therefore, the literature review focuses first on travel survey methods used in transport research and then on marketing and promotional tools used to advertise surveys and reach out to respondents.

Studies related to the types of travel survey methods mostly describe the modal split results (Silvano et al.,2020; Maruyama & Fukahori,2020). Their fundamental goal is to obtain a relevant sample, but a sufficient sample of respondents is one of the most common problems of transport research (White et al.,2008). It is essential to find ways to address research with potential participants (Wilcox, 2012). Historically, the data describing travel behaviour has been mostly collected through face-to-face interviews known as PAPI (paper and pencil interview), CAPI (computer-assisted personal interviewing), CATI (computer-assisted telephone interviewing) or CAWI (computer-assisted web interview) (Kagerbauer et al.,2013). In recent years, the high penetration of smartphones has led to the collection of detailed travel behaviour data through mobile applications (Assemi et al.,2018; Gadzinski,2018; Rasouli & Timmermans, 2014). One of the smartphone advantages is automatic data recording (Safi,2019; Greaves et al.,2015; Sato, Maruyama,2019), while they also represent a promising tool for longitudinal research (Udtha et al.,2015). Current smartphones are equipped with sensors allowing the tracking of movement (Korpilo 2017, Piras, 2018), which can be used in various research areas, for example, related to the pricing strategies during traffic peak and peak off (Adnan,2020), refugees topic (Keusch,2021), health (Dorsey,2017, NG,2019), climate change (De Crescenzo,2020), etc.

Another critical point is the promotion of research conducted through various communication channels, for instance, social media, due to the continuous growth of the smartphone market (Tokarcikova & Kucharcikova,2015). Currently, social media are used as the primary communication tools, but only for specific age groups (Chan et al.,2020). Some age groups (e.g. seniors) do not use social media as a primary communication tool compared to teenagers. The statistics showed (Statista,2021a; Statista 2021b) that more than 60% of social media users are 13 to 34 years old. Young people are the ones who mostly trust the content on social networks (Warner-Søderholm et al., 2018). Therefore, when using social media for research promotion, it is necessary to consider the age of users, users' expectations and the focus of social media (Kim and Kim,2018). Social networks such as Facebook are more focused on socialization and recognition of users, while microblogs such as Twitter present specific content for a specific auditorium (Kim and Kim,2018, Orellana-Rodriguez and Keane,2018; Chen, Chang, 2017). Twitter is used very often as a promotional channel for politicians (Kruikemeier, 2014), crowdsourcing (Kim et al.,2018) or as a channel for education (Hai Chu et al.,2018). However, the usage popularity varies from country to country (Statista,2021c). Another traditional form of research promotion is print advertising but relevant for the age group 40 and over. (Maruyama et al.,2015).

To improve the response rate, various forms of incentives are also being applied (Qudratullah&Maruyama,2019). This helps to keep respondents motivated throughout the data collection period (Comendador&López-Lambas,2016). Some of them are monetary, cash or non-monetary prize lotteries, charity donations, gadgets or altruistic text appeal interventions (Pederson&Nielsen,2014; Goritz&Luthe, 2013). However, during the process of selecting incentives, it is necessary to consider the required sample structure. Some incentives may be more enjoyable for younger than elderly participants or for women than men (Qudratullah&Maruyama,2019).

However, certainly, there is still room to capture much more data from travel surveys. There is insufficient literature describing the respondents' attraction in case of comparison of the methods used to promote surveys or a detailed description of marketing campaigns aimed at travel surveys. The lack of experience in comparing various promotion and engagement channels used to promote travel surveys can be observed. Current studies in the field of smartphone-based travel surveys summarise the results of such data collection (Patterson&Fitzsimmons,2016; Wang,2018) or present the high response level in a particular city with the role of incentives. However, there is insufficient literature covering the international comparison of citizen engagement with a smartphone app in a multicountry travel research project. Therefore, this paper aims to contribute to theory and practice in this area and provide an overview of the effectiveness of the chosen communication tools to support data collection in travel behaviour research in Europe.

