

Assessing the Benefits of Open Government Data: The Case of Meu Congresso Nacional in Brazilian Elections 2014

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ABSTRACT

Open Government Data (OGD) and transparency has been recognized as having the potential to provide many benefits for the society at all, including governmental, scientific, commercial and political domains. However, much of the existing research discusses benefits on a high-level basis, and more empirical analysis is needed in order to analyze and assess the real impact of these initiatives. The objective of this paper is to analyze the benefits perceived by the general population of the use of applications based on OGD, especially the Meu Congresso Nacional, a website based on political OGD and broadly used by Brazilian citizens in the Brazilian elections in 2014. The analysis was based on a survey conducted with website visitors and concludes that, despite this kind of application not yet being popular, people consider them more useful than official government websites, able to help reduce corruption and even influence voting decisions.

Categories and Subject Descriptors

J.1 [Computer Applications]: Administrative Data Processing – Government.

General Terms

Measurement, Documentation, Experimentation, Human Factors.

Keywords

Open Government Data, E-Government, Transparency, Digital Society, Elections, Brazil.

1. INTRODUCTION

Since the 1950s [1][2][3], governments have agreed that transparency, “*the right to know*,” and Open Government Data

(OGD) being verified and used by the general population can lead to many benefits, such as increased accountability, citizen participation and collaboration. More recently, the movement resurfaced with the possibility of the using Web 2.0 to publish and consume OGD, and many possible benefits are broadly advertised, including governmental, scientific, commercial and political domains. The benefits can be the delivery of better public services and increasing government efficiency and effectiveness; use in scientific research [4]; the generation of commercial value and promoting more cooperation between government and the society, including a positive impact on the quality and effectiveness of political debate [5]; increased accountability [6], citizen participation, engagement and collaboration [7][8]; and the decrease of corruption [9][10].

The big investments made both by the governments of many countries and by wider society for the development of OGD initiatives make it necessary to evaluate them systematically in order to better understand and assess the various types of value they generate, as well as to identify the required improvements for increasing this value. However, so far, little has been done to analyze and prove the impact and accrued value of these initiatives [5]. As a consequence, some authors, such as Zuiderwijk [11], argue that an unrealistic picture may be painted of the potential of open data, which could result in unrealistic expectations by citizens, civil servants and other stakeholders.

Thus, many questions need more empirical support, such as (a) where do people search for information: on official governments’ websites, on traditional news channels, directly on search engines, in applications that use OGD or in any other information source? (b) Do people agree with the broadly used argument [12] that government should focus on providing reusable data rather than providing transparency portals? In other words, do people agree that independent websites based on OGD are better than official websites? (c) Are these websites based on OGD actually capable of influencing citizens’ decisions and behavior? (d) Finally, do people consider that OGD initiatives can actually help to decrease corruption?

Aiming to provide more empirical data to support the abovementioned questions about OGD, this paper performs a study based on an application based on Brazilian OGD, *Meu Congresso Nacional* (MCN — My National Congress). The application integrates data about all Brazilian federal politicians (Federal Deputies and Senators) and about all candidates in the Brazilian elections of 2014, and was widely used in the Brazilian elections of 2014. For the analysis, a survey was conducted with

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application users in order to obtain and analyze the benefits perceived by the general population by the use of information systems based on OGD in the context of MCN, 2014 federal elections.

The remainder of this paper is organized as follows: Section 2 presents the literature review and theoretical background about OGD, the Brazilian OGD scenario and related works; Section 3 presents the research approach including the planning, data collection and analysis methodology; Section 4 presents survey results and discussion, as well as a specific discussion about the study's validity; finally, Section 5 presents concluding remarks.

