

E-GOVERNMENT IN SAO PAULO: the case of the restructuring of Channel 156 in the city of Limeira

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ABSTRACT The study aimed to identify the consequences of a low-cost restructuring process of an e-government initiative in the state of São Paulo. The measures adopted strengthened interaction between government and citizens and the initiative received an award for the good results achieved. A single-case study was carried out on Channel 156 of the municipal government of Limeira. Data were collected through semi-structured interviews, participation in meetings with the program's managers and technicians, and analysis of internal documents available to researchers. The findings contribute to studies on the use of information technology by public agencies, an area as yet poorly explored. The research may help in restructuring similar initiatives in other contexts through the use of appropriate management and information technology tools, resulting in better service to citizens.

Keywords: E-government. Information technology. Single-case study. Public management.

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I INTRODUCTION

The subject of the study addresses the use of Information and Communication Technologies (ICTs) available in modern society, which, following technological advances in the late 1990's in Brazil, enabled the inclusion of public administration in the routine activities of people, seeking to bring government services closer to the population through technology. That historical context gave rise to electronic government (e-Gov), understood as the ability of governments to deploy government information and services according to the needs of people in ways that were previously unimaginable by other means (DINIZ; BARBOSA; JUNQUEIRA; PRADO, 2009).

Its aim is to create models for activities related to Information Technology

(IT), through the use of various tools and information and services systems, as an essential element that affords transparency in public administration.

Electronic government is offered in different models and stages in different countries, and is considered essential to improving public management, focused on providing good services to the population (UNITED NATIONS, 2010). However, the public sector lacks and requires a qualitative leap in service provision to meet the demands of society, through investment in technology and automation of operating, production and administrative processes.

Within this context, the aim of this study is to understand the consequences of some of the measures that strengthened interaction between government and citizens in a noteworthy initiative in the region of Limeira, nominated for awards

in the field of IT management for public administration.

The program chosen for this single-case study was Channel 156, an initiative developed by an agency of the municipal government of Limeira and which has great potential to be replicated in other municipalities.

The Channel was restructured as a result of changes in the political scenario in 2013 and in the municipal government, whose goals included stimulating and modernizing public management. The restructuring process provided an active communication channel between government and people, via website, smartphone app, and, especially, calls to the city's 156 line in order to solve problems, avoiding the need for citizens' movement and physical presence.

The initiative is an interesting research opportunity for being an intermediate channel between two institutional actors which was restructured through low-cost IT initiatives, and was short-listed for the 2015 CONIP (Congress of Information Technology and Innovation in Public Management) Excellence Award, which is a benchmark award in innovation and initiatives in using technology in public management.

The study may help future initiatives in similar contexts through the details of the Channel's IT resources described in the paper, thus contributing to further studies in this field of knowledge.

2 LITERATURE REVIEW

This section introduces definitions of a few terms frequently used throughout the paper, divided into three parts. It starts with the concept of e-government, its strategic role for ICT in government, the transition typologies and comparative frameworks of e-Gov levels. In the second part of the theoretical outline, the topic is examined in greater detail in Brazil with a brief history of the tool and its IT applications in the national public sector, the United Nations world index of e-Gov levels, and a description of prominent

initiatives in the last few years. The third and last part features the example of an initiative on the subject in a Brazilian city, Channel 156, explaining its functions and how it has become a model through qualified management of its resources.