METHODOLOGY AND CONCEPT

The research focuses on various engagement model frameworks. Balestrini (2017) proposed the extension of the so-called Participatory Action Research (PAR) principles (plan, act, observe, reflect) to the identification, framing, design, deployment, orchestration, and outcome. However, this model was more suitable for community problem-solving. JRC published the Guide on citizens' engagement in science and policy-making (Figueiredo&Nascimento,2016). The Guide only applies to projects that already use the citizens' engagement methods, and it contains only the basic recommendations for working with citizens. The report from PE 2020 project summarised the success criteria from empirical cases in public engagement and pointed to participatory performance as a part of the key concept. However, there is a lack of evidence on dealing with specific tools to attract a higher response rate with ICT. Therefore, in this article, qualitative research is applied; specifically, a case study focused on the comparative and empirical analysis of the promotion and communication channels among the project partners during the transport data collection campaign.

The research aims to address the following hypotheses:

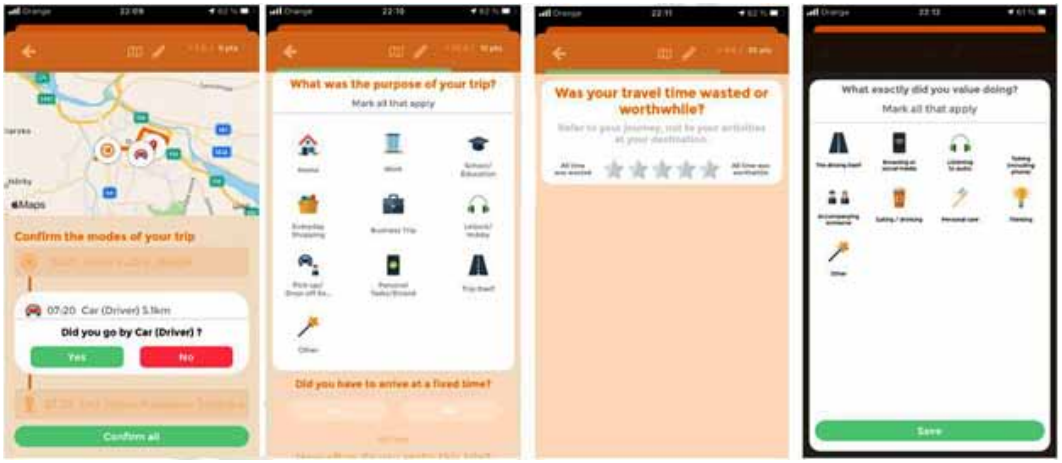
H1. The technological tool, the smartphone data collection, automatically attracts and engages citizens.
H2. Digital or electronic media are the most effective channels to attract citizen engagement.
H3. The incentives have a positive impact on citizens' engagement in research.

To confirm the hypotheses, the approaches of DCCs managers in the different countries were analysed and then compared with the achieved numbers of respondents and their feedback, revealing the motive for participating in the research. Based on this, recommendations for planning future DCC were drawn. All data and information used in this research come from the project MoTiV. Data shows the number of participants taking part in the data collection campaign. The number of participants is analysed in terms of the results of a survey conducted after the end of the data collection campaign. This survey contains information about respondents' motivation to participate in the research and the way they learned about the mobile application and the research.

DATA COLLECTION AND MOBILE APPLICATION

The aim of the data collection campaign was to obtain data from the largest possible number of users of the mobile application Woorti developed within the project consortium. The application was a tool for collecting data on the daily travel of users. It was available for both Android and iOS users. After downloading and opening it, users were asked to enter their socio-demographic characteristics (age, gender, country of residence) and modal preferences. The application then started automatically recording users' trips. At the end of the trip, the application asked the user to evaluate at least one of the trip legs. Users should confirm the detected mode of transport and provide additional information related to the purpose of the trip, the worthwhileness of travel time, experience factors, and activities performed during the trip (Figure 1). Worthwhile travel time was within the MoTiV project understood as a travel time which can be pleasant, meaningful and perceived value from travelling can be characterised by three types: enjoyment, productivity and fitness (Cornet et al., 2021).

Figure 1. Screens from the Woorti application



Although several citizens' engagement research projects (e.g. Elan, Transform, Matchup project) have been carried out, the project MoTiV was slightly different. The data collection was based on citizens' engagement, and it overcame the traditional approach based on tracking (see Table 1).