2. BACKGROUND

2.1 Open Government Data

The idea of open government dates back to the 1950s [1][2][3], the early years following World War II when the “the right to know” principle already pointed to many benefits of freeing government data. Currently, these benefits include delivering better public services and increasing government efficiency and effectiveness; use in scientific research and contributing critically to the development of the ‘e-Science’ paradigm [4]; the generation of commercial value, estimated as 140 billion Euros per year [13], including data reuse for developing new products and services [14]; and promoting more close cooperation among government agencies and the wider society, including a positive impact on the quality and effectiveness of political debate [5], the increase of accountability [6], citizen participation, engagement and collaboration [7][8], and the decrease of corruption [9][10].

On the other hand, little has been done to analyze and prove the impact and accrued value of these initiatives [5]. In fact, research has shown that the measurement of open data's impact and value is highly complex and that impact and value can only be measured over time [15]. Moreover, much of the existing research discusses benefits and barriers on a high level without providing much detailed insight in the underlying processes to create value. Thus, these claimed benefits of OGD have been challenged.

Davies [16] points out that “it is not yet clear if open data initiatives are truly delivering on their promises,” and Barry [17] challenge the conventional wisdom that opening data will result in transparency. In addition, Janssen [18] argues that more information does not necessarily result in better informed decisions, due to the fact that large amounts of data might result in a huge information overload and might not help to create any transparency. In addition, it is also difficult to find studies that analyze the value of OGD initiatives from the point of view of the most interested party, the citizens. As a consequence, Zuidervijk [11] argues that an unrealistic picture may be painted of the potential of open data, which could result in unrealistic expectations of citizens, civil servants and other stakeholders.

Thus, more empirical studies should be performed to support conclusions about the positive and negative effects of OGD.

2.2 Brazilian OGD

Brazil is one of the founding governments of the Open Government Partnership (OGP), launched in 2011. The partnership declares the ultimate goal of improving the quality of governance as well as the quality of services that citizens receive and the government's commitment to (i) increase the availability of information about governmental activities, (ii) support civic participation, (iii) implement the highest standards of professional

integrity throughout its administration and (iv) increase access to new technologies for openness and accountability [19].

The most notable results of Brazilian participation in OGP are the implementation of the Brazilian Access to Information Law in 2011, and the creation of the Brazilian OGD Portal, launched in 2012.

Following the federal initiative, government agencies from all government levels (federal, state and municipal) are creating their own OGD and publishing their data, such as the Federal Chamber of Deputies, Federal Senate, and cities such as São Paulo, Rio de Janeiro, Recife, and Belo Horizonte. Moreover, as a way to promote the innovative use of their open data and the creation of new services, civic hacker marathons (hackathons) and application contests are being financed by federal or municipal governments, such as the National Parliament Hackathon [20], São Paulo Hackdays [21], RioApps contest [22] in Rio de Janeiro and Cidadão Inteligente.rec contest [23] in Recife. In addition, there have also been some innovative initiatives, such as LabHacker [24], a hacker lab that operates inside the Federal Chamber of Deputies by its own initiative and is, apparently, the only one of its type in the world.

Despite these initiatives, Brazil follows the world scenario where more empirical studies should be performed to support conclusions about the positive and negative effects of OGD.

2.3 Meu Congresso Nacional Application

MCN is a website developed by the authors' research team to compete in the I Brazilian Parliament Hackaton, held in the Brazil Chamber of Deputies in November, 2013. Initially, the application focused on the transparency of all Brazilian Federal Parliamentarians, the 513 Federal Deputies, and the Republic's 81 Senators. It shows (a) identification data; (b) their frequency, (c) the commissions in which they participate or have participated, (d) laws and amendments to the constitution (very common in Brazil) proposed by them and (e) detailed data about the use of parliamentary quotas, that are additional expenses paid by the federal government to support parliamentary activity, constantly suspected of being opportunities for embezzlement.

In addition, in 2014 the website was reformulated to aggregate data about more than 27 thousand candidates for the Brazilian elections of 2014, including (a) identification data; (b) properties, with the list of all properties that the candidate declares to Electoral Court; (c) campaign donations, with the list of all campaign donations received by the candidate and his/her party, also constantly suspected of being opportunities for embezzlement and (d) votes, with data on the votes that each candidate received and whether he/she was elected. The 2014 elections were about five positions: President, Estate Governors, Senators of the Republic, Federal Deputies and State Deputies.