2.1 Electronic Government

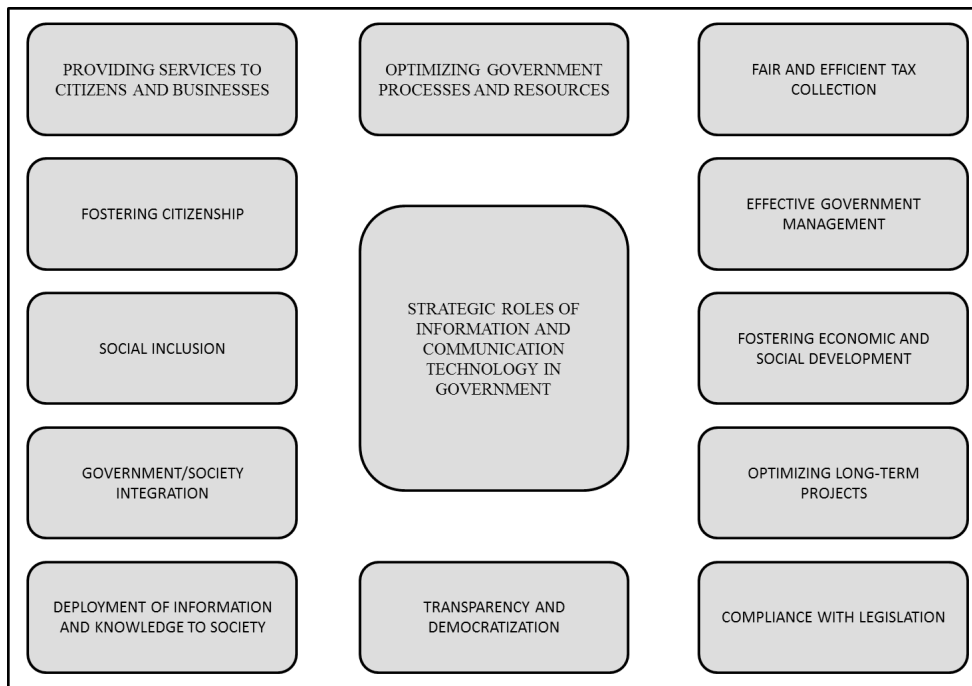
Electronic government is a unique communication infrastructure used by different public agencies where information and communication technology is used intensively to improve public management and citizen services. Therefore, its goal is to place the government within everyone's reach, increasing the transparency of its actions and enhancing citizen participation (ROVER, 2009).

According to Gartner Group (2000), the concept of e-government entails the continuous optimization of services, participation of the electorate and governance by transforming internal and external relationships with the use of technology, the Internet and new media.

In short, e-Gov is a purely instrumental form of managing government functions (Executive, Legislative and Judiciary) and attaining the goals established by rule-based democracy which uses new information and communication technologies as an active interaction tool to communicate with people and provide public services. This technology transmits information more quickly, seeking to reduce bureaucracy in services and promoting speed and agility, avoiding users' movement and physical presence in public service centers (ROVER, 2009).

The strategic role played by information technology in government is shown in Figure 1, which features its main positive aspects concerning society. In the Figure 1 is shown that the information technology is necessary to provide services to citizens, optimize government process and resources, to offer transparency and democratization, for social inclusion, among others.

Figure 1. Strategic roles of information and communication technology in government



Source: Adapted from Vieira and Santos (2010)

According to Diniz, Barbosa, Junqueira and Prado (2009), e-Gov implementation by the public administration is associated with the pressure of intensive use of ICTs by citizens, private companies and non-governmental organizations; migration from paper-based information to electronic media and online services; and advancement and widespread use of public telecommunications infrastructure and the internet.

Electronic government comprises three institutional actors, identified as: G2G (Government to Government), G2B (Government to Business) and G2C (Government to Citizen). According to Goes and Damasceno (2004) these three types of interaction are:

- a) Government to Government: this involves the actual government in its horizontal relationship with its own agencies (ministries, secretariats, departments, etc.) and its vertical relationship between different government levels (federal, state, municipal);
- b) Government to Business: this corresponds to the government's relationship with companies, for example, procurement of goods and services in the productive sector through electronic means via so-called electronic auctions;

- c) Government to Citizen: this relates to government action to provide citizens with public services and information through electronic means.

The same theoretical framework underlines relations with stakeholders and the strategic role for information and communication technology in government to achieve that goal.

Since 2001, the United Nations has collaborated by developing scientific research and publishing regular reports on the theme of e-government, presenting cases from member countries and statistical data ranking countries in relation to e-government.