Table 1. Comparison of basic features between traditional and MoTiV survey

Traditional survey	MoTiV survey
Period: 1 day or multiple days	Period: At least 14 days up to several months
Personal data	Personal data
Socio-economic data	Socio-economic data
Trip purpose	Trip purpose
Travel mode (detected or manual input)	Travel mode (detected or manual input)
	Evaluation of trip leg (Fitness, Enjoyment, Productivity)
	Activity during travel
	Experience factors
	Travel statistics

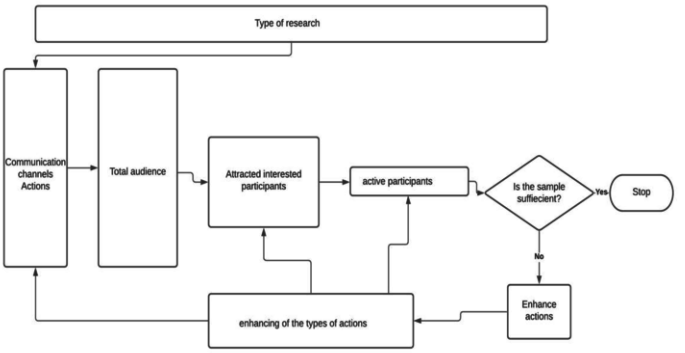
The main difference between the traditional tracking app and the Woorti app is that the traditional tracking app just automatically tracks users' movements. The Woorti app consists of the higher demand and need for personal verification and evaluation of the trip and the requirement to give feedback based on the experience factors. That means the traditional sports or tracking apps record the trips and location automatically, but there are no data about the trip purpose, valuation of trips, etc. For that reason, the Woorti app required to give feedback on each recorded trip from the perspective of the travel time worthwhileness. That means the travellers had to submit if the trip's travel time was worthwhile or wasted (e.g. sitting in the car in a traffic jam).

The Research Sample Size Requirement and Engagement Model

The project board set a goal to attract at least 500 respondents in each of the 10 European countries in the project consortium. Therefore, the project's goal was to recruit at least 5,000 users of the Woorti application who would use the app for at least 14 days. Within the project, the Citizen's Engagement Framework (CEF) was developed to manage the app's promotion and attract potential users in an active participation process aiming at data collection. CEF contained a summary of communication tools which could be used in data collection such as project website, e-mail marketing (project newsletter), demo video, app store optimisation, social networks, Google AdWords, press releases, interviews with local newspapers, flyers and leaflets, celebrity endorsements and personal recommendation. All these tools were described in CEF to help campaign managers to decide what tools are the most suitable for reaching the sample in their country. The campaign managers also had to prepare a national sampling report focused on addressing users. Every report contained the required structure of the sample based on gender and age (calculated based on the structure of the country population), expected numbers of users addressed by each selected tool, and incentives used in the Data Collection Campaign (DCC). In addition, reports also contained a list of stakeholders with their expected roles in DCC.

The goal of the DCC was to reach potential users aged 18 and more, motivate them to download the application and then keep them active for 14 days, which was the biggest challenge. The project partners constantly monitored the number of active users. If the number of active users did not meet the expected goals, the type of actions and communication channels to achieve the required sample of participants involved needed to be changed (see Figure 2).

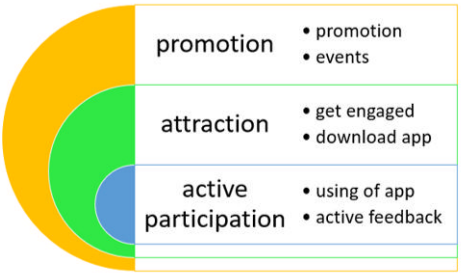
Figure 2. The process flow in the citizens engagement model



The general campaign with all promotion activities served to attract potential users. The whole process of engagement has been divided into several steps, see Figure 3:

- Promotion – It represents the first information that goes to the users via various promotion channels.
- Attraction - In case the users were interested in participating in the project, they downloaded the app. To attract potential users to download the app, the incentives scheme has been designed.
- Active participation - The final engagement consists of the active users for a period of 14 days.