The website is based on OGD mainly from the Chamber of Deputies OGD portal, Federal Senate OGD portal and Superior Electoral Court OGD portal, in addition to other data sources, such as *Receita Federal* (the Brazilian Internal Revenue Service) and Google Maps API. More detailed information about MCN implementation can be found in [25].

MCN can be considered a successful application. The page-view rate was about 70,000 monthly page views between September and November, without market funding or professional advertising. It is important to notice that the higher rates continue even after the elections occurred on October 2014, with 52% of

accesses originating from organic search, 25% from social networks, 12% direct access and 9.7% from referral. The referral occurred mainly from the mass media press that recognized the website's utility, such as references in articles of the well-known BBC [26] and articles of Brazilian popular channels *UOL Eleições* [27] and *Exame* [28]. Moreover, 96% of website access was spread from Brazilian states, in a distribution very similar to country population distribution, as shown in Figure 1.

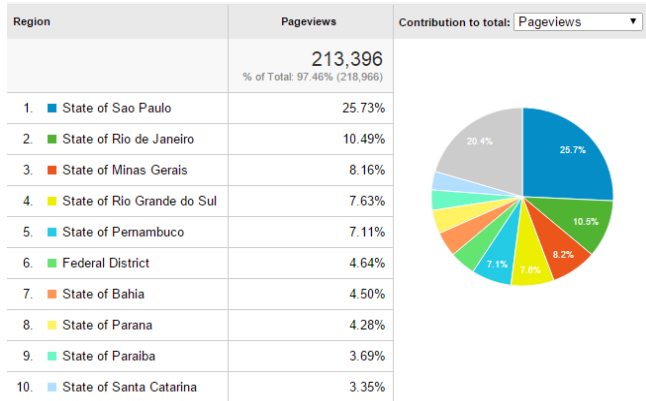


Figure 1. MCN Access Locations

3. RESEARCH APPROACH

The main objective of this research is to analyze the benefits perceived by the general population by the use of applications based on OGD in the context of federal elections, especially the case of MCN application and the Brazilian elections of 2014.

From this objective, we derived the following research questions:

RQ1: Where do people usually search for information about politicians and election candidates?

RQ2: How do people compare independent websites based on OGD and the official government transparency portals?

RQ3: Are independent websites based on OGD capable of influencing citizens' decisions?

RQ4: Do people consider that websites based on OGD in the domain of politics are capable of helping to reduce corruption?

The approach for this research was based on a survey deployed on the website during the period of Brazilian elections and was systematically organized into three phases. In the first phase, the goal was to define, evaluate and validate the survey. In the second phase, the survey was publicized and the data were collected, followed by the third phase, when the data were analyzed.

3.1 The Survey

The survey questions were created in order to answer the research questions. The first version of the questionnaire was defined in July 2014 and was revised for one month. The definition and revision was accomplished together with Ph.D. and M.Sc. researchers in computer science, in conjunction with one market specialist and one member of Brazilian Federal Ministry of Prosecution.

A pilot project was conducted with this survey version using 7 respondents, and a set of non-technical improvements was made to increase the quality of the survey, such as rewording some questions more clearly, including information about questionnaire

objectives and respondents' privacy, and adding a statement about the estimated time for answering the questionnaire.

3.1.1 The Questions

The final questionnaire is an online form composed of a set of questions, divided into four groups in order to facilitate the answer of research questions: (i) demographic data which include each participant's age and gender, as well as his/her home state; (ii) whether and how the respondent searched for information about politicians and candidates; (iii) comparisons between the website and the official government transparency portals and (iv) personal impressions about vote influence and corruption reduction. The questionnaire also includes two other groups of questions: (v) usability analysis and (vi) comparison with similar non-government portals. Due to these two groups of questions being defined for internal use in order to improve the website, they will not be included in the analysis.