In the 2016 report (UNITED NATIONS, 2016), the top 20 countries in the overall e-Gov development index are developed countries with high HDI (Human Development Index) and per capita income. That means that countries with greater financial resources and high technological capability provide advanced e-Gov initiatives thanks to the favorable setting in those countries, aimed at involving people. Table 1 shows the top 20 countries with the highest e-government development index worldwide.

Table 1. Top 20 countries in e-Gov development

Rank	Country	E-Gov Development Index	Rank	Country	E-Gov Development Index
1	United Kingdom	0.9193	11	Japan	0.8440
2	Australia	0.9143	12	USA	0.8420
3	Republic of Korea	0.8915	13	Estonia	0.8334
4	Singapore	0.8828	14	Canada	0.8285
5	Finland	0.8817	15	Germany	0.8210
6	Sweden	0.8704	16	Austria	0.8208
7	Netherlands	0.8659	17	Spain	0.8135
8	New Zealand	0.8653	18	Norway	0.8117
9	Denmark	0.8510	19	Belgium	0.7874
10	France	0.8456	20	Israel	0.7806

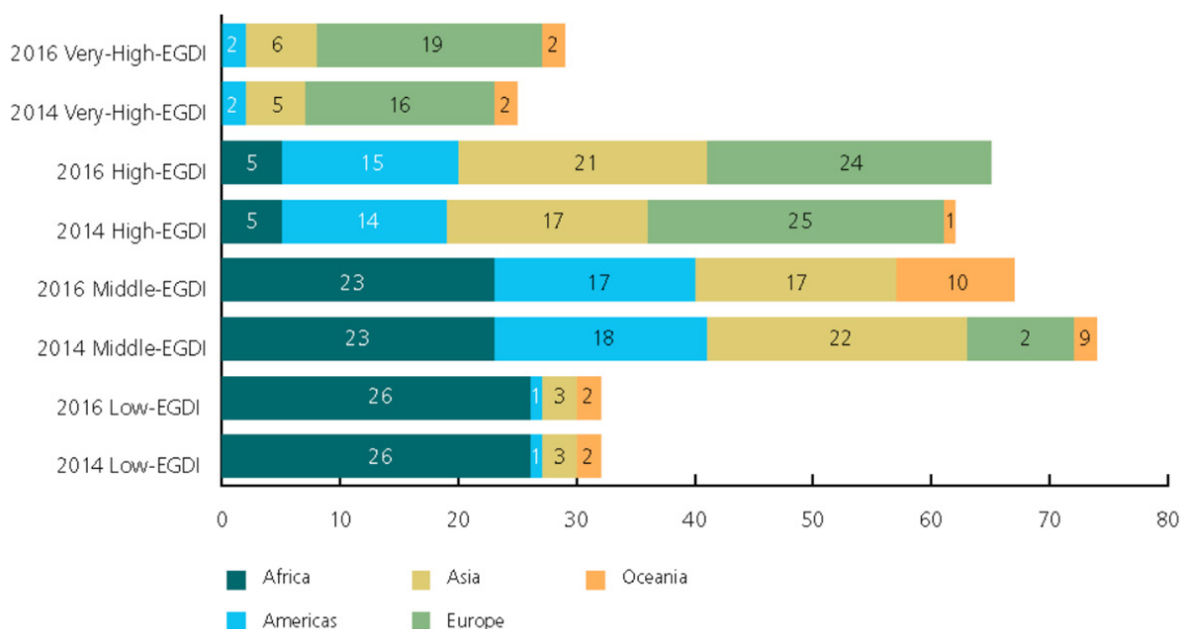
Source: Adapted from United Nations (2016)

In emerging and developing countries, the incentive is to develop online service websites and educational and telecommunications infrastructure to reduce the difference in e-government development levels compared to developed countries, which are largely represented in the previous table. That requires

earmarked investments in those areas, since it makes no sense to provide such services to citizens who do not have adequate access to the Internet.

Figure 2 shows the number of countries grouped by E-Government Development index (EGDI) level and geographical regions e-Gov development index by continent.