Figure 3. The role of promotion attraction and active participation in the data collection campaign



Management of Data Collection Campaign

The project consortium consisted of 7 organisations (academic and research organisations, a technology company, a start-up and an NGO focused on fostering the usage of cycling) from 6 countries (Belgium, Finland, Portugal, Slovakia, Spain and Switzerland). These organisations were involved in implementing project activities. In addition to the partners, the third link parties, and organisations from other five countries (Croatia, Italy, France, Norway and Romania) supporting the project also took part in this activity. In the end, the overall survey was conducted in all mentioned countries except Romania. Partner from Romania decided to stop its participation in the project, realising that it would not be able to reach the required sample.

As already described, CEF was developed regarding the promotion of data collection, but no common communication and promotion strategy was defined. The project partners and supporting organisations could decide what communication and promotion channels will use to achieve the required sample size. Some organisations have used mainly social networks to communicate with their target groups, others have organised events, cooperating with different stakeholders, etc. However, each partner or supporting organisation had to follow the prepared national sampling report. These reports were developed during the preparatory phase, in which also Woorti app was tested. Some of the partners, e.g. partners from Slovakia, decided to start engaging potential users already during this phase to reduce the potential risks of a low participant engagement rate and test how potential users react to the campaign.

After Woorti mobile application was launched, all partners and supporting organisations focused on the implementation of activities from the engagement plan. Progress in achieving the required sample was monitored weekly to respond flexibly to any problems associated with reaching users.

RESULTS

Preliminary Phase

The objective of the preliminary phase was to promote the MoTiV project as much as possible and facilitate data collection campaigns at a later stage of the project. During this phase, the focus was placed on the project promotion mainly via stakeholders and outreach events. The phase started in July 2018 and lasted until the official start of the DCC, in May 2019. Table 2 provides the statistics of registered users within the first week of the DCC, and it reflects the performance of campaign managers during the preliminary phase.

Table 2. The results from the MoTiV preliminary phase

MoTiV Preliminary phase	Active Users	Submitted Trips	Submitted Legs
Belgium	1	1	1
Croatia	1	1	1
Finland	15	83	173
France	0	0	0
Italy	1	3	8
Norway	1	5	15
Portugal	6	32	63
Slovakia	82	587	1378
Spain	2	5	6
Switzerland	0	0	0
Other countries	1	2	2
Total	110	719	1647

As shown in Table 2, the most active country in recruiting users during the preliminary phase was Slovakia, which focused on cooperation with stakeholders and the promotion of the project at outreach events. More than 40 different stakeholders (municipalities, schools, universities, transport providers, NGOs) were contacted. In this phase, the Slovak MoTiV team collected e-mail addresses of interested users who were contacted after the release of the app. The participation in such outreach events brought more than 500 users with e-mail contacts interested in participating in the DCC. Only a few users (120 persons) have been attracted through Facebook and Instagram. Twitter was not used in Slovakia due to limited usage and popularity (2,59%) in comparison with Facebook (81%) (Statcounter,2019). Events were the most effective communication channels attracting the most users. During these events, project team presented the application and research face to face and ask respondents to test the application and provide feedback. In the case of Slovakia, 82 persons tested the app (see Table 3).

Table 3. The comparison between general audience and attracted users

Communications channels	General audience	Attracted user
Flyers, leaflets	1000	12
Facebook, Instagram	120	3
Promotion events (outdoor events)	1200	52
Conferences, lectures	200	15
Total	***3320***	***82***

The effort spent during the preliminary phase in Slovakia promoted the project itself and prepared an optimal starting position for the DCC. On the other hand, other countries participating in DCC postponed the promotion of the MoTiV project during the preliminary phase and focused mainly on the promotion of the Woorti app during the DCC, when the application was released.

The Official Data Collection Campaign

Considering the complexity and scope of the DCC, the active approach with strong involvement of stakeholders supported by using different promotional channels was chosen for recruitment and engagement of users of smartphone applications.

Each project partner and linked third partners were responsible for promoting national collection campaigns, and they were required to prepare their own national DCC plan. The official campaign ran from May to December 2019. Finally, the campaign attracted 3,011 active users during the period. The MoTiV campaign lasted for seven months in 2019, and it attracted more than 5,200 users who registered in the campaign and downloaded the Woorti mobile app (Table 4).