The questionnaire is only in Portuguese and includes a variety of question types, mainly multiple choice and checkbox for direct questions, and scale options, ranging from 1 to 5, for comparison questions. In addition, some questions' responses lead to distinct questionnaire paths. For example, for the question "Do you search for information about previous parliamentary activities of current candidates before to decide your vote?," only if the response is "sometimes," "frequently" or "always," instead of "never" or "rarely", the next question is about the sources the respondent uses to search for the information. Moreover, some questions require more subjective data for better understanding and include open text fields. For example, the question about whether the site influenced the respondent's voting decision: an open text field encourages the respondent to explain the influence.

3.2 Data Collection

The online questionnaire was published only online through a Google forms questionnaire. Then, it was publicized by two main channels: the MCN Facebook page (www.facebook.com/meucongressonacional), with about 2,000 followers, and the MCN website, with a modal page on the landing page and a horizontal navigation bar on the top of all pages of the website calling for participation.

The questionnaire was made public from September 17 until October 31, 2014, the core period of Brazilian elections. The first round occurred on October 5 and the second round occurred on October 26. During that period, the website received 191,000 thousand page views from 58,000 thousand unique users; the questionnaire link received 897 clicks and was completed by 280 respondents.

3.3 Data Analysis

After the data were collected, we began the data analysis in an effort to directly answer to the research questions, according to question groups.

For RQ1, the questions were *Do you search for information about previous parliamentary activities of current candidates before deciding your vote?* and *Do you search for information about parliamentarians' activities during their mandate (i.e., outside of the election period)?*, conditionally followed by *Where do you use to search for that information?* only if the response was positive.

For RQ2, the questions were *Do you already visit other websites focused on politicians' data*, conditionally followed by the comparison of the websites according to ease of use, quantity of

information, perceived usefulness, and general experience criteria, derived from [29].

For RQ3 and RQ4, there are direct questions: *Did your visit to Meu Congresso Nacional have or will it have any influence on your voting decision in these elections?* and *Do you believe that initiatives such as the Meu Congresso Nacional that provide information about the activities and expenditures of politicians can help to reduce corruption in Brazil?* Each question is followed by an open text field asking the respondent to comment on the response, and responses were analyzed qualitatively.

4. SURVEY RESULTS

This section presents the analysis of the data collected in the survey and then discusses the results. First, the overall results are presented according to question groups. Then, the study's threats to validity are also discussed.

4.1 Overall Results

The survey was responded to by people of all ages, from 16 to 67 years old, in a distribution similar to Brazil's age distribution [30]. It is important to note that in Brazil, to vote is mandatory from 18 to 70 years old, and optional to people from 16 to 17 and older than 70. In addition, the survey was responded to by people spread throughout all Brazilian regions, in a distribution also similar to the Brazilian geographic distribution [31]. Moreover, the survey was responded to mainly by men, who were responsible for 68% of responses, and women were responsible for 32% of responses. The age distribution of respondents is shown in Figure 2, and the regional distribution is shown in Figure 3.

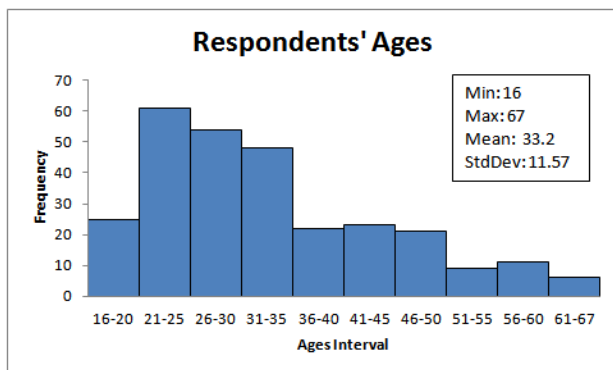


Figure 2. Respondents' age distribution

4.1.1 How do people usually search for information about politicians and election candidates?

This question aims to map the current scenario of data and information consumption by citizens. First, it is important to assess whether people usually search for politicians' data, and then how they do it.