Figure 2. Number of countries grouped by geographical regions



Source: Adapted from United Nations (2016)

Figure 2 illustrates the gaps that have persisted in e-government development among regions during the last years. A majority of countries in the very-high-EGDI group are from Europe, which comprises 66 per cent in 2016. At the other extreme, the low-EGDI group mainly consists of African countries, which comprises 81.2 per cent.

Table 2 features the best ranked American countries in e-Gov development.

Table 2. Top 10 countries for e-Gov in the America

Rank	Country	E-Gov Development Index
1	USA	0.8420
2	Canada	0.8285
3	Uruguay	0.7237
4	Argentina	0.6978
5	Chile	0.6949
6	Brazil	0.6377
7	Costa Rica	0.6314
8	Barbados	0.6310
9	Colombia	0.6237
10	Mexico	0.6195

Source: Adapted from United Nations (2016)

Right below the North American countries come South American countries and two countries from the Caribbean. The indexes of the Caribbean countries demonstrate that specific initiatives are capable of boosting e-Gov levels, since they have small populations and such initiatives are easily absorbed by users with adequate telecommunications services. Regarding the South American countries, according to the United Nations, all of those included in this ranking have increased efforts to create and expand telecommunications infrastructure services, especially Uruguay, which is the largest exporter of software and technologies in the subcontinent, and Chile, which created Startup Chile to support new companies through the reduction of local bureaucracy and a new law that allowed entrepreneurs to register their businesses online in just one day. All this activity related to economic development resulted in a number of technology prospecting companies which are now established in the country, helping to strengthen this prominent position in Latin America.

2.2 Electronic Government in Brazil

Electronic government in Brazil, as in other countries, aims to democratize access to information, expand debates and streamline the delivery of public services focused on the effectiveness of government functions, through the use of modern information and communication technologies. The model was created in the 90s, more specifically with the provision of electronic services by the Brazilian federal government (FERRER; SANTOS, 2004).

The pioneering services provided a channel of access to communications and also to the Internet, which at the same period initiated operations in the country for certain government levels thanks to commercial Internet providers. Thus, a few positive results emerged with the changes introduced by the government over the decade, such as the creation of the online Income Tax Declaration, considered one of the first interaction websites between government and population. Years later, following the example of other countries, the “Green Book” of the Information Society Program of the Ministry of Science and Technology was launched in Brazil, corresponding to an initial phase of debates to implement measures towards creating the Information Society. This type of document proposes:

[...] guidelines for structuring communication infrastructure, regulation, education and universal access to the digital environment, as well as for the development of government action that also promotes greater efficiency and transparency through intensive use these technologies (COELHO, 2001, p. 112, author's translation).

Another important initiative relates to SPED – Public Digital Bookkeeping System, with the aim of enhancing interaction between tax authorities and taxpayers to improve process control and support to tax authorities, as well as provide faster access to taxpayer information, with more effective monitoring of operations and cross-checking of electronic audit data (GERON; FINATELLI; FARIA; ROMEIRO, 2011).

Table 3 provides an overview of IT use in the public sector.

Table 3. Overview of the evolution of IT use in the public sector

	Beginning	Centralizing	Outsourcing	E-Gov	Contemporary e-Gov
Period	50s to mid-60s	Mid-60s to late 70s	80s	90s	21 st century on
Management Model	Non-structured, based on support from suppliers.	Centralized.	Centralized with outsourcing.	Under review, but still centralized with outsourcing.	
Main Technologies	Electromechanical Equipment	Mainframe		Server client and web (Internet)	Web, multichannel
Main Applications	Payroll	Control systems	Management systems	Digitalization of manual services, services for citizens	Electronic services for citizens.
Focus	Automation of financial processes	Financial and administrative control	Financial and administrative management	Cost reduction and improved services for citizens	Single service point for citizens

Source: Adapted from Reinhard and Dias (2005)

In spite of all the efforts in that decade to modernize both virtual and physical public administration related to e-Gov, as of 2005, due to the maturity of federal government loans until 2014, the country dropped 24 positions in the overall e-Gov development index, from 33rd to 57th (UNITED NATIONS, 2014).