Table 4 provides an overview of users' participation and engagement in 10 countries.

Table 4. Key performance indicators of the MoTiV DCC

Country	N.º of persons registered in the campaigns	N.º of active users	N.º users with 14 days of trips	Ratio active users/persons registered
Belgium	605	295	65	49%
Croatia	128	62	9	48%
Finland	494	264	25	53%
France	539	278	33	52%
Italy	533	261	38	49,0
Norway	652	395	82	61%
Portugal	525	301	69	57%
Slovakia	858	564	191	66%
Spain	654	445	117	68%
Switzerland	75	51	16	68%
Total	**5,256**	**3,011**	**652**	**57%**

Considering countries, most of the active users were enrolled in Slovakia. The partner from Slovakia focused mainly on reaching out to university students, teachers and researchers. Users who installed the app and validated at least one trip per day during the 14 days were rewarded with a package of gift items such as a power bank, pen, notebook, key chain. In addition, they were included in a competition in which they could win an e-scooter. Thanks to the incentives, the number of active users increased by 200. Cooperation with stakeholders was also an important factor in DCC. Stakeholders in Slovakia had various roles in DCC: some of them were only promoting the campaign, others played an active role mainly focusing on recruitment of participants, such as promoting the app on LCD monitors on buses and trolleybuses, or they focused on active recruitment of users in their outreach events. Besides, the Slovak team also participated in several outreach events in Slovakia. These events allowed the project team to interact with the public closely and explain the functionality and rationale behind the app and data collection, which led to higher engagement of new users.

The second country with the most active users was Spain. Partner from Spain decided to use mainly its website, internal and external newsletter, social media (Twitter, LinkedIn, YouTube and Facebook) and its media database to promote the project and application by sending a press release to local and regional newspapers. In addition, they also addressed stakeholders such as the regional transport department, public transport operators in the region, municipality, national train company,

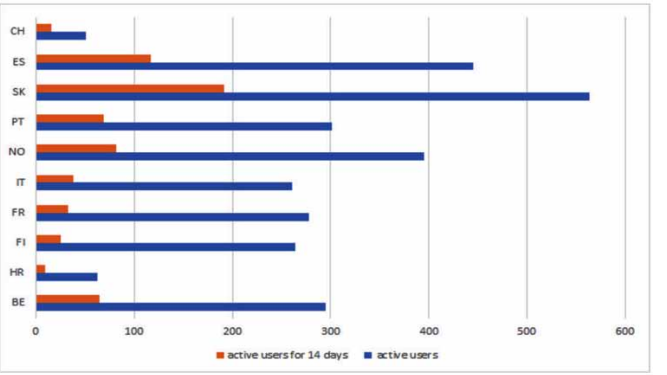
private transport companies and others. Some stakeholders were actively involved in DCC, but most of the respondents mainly promoted the campaign on their social networks and websites.

On the contrary, the fewest users were acquired in Switzerland and Croatia. Partner from Switzerland used in national DCC for promotion only social media (Facebook, Twitter), e-mail marketing and newsletter. The Croatian organisation also relied mainly on the use of these tools but also supplemented them with promotion by a few stakeholders (tram company, bike-sharing company, environmental association).

Problems with reaching the required sample in some countries also occurred because the organisations that implemented the DCC had a shortage of manpower to participate in the campaign.

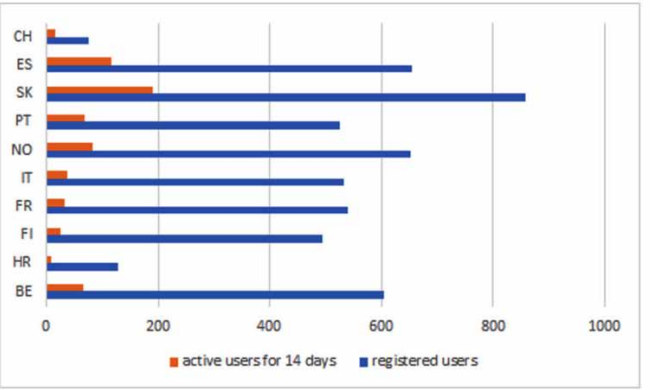
The biggest challenge at DCC was to get users to use the app for at least 14 days. On average, the number of active users (people who downloaded the app and recorded at least one trip) corresponds to 57,09% of total registered users (Figure 4).