Results show that website respondents usually search for politicians' data. This result is expected and clearly biased due to the fact that respondents was already visiting a website with this purpose, MCN. Despite this bias, it can be noticed that citizens search for information much more during the electoral period than during politicians' mandates, as shown in Figure 4.

Considering only respondents who search for data with a frequency equal to or higher than "sometimes," results presented in Figure 5 show that during electoral periods, citizens look for

data mainly on search engines (60%), followed by official government websites (57%), traditional news channels outside the Web (TV, newspapers, etc., 55%) and on social networks (52%). But after elections, despite the fact that people continue to gather data from search engines (50%) and official government websites (46%), they focus on independent blogs and websites (57%) and the Internet portals of traditional news channels (48%). Moreover, it can be noticed that citizens do not use to access specific websites like MCN: During the elections period, it was the 6th choice (45%), and during the mandate, it was the last choice (26%).

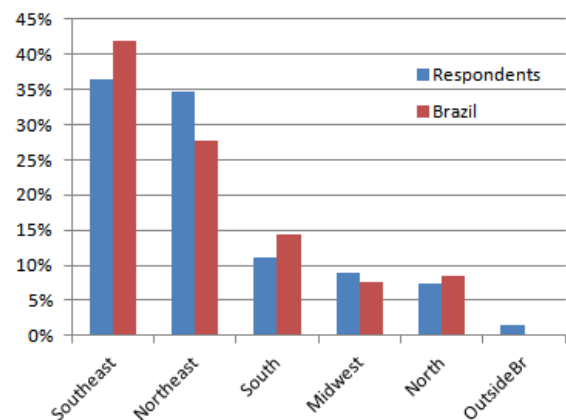


Figure 3. Respondents' regional distribution

4.1.2 How do people compare independent websites based on OGD and the official government transparency portals?

In a well-known paper, Robinson et al. [12] argued that "it is preferable for government to understand providing reusable data, rather than providing Web sites, as the core of its online publishing responsibility." Despite it being a well-cited paper, little empirical evidence to support this argument can be found in the literature. Thus, in this study we also aim to verify whether, according to citizens' point of view, the MCN website using OGD data is better than the official websites.

For that, the questionnaire has a path selection question, asking the respondent if he/she has already visited, or used to visit, government websites containing politicians' information. For this question, 65% of respondents answered that they already used official government websites, and only they were redirected to answer the following questions regarding comparing government initiatives and MCN.

The majority of the respondents who looked for information about politicians on government websites, 77%, are familiar with the website of Tribunal Superior Eleitoral (TSE, Superior Electoral Court), the main Brazilian source about elections. In addition, 58% had already visited the website of the Chamber of Deputies, 54% the website of the Federal Senate and 54% the main Brazilian portal brasil.gov.br, while 21% pointed to other websites.

The comparison among MCN and government websites was based on four criteria: (a) ease of use, explicitly explained as "how easy it is to find desired politician or information you are looking for"; (b) quantity of available information; (c) perceived usefulness and (d) general experience. The questionnaire has a general question, *Comparing MCN with government websites*

containing politicians information, MCN is, followed by criteria. The responses were in the format of strength questions ranging from 1 to 5, with the meanings of “much worse,” “worse,” “similar,” “better” and “much better,” respectively. In all criteria, the values of better and much better together are higher than the other values: 70% considered MCN to have a better or much better ease of use, 68% considered the quantity of information better or much better, 70% considered MCN more useful than governments websites and 75% considered their general experience using the site better or much better than their experience on government websites. Detailed responses are shown in Figure 6.