Despite this apparent decline in recent years, the country stands out in a few specific initiatives disclosed in the UN report, such as the Bolsa Família, which, through the use of a magnetic card, transfers income from the government to two million users, being a social safety net program in the country. Another positive example disclosed in the report is a project developed by the Marist Solidarity Network in Santa Maria, Rio Grande do Sul, through the creation of a Social Inclusion Center. This project trains young people to understand, use, and create products related to information technology, including recycling of old computers for resale, robotics and even assisted technology.

Reviewing the literature of the other reports released by the UN in recent years, it is also perceived that the lack of online services and poor telecommunications infrastructure are the main causes of the fall of Brazil's rank.

2.3 Channel 156 – Municipal Government of Limeira

Channel 156 of the municipal government of Limeira is a transparency tool characterized by its innovation in the public sector, developed by

the local administration and functioning as a link between people and the government.

According to the Channel's coordinator, Limeira's e-government program started in 2013 when the new municipal administration took office and discovered that its channels of communication and exchange of information with society were few and ineffective, and did not function as promoters of popular participation.

In order to offer a public administration that was ethical, effective, efficient, and included popular participation, the municipal government of Limeira implemented initiatives to improve citizen services, streamlining existing communications channels and using information technology resources in a rational, economical and innovative way. The issue of modernization was addressed by increasing staff numbers, purchasing equipment and integrating management among the municipal departments.

Regarded as a promoter of popular citizenship, Channel 156 has the following objective: to encourage citizens to use its means of communication to file opinions, complaints, recommendations and service requests in order to solve or reduce the problems they face.

There are four platforms through which people can communicate with the government, listed here in order of use: calling the 156 line, accessing the tab "156 Service" in the government's website, using the "Limeira 156" smartphone app, and in rare cases, via personal attendance.

Figure 3 shows the 156 service site layout on the website of the Limeira city.

Figure 3. Government's website - 156 service

ATENÇÃO

Os dados coletados neste formulário passarão por uma análise antes de virarem oficialmente uma nova ocorrência. Dentro de um prazo de até 8 horas úteis você receberá um email confirmando se a ocorrência foi aberta.

DADOS PESSOAIS

Nome:
Digite seu nome completo

Email:
Digite um email para contato

Celular:
Digite um número de celular

DADOS DA OCORRÊNCIA

Local:
Digite o endereço da ocorrência

Número:
Digite o número do local informado (se houver)

Serviço:
**LIMPEZA DE TERRENO PARTICULAR

Reclamação:
Diga sobre o que quer reclamar

Source: Limeira (2016)

After the citizen has registered his or her contact, a protocol number is provided for follow-up via phone or website. Internally, the contact is then forwarded to the department the attendant considers most relevant, and deadlines are established for a final answer. The 156 attendants are considered first level support, and the departments are considered second-level technical support.

This tool has afforded improved service to the population, reaching a larger number of people. It is based on open-source software which can be downloaded free of charge directly from the websites of the developers-maintainers, including instruction manuals.

To meet the demand, Channel 156 has an intangible asset of seven phone lines for simultaneous phone service. Altogether, there are six staff members working at the 156 center.

3 METHODOLOGY

Given the proposed problem, qualitative methods seem to be the most appropriate, as there are few previous studies on the subject (BENBASAT; GOLDSTEIN; MEAD, 1987; MENEZES, 2005).

The single-case study presents the opportunity and the understanding of the importance of researching an e-Gov initiative, and there are few studies on the restructuring of e-government channels.

The research was carried out with the use of the Channel 156 resources, such as: smartphone app, regular calls to assess its functionality, and use of an online page on the municipal government website.