Figure 4. The comparison between the number of active users and active users for 14 days



It can be also seen, that share of the respondents who used application 14 and more days was very low in comparison to the total active users, representing just 20,77%. Of course, the rate is even lower, when comparing the total registered users and 14 days active users (see Figure 5).

Figure 5. The comparison between the registered users and active users for 14 days



The results show that local campaigns have been led differently across countries, but local managers have used a set of mutual communication tools to spread the campaign among their citizens. Table 5 outlines the effectiveness of communication channels used for promoting the Woorti app (the data are obtained from the questionnaire on Woorti's feedback and represent a sample of 15% of all participants).

Although the penetration of smartphone use in campaigning countries was relatively high, it did not automatically attract citizens to participate, which means that hypothesis 1 was not confirmed. The data collection application should, therefore, in addition to recording the data, also offer additional value to its users in order to motivate them to take part in the research. Another reason may be that since the application was new, people could consider it untrusted. This could represent a barrier to participation in the survey.

This is probably related to the topics of the technology acceptance model (Schmitz,2016). The obstacles also represented the science and research attributes of the application, which were not understandable to the public. In this case, face-to-face promotion played a key role in helping to clarify the issues surrounding the campaign. This is also confirmed by the number of outdoor events that enabled to attract users. Based on these results, digital or electronic media are not the most effective channels to attract citizens' engagement, which means that hypothesis 2 was not confirmed.

Table 5. Source of information about DCC in project countries

Country	From a relative/ friend/ co-worker	E-mailing	Social media, newspaper, magazine	Public event	On bus or on-street adver.	Other	Total
Belgium	8	15	17	0	1	10	51
Croatia	10	4	28	3	0	2	47
Finland	14	2	38	1	0	3	58
France	10	4	25	4	0	11	54
Italy	11	3	14	7	0	18	53
Norway	16	3	98	4	0	3	124
Portugal	146	0	6	8	4	1	165
Slovakia	31	7	25	17	5	1	86
Spain	45	7	15	5	0	4	76
Switzerland	1	0	0	0	0	0	1
Total	292	45	266	49	10	53	715
%	41%	6%	37%	7%	1%	7%	100%

In some countries, such as Portugal or Spain, the most important source was the recommendation from a co-worker friend or a relative. On the other hand, in Norway, social media or prints were the main sources.

The Role of Incentives

The rewards and incentives schemes varied from country to country. For instance, the Slovak team tested the role of incentives by distributing promotional packages and power banks for users who downloaded and started to use the app. In addition to increasing people's motivation, this incentive

also eliminated battery consumption's most significant shortcoming in using the application. Overall, the rewards accounted for nearly one-third of the main motivations to participate in the project.

Based on the number of respondents and the use of incentives in the DCC, it can be stated that the use of incentives has a positive effect on increasing the number of respondents in the research, which means that hypothesis 3 is confirmed. Different types of incentives were an exciting benefit for users who were able to get involved in the campaign. This is probably one of the essential attributes that cannot be overlooked when planning a scientific research project data collection. It is also important what type of incentive (Haas,2020; Singer,2008; Cappa,2018) can reach a potential participant.

Although rewards helped increase the number of participants in data collection, as shown in table 6, contribution to the research was the most indicated factor motivating people to use Woorti and, consequently, to participate in the project. This motive may hide the fact that the project partners addressed their family and friends, and therefore they wanted to contribute to the research.

The nature of the motivation that triggered people's interest in using the app is not homogeneous and can vary among different socio-demographic variables. The following tables (Tab.6a,6b) provide an overview of people's interest in using the app broken down according to country and age. The results show that rewards played a role mainly for youngsters, and in some countries, they represented an important share (40%) of participants (Norway, Portugal, Slovakia). The seniors were expected to have a lower involvement rate due to IT skills as well as in handling technical problems. Some of the project partners (e.g. Slovakia) tried to eliminate this problem by a special workshop, in which they helped to install the application and explain how to use it.