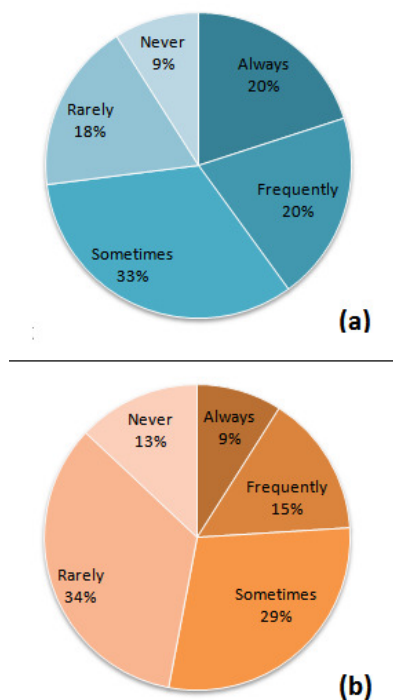


Figure 4. Frequency with which people look for politicians' data. During the elections (a) and during mandates (b).

This result strongly supports Robinson's argument that it is preferable for government to provide reusable data rather than websites. Citizens consider a modest website, developed by a very small team with almost no funding, better than the official government websites developed over years and using government infrastructure. In addition, despite the fact that it is obvious that the government has much more information than MCN, the perception of the population is that MCN contains more data. A possible reason for that is the difference of perceived ease of use: Using MCN, people can easily find desired information, but on government websites, the difficult-to-find information induces citizens to conclude that the information is not available.

4.1.3 Are independent websites based on OGD capable of influencing citizens' decisions?

One of the most claimed benefits of transparency and OGD is its potential to increase accountability, citizen participation and engagement. Thus, one of the most important results of a website focused on politician data is to support voting decisions by

showing to the citizens what the candidates actually worked on during the previous mandate, and who funds the current campaign, among other data. Thus, to answer this research question, the questionnaire contains one direct question: *Did your visit to Meu Congresso Nacional have or will it have any influence on your voting decision in this election?* Responses were also in the format of strength values, ranging from 1 — Strongly Disagree to 5 — Strongly Agree. As shown in Figure 7, 58% of respondents agree (or strongly agree) that their visit to MCN influenced their voting decisions.

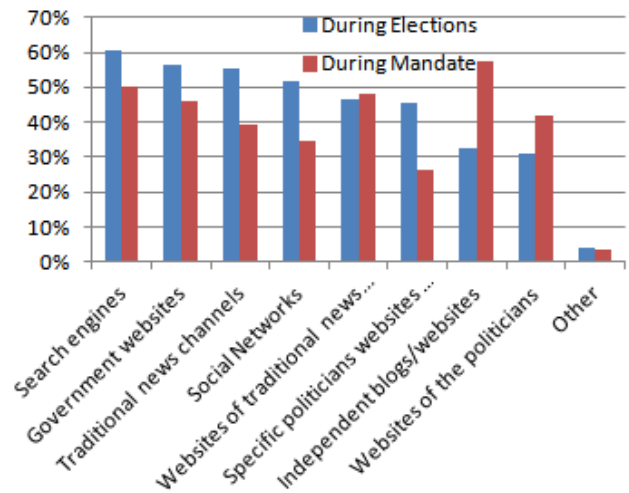


Figure 5. Where people search for politicians' information

The qualitative analysis of the next question, which encourages respondents to comment on their responses, can classify responses into four main groups: (i) people who completely changed their voting decision after knowing a bit more about their candidates; (ii) people who were in doubt about two candidates and whose visit to MCN helped them to choose their candidates; (iii) people who reinforced their previous voting decisions after visiting MCN and (iv) people who argued that their candidate selection was based on other factors, mainly individual and party ideology, and that MCN data are not sufficient to influence their voting decisions.