It was used the content analysis technique, which consists of various techniques where it seeks to describe the contents issued in the

communication process, whether through speech or texts (BARDIN, 1977). Thus, the technique consists of procedures that provide the lifting indicators, allowing the execution of inference knowledge. According to Oliveira (2008) content analysis has different techniques that can be addressed by researchers.

For the analysis stage, data triangulation was performed with the use of non-structured interviews with an audio recorder, analysis of publications available in newspapers of the city and surrounding region, reading of theme-related documents, and non-participant observation in meetings, gatherings and academic conferences on the theme of e-Gov. Data triangulation enabled a richer and more detailed description of the phenomena, exploiting temporal and local differences as a form of comparative investigation of the different sources for validation (DENZIN, 1978).

In the case of this study, the generalization method should be analytical generalization (also known as inferential generalization, heuristic generalization or transferability). Thus, a previously developed theory serves as a benchmark for comparison with the results obtained in the case studied. But it is up to the reader to generalize the findings (ZANNI; MORAES; MARIOTTO, 2009; MARIOTTO, ZANNI; MORAES, 2014).

Channel 156 was chosen for being a successful e-government initiative aimed to provide a means of intermediation between citizen and government through the transmission of information, suggestions, requests and complaints, to be addressed by the relevant department.

This tool has become a pertinent opportunity for in-depth investigative study thanks to internal restructuring by means of small purchases of movable goods, relocation of employees from other sectors and communication and computer equipment, as well as use of open source, free software, being acknowledged as a successful initiative in ICTs, nominated for the CONIP (Congress of Information Technology and Innovation in Public Management) Award.

This discovery can enhance the implementation of e-Gov in various contexts throughout the country, generating greater contact between the two institutional actors and improvement of government action.

For the study in question, six relevant questions were formulated for the Channel 156 coordinators:

- What role does ICT play in Channel 156?
- What are the main challenges and points to develop?
- How does the internal operation of the Channel work?
- What is the motivating aspect behind the creation and structuring of the Channel?
- What are the main results obtained from the implementation and its benefits?
- With the achieved implementation and restructuring, how have people reacted regarding the Channel?

The information was collected in two meetings held with the Channel 156 coordinator, one in May and another in August 2015, held at City Hall, besides informal conversations with the team of attendants, participation in meetings and internal documents made available to the researchers.

4 RESULTS

According to the interviewed coordinator, the role of technology was instrumental in restructuring Channel 156. Technology is highly important in the Channel's processes in managing personal data of its users, sharing data and information with the city's departments, but mainly for being the management model of an e-government application.

According to a file provided by the Canal 156 coordinator for the 2015 CONIP Excellence Award, it was found that in 2013, the year in which the new team took over the Channel Coordination, it was inefficient and did not function as a promoter of popular information, so much so that the researchers had difficulty to find data prior to the year of restructuring due to poor organization in the past.

In order to solve the existing problems and take advantage of the opportunity identified for improvement, the municipal government of Limeira decided to innovate in terms of processes and systems, adopting international practices of IT service management adapted to the reality of Channel 156. In addition, open source web-based software tools were adopted to manage requests,

leading to improved information management for decision making regarding citizens' requests. Owing to the similarity of Channel 156 with call centers, in conceiving the project and management methodologies for IT and the Channel, it was assumed that it was intended to be a single point of contact of the population with the municipal government, and its service processes would those of incident management and response to requests. Together with the renewal process, in 2014 a smartphone app was created as a new means of receiving citizens' demands, adding important information such as images and maps of occurrences.

To this end, both the departments and the Channel area created attractive synergy within the study.

[...] there is integration between the areas and mutual understanding between the attendants and the departments' staff about treating the information received from citizens with confidentiality. (Verbal information – Channel 156 coordinator, author's translation).

The Channel operates all working days and also on Saturdays with its full staff, whose job is to receive contacts from the population and receive information from the departments regarding their solution.