Table 6. (a) Motivation to participate in the DCC according to country

Country	Rewards	Personal curiosity	Contribution to the research
Belgium	20%	2%	78%
Croatia	8%	3%	89%
Finland	27%	0%	73%
France	2%	2%	96%
Italy	2%	96%	96%
Norway	42%	6%	52%
Portugal	44%	14%	42%
Slovakia	38%	12%	50%

Table 6. (b) Motivation to participate in the DCC according to age

Age	Rewards	Personal curiosity	Contribution to the research
16-19	46%	20%	34%
20-24	46%	13%	41%
25-29	30%	9%	61%
30-39	31%	7%	63%
40-49	25%	6%	68%
50-64	22%	4%	74%
65-74	26%	4%	70%

DISCUSSION

E-planning, as a current emerging trend, is facing problems that need to be addressed, especially attracting more people to digital platforms, solving problems with an insufficient number of participants, keeping their engagement and using of right communication channels to attract more participants. Some theories (Balestrini et al., 2018) use an approach where residents voluntarily and gladly participate in public affairs (e.g. health, public finances, environmental challenges, etc.). On the contrary, other areas are not so popular with volunteer engagement. These are especially areas not so well known to the general public, for example, various research projects whose objectives are not so clear to ordinary people. In this case, to increase the required sample, it is necessary to implement support mechanisms such as incentives (Haas et al., 2020). Therefore, the major aspect of a successful data collection campaign is related to the research context, which is in line with a study by Huang et al. (2012). That means that with some of the research topics, citizens are more familiar, with some less. The results proved that in the case of citizens' engagement in the scientific project, there should be a clear and meaningful reason for the engagement to reduce just "engagement in the engagement", as is described in Powell (2008). Another theory discusses the role of epistemic beliefs in engaging citizens in scientific projects (Choung,2020), but the results could differ from the expectations. Another aspect shows the importance of how citizens are invited and engaged in DCC. The empirical evidence of our case study pointed to different approaches to promoting and using communication channels. Especially in the case of Slovakia, the great importance of social networks to attract new users, such as in other countries (e.g. Norway), has not been confirmed. One of the key communication channels was events where the application or DCC itself could be presented face-to-face, or it was possible to show how it works. Another finding is related to the fact that it is not possible to compare the promotion of a research project with the business service or product in the real market due to limited sources, either personal or financial. But, the findings from the DCC can contribute, for instance, to research methods of the citizen's science (Martin, 2017), where the level of engagement rate depends on a great degree on the type, goal and meaningful elements of the research. That means the prediction of the app usage or citizens' engagement is often theoretical. This is in line with the study of Huang (2012) that tried to predict app usage, but this is very limited to each specific app's features.

The insights related to the DCC are summarised in the following groups:

Data Collection Organisation and Management

It is important not to underestimate the tasks that may arise during the implementation and try to eliminate their occurrence. As a major shortcoming, we see that if partners do not want to solve the problem, it can become an obstacle to the continuation of the project or research. In certain cases, there was a lack of communication between partners and additional partners who were not informed about all circumstances and requirements for data collection. The results differ as each partner organised and managed their own country DCC by themselves.

Handling the Sample Size

The problem of obtaining the required research sample was also caused by the inability to achieve the basic selection indicators according to the survey's area. Countries that implemented their survey on a larger sample of the territory had a greater involvement of the population than in countries that promoted the survey only on a small specific area (e. g. university campus). But the problem remains, in fact, to keep the users active. Once they have downloaded the app, they should actively use the app for a specific time. Also, evidence confirmed the effect of incentives to enlarge the required sample in line with Haas et al. (2020) and Maruyama (2015). But in some countries, the citizens simply weren't interested in the app.

Technical Problems with the Application

The application was developed for Android and IOS, but some problems occurred with IOS or with certain types of smartphones. Although technical support was available, it was rather limited due to the project's staff's capacity to solve problems in the multilanguage app. This is a disadvantage of research projects that are implemented on an international scale because they cannot compete with private applications. This aspect is overlooked in the study of Desouza and Bhagwatwar (2012), citing only the positives of digital tools to engage citizens, but it can be a significant factor in the campaign's success.