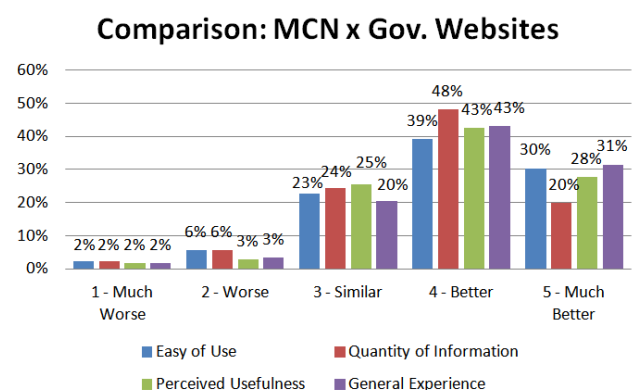


Figure 6. Comparison between MCN and government websites

4.1.4 Do people consider websites based on OGD in the domain of politics capable of helping to reduce corruption?

Studies [9][32][33] point out that one of the most claimed benefits of transparency and OGD are their potential to decrease corruption. Otherwise, corruption assessment is still a difficult task due to the difficult-to-measure corruption levels, and in the context of transparency and OGD, it is difficult to directly associate transparency with corruption decreases.

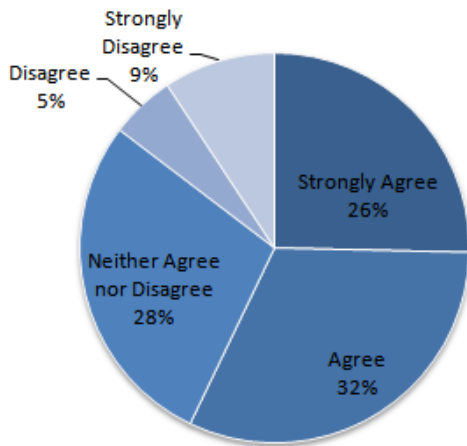


Figure 7. Did your visit to MCN have or will it have any influence on your voting decision in this election?

Analyzing the data about the perceived value of MCN and corruption decreases, we can claim that undoubtedly people agree that websites based on OGD in the domains of politics, like MCN, can help to reduce corruption: 71% of respondents strongly agree or agree with it; accordingly, this is shown in Figure 8.

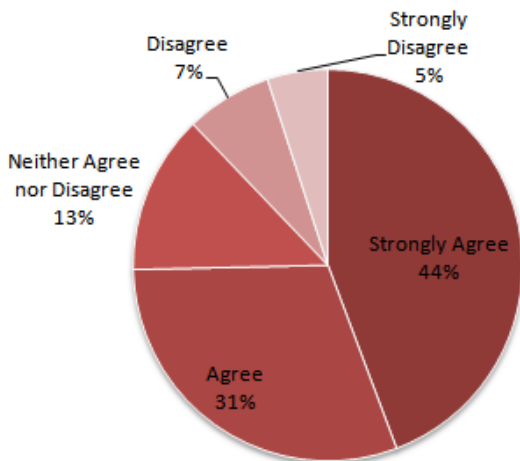


Figure 8. Do you agree that initiatives like MCN, which publish information about political activities and expenditures, can help to reduce Brazilian corruption?

The qualitative analysis of the next open question, asking respondents to comment on their responses, shows mainly that Brazilians do not think that transparency cannot reduce corruption by the inquiry or condemnation of corrupt politicians, but by the politicians and citizens behavior change. Responses can be classified in four groups: (a) those who believe that to know that

their activities are public and that people will investigate them before deciding their votes can make politicians change their attitudes; (b) those who believe that people will change their voting decisions by knowing politicians' attitudes and will naturally elect those who are not corrupt; (c) those who believe that it will have no influence, due to they think that Brazilian justice is inefficient and also corrupt and (d) those who believe that it will have no influence, due to the fact that the population does not look for information about politicians before deciding their votes.

4.1.5 Summary of Overall Results

Regarding RQ1, results show that people look for information about politicians much more during the electoral period than during the mandate and also show that search engines and official government websites are the main sources for government data. In addition, during the elections period, people also search for data mainly on traditional news channels, such as TV and newspapers, and on social networks. Nevertheless, during the mandate, people prefer to gather information on independent blogs and websites, as well as on independent websites. In addition, one important result is that people do not gather politicians' data on websites based on OGD. One of the reasons could be the fact that OGD publishing and this kind of initiative are just beginning and are not so popular yet. Another reason could be that people do not trust this kind of initiative. However, on the qualitative analysis of respondents' comments, this concern was not related.