Underestimation Of the Preparation of Communication and Dissemination Channels

Some communication channels designed to attract respondents indicated a low level of active user involvement. Relying only on impersonal social media or e-mail campaigns did not effectively involve users in the data collection campaign. This means it should be mixed with face-to-face events that could attract potential users. The evidence from the campaign also proved that there is no common successful approach for each country participating in the data collection campaign. Therefore, campaign managers should carefully choose the right communication channels (Ignaccolo, et al., 2019, Patterson & Fitzsimmons, 2016), even at the cost of not always finding the most appropriate one. Sometimes it is necessary to test these communication channels.

Demanding Application Usage

One of the aspects that discouraged users from using the application was the high need for manual confirmation and evaluation of trips. This is one of the aspects that contributors of a research project need to consider before the process of data collection (Gadzinski, 2018). The goal should be to get all the required data but with the least effort for the users of the application.

Adapting Approaching of Respondents Based on Age

A study of Silvano et al. (2020) warns of the potential problems that some age groups could participate more likely than others. It was also confirmed by this study. While for middle-aged users, the application was not a problem, for older people it was a problem mainly due to a lack of IT skills or inappropriate mobile phone. However, there was also a problem with young people. They did not consider the application exciting and bringing them additional value. Therefore, when collecting data using a mobile application, it is necessary to focus on making the application attractive to its users, bringing them added value. When promoting such data collection, it is also necessary to correctly explain the purpose of data collection and adapt the explanation style according to age groups.

Resources for Data Collection Campaign

One of the critical factors influencing the success of the data collection campaign is cost and budget. This factor certainly played a role in MoTiV project as the planned budget had to be adhered to. When planning further projects involving data collection, a part of the budget needs to be set aside for this activity, whether for promotional materials, organising events, or purchasing incentives. (Comendador, López-Lambas, 2016). In addition, financial resources together with human resources must also be taken into account, as the project confirmed that some partners had limited personnel resources. That is in line with the results of the Powel study (2019), pointing to the potential threat to sustaining such engagement.

Concluding the above facts, the success in gathering a sufficient sample for research is highly dependent on various factors such as good planning, campaign steering during the process of data collection, be prepared for the potential problems with adequate solutions. It can be seen, that despite one project consortium, the results are really different because the partners approached the involvement

of the population in different ways. Underestimation of these aspects has naturally led to the failure to meet the expected goals.

CONCLUSION

Scientific and research projects, which are based on obtaining data from the population through technological tools, have several obstacles preventing the population's involvement in research. While in traditional face-to-face research, it is easier to describe the issues or explain in more detail what is needed, in the case of using tool such as a smartphone, the user is alone to complete and actively participate.

Obstacles or problems that reduce user engagement may be of a technical nature or ability to use modern technology. Although several communication channels and tools can be used to attract users to participate in a survey, their effectiveness varies. In terms of available data, it is possible to assess that personal (face-to-face) recommendation and explanation is still more valuable than just digital information or promotion. This article describes the process of the engaging population in the scientific project MoTiV. The DCC was based on the use of a mobile phone, which then collected input from users. The paper describes the design and involvement plan of the population and the result achieved during the project. Even though the objectives to reach an adequate sample size were only partially achieved, there is an added value of contribution to research in the areas of promotion, engagement and communication channels effectiveness linked to factors that affect this type of research. This can help designers of similar surveys to better prepare citizens'/stakeholders' engagement and not underestimate certain important factors.

From a scientific/research perspective, not all potential users (who could be involved in data collection) will automatically understand the project objectives. Then there is the technological aspect of participation or engagement. Although smartphones are being used much more than a few decades ago, a great emphasis is still placed on a particular type of applications that the user will install and how they will use them. In the case of unattractive scientific applications, it is up to the project management to prepare the promotion so that it can attract the interest of enough people. In certain cases, it poses problems that may be underestimating or overestimating the communication channels that are used, but they are not as important for some purposes as traditional face-to-face conversations, where the problem can be clarified much more quickly.

Therefore, this paper presents insights from the MoTiV DCC case study on how the innovative data collection process can be useful in potential future e-planning or Smart city agenda usage. Nowadays, the Covid-19 pandemic opens a new perspective on how to use smartphone data for data collection (Li,2021), tracing (Garrett,2021), and the topic of privacy (Ribeiro-Navarrete,2021) or just to evaluate daily travel (Järv,2021).

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