Regarding RQ2, results strongly support Robinson's argument that it is preferable for the government to understand providing reusable data, rather than providing websites, as the core of its online publishing responsibility. Despite the disproportional available resources between the government and the research group who developed the application, the perceived ease of access, quantity of information, utility and general experience using MCN were much higher than those of official websites.

The results related to RQ3 point out that this kind of initiative is capable of influencing citizens' voting decisions, acting directly on citizen participation and engagement, due to more than half of respondents stating that their voting decisions were influenced by the website. This result supports the main arguments of OGD and encourages more initiatives for data openness and transparency.

Finally, regarding RQ4, despite people not considering that transparency can reduce corruption by legal means, they consider that it will occur by the change of behavior both by the observer, the citizens, as well as by the observed, the politician.

4.2 Study Validity

The construct validity refers to the degree to which inferences can legitimately be made from the operationalizations in the study to the theoretical constructs on which those operationalizations were based. In this study, each research question was related to one or more questions, directly measurable. In the study, the main threat to construct validity can be found in the comparison between MCN and the government websites due to the concept that a "better" website is difficult to measure. Thus, in order to minimize this threat, the comparison was derived from an extensive website evaluation study [29] and consider four criteria: ease of use, quantity of information, perceived usefulness, and general experience.

Considering internal validity, whether the experimental design is able to support conclusions on causality or correlation, we adopted a more descriptive analysis, analyzing each answer

separately. Although it served to achieve meaningful conclusions, a multivariate statistical analysis would be interesting to determine further relationships.

Regarding external validity, that is, the extent to which the results of a study can be generalized to other situations and to other people, despite the number of respondents not being large, the study can be generalized to describe the Brazilian population. First, the survey respondents were randomly chosen by the population who accessed the website during the electoral period. Actually, they were not chosen, but they chose to participate in the survey, due to a survey call shown to all website visitors. In addition, the survey was responded to by people of all ages, from 16 to 67 years old, in a distribution similar to Brazil's age distribution. In addition, the geographic distribution of respondents was very similar to the Brazilian geographic distribution. Thus, we can consider that these facts eliminates the threats related to a biased sample.

5. CONCLUSIONS

The main objective of this study was to better understand the benefits perceived by the general population regarding the use of applications based on OGD in the context of federal elections, especially the case of Meu Congresso Nacional (MCN) application and the Brazilian elections of 2014.

In this paper, we presented the results of a survey involving people who accessed MCN in September and October 2014, involving people of all ages, ranging from 16 to 67 years old, and all Brazilian regions, in a distribution very similar to the official Brazilian distribution of age and population.

Results point out that traditional search engines and official government websites are still the main sources of information for politics data, while websites and applications based on OGD are not so popular. However, the analysis strongly supports Robinson's argument, which claims that governments should provide reusable data rather than websites due to that the perceived ease of access, quantity of information, utility and general experience using MCN was evaluated much better than those of government websites.

In addition, the results also support the arguments that claim that OGD and transparency can have a positive impact on the quality and effectiveness of political debate, citizen participation, engagement and collaboration. In this sense, more than half of respondents stated that their voting decisions were influenced by the website. Although it is a preliminary result and obviously it needs deeper study, this results points out that the appropriated use, or misuse, of OGD can even change the election results. Moreover, results also support the argument that OGD can lead to the decrease of corruption.

Despite the study being specific to one initiative in one domain, these results show realistic data based on a broadly used application, and on the impression of its users, unlike many studies that show only conceptual or high-level analysis. Then, it provides useful data to demonstrate the impact and accrual of OGD initiatives and can be used to refute the arguments that challenge the benefits of OGD.

As future works, we can point to a broader study including other similar websites, and the data crossing between the responses and respondents' ages and geographic regions in order to better understand citizens' behavior and to identify response patterns.

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