To file a contact via telephone, people must inform details such as name, email address and taxpayer registration number. This generates a protocol number used for follow-up on the website. However, if a citizen wants to check on this protocol, he or she can call 156 and inform personal details so that the attendant can provide the information. Everyone can file various contacts or complaints per call, but each one has its own protocol number so they can differentiate their requests. This makes the process faster by solving individual processes simultaneously. The attendant taking the call decides to which department the citizen's request should be forwarded.

However, there are some points that need improvement and development. According to the coordinator, adapting "extra" functions like automatic messages when the lines are busy would be an additional form of interaction with the public, as well as an automatic report of failed calls. Another point is the screening received from the three usual bases, which are manual;

he believes that extra investment could make the process even more automated.

Regarding the motivation in the improvement period initiated in 2013, the coordinator stresses that it stemmed from the innovation and originality of transforming Channel 156 along the lines of a Service Desk, in accordance with CobiT 4.1 and ITIL V3 methodologies and best international practices, which can be defined as set of IT tools that define and manage levels of services and incidents. Such innovation in the management system of Channel 156 enabled rapid progress in managing calls from citizens, contributing to effective performance with rationalized expenditure, ensuring service efficiency. The use of the development tool called "appinventor" by the Massachusetts Institute of Technology to create the Limeira 156 app allows the creation of other solutions, employing international cutting edge technology tools for solutions to local problems in Brazilian cities, which may be useful for any municipality or website.

With the infrastructure in place and the alignment in public management between its connectors, citizens regained their trust in the 156 line, with a vastly improved service structured through government response to contacts and speed in resolutions. As a result, the monthly average of calls in May 2013, when the first statistical data started being collected, generating more essential indicators, was about 300 contacts per month, and in January 2015, with complaints about the water crisis and dengue fever epidemics, a peak of 5050 monthly contacts was reached. The number of calls recorded in the parallel data system created at the same time and launched in May 2013, which allows the retrieval of information from calls and requests from Request Tracker clients, was approximately 60,000 calls: 31% were requests for assistance, 34% were requests for services, 33% were complaints of irregularities and 2% were general contacts. The acceptance of the app by people was positive according to verbal data from the interview, so much so that, when added to data from the file sent by the award winners to CONIP, the number of Limeira 156 app downloads since June 2014 surpassed 1400, and the contacts received through the app totaled 4700, an average of 3 to 4 contacts per download. Finally, data obtained from informal conversations with the 156 line attendants are

less accurate and slightly higher than those mentioned above. They stated that some calls did not generate protocols, such as hoaxes and calls the Channel does not answer because they are outside its competence. These include requests for information about nearby sites that issue the SUS card and complaints about burnt out light bulbs and public lighting which, until the date of interview, were the responsibility of the concessionaire that managed the city's street lighting system, a service transferred to the city's executive branch in early May 2015.

5 FINAL CONSIDERATIONS

This paper aimed to examine more deeply the role of IT in specific e-Gov initiatives in Brazil, through a single-case study presented by Channel 156 in the city of Limeira. This demanded an investigation of the institutional actors involved in this study in applying IT tools in this initiative.

According to Goes and Damasceno (2004), the involvement of two institutional actors can occur in two ways. G2G involves the relations between Government and Government, its actors being government agencies in the horizontal relationship between Channel 156 and the municipal departments. G2C involves the relations between Government and Citizens and its actions to provide citizens with electronic means of access to services, platforms and tools for the exchange and communication of relevant information in the public sector.

Based on results of the qualitative analysis, alignment and synergy between business areas and IT applications are essential to meet citizens' expectations and requests in the best possible way. According to the internal file provided by the coordinator, 79% of calls were resolved on average within a 60-day period, which is considered a good level by the Channel's coordinators due to the seasonal variations occurring over the year related to climatic conditions, such as contacts and requests for inspection teams in the summer owing to the water crisis and dengue fever, typical in those periods.

The request control developed by the new coordinators resulted in management gains that directly influence the improvement of urban maintenance, affording better quality of life for all the population. The possibility of sending

photos and maps through the app reduces the need for on-site inspections and errors in crew deployment, resulting in improved logistics and savings in public expenditure. With the IT tools used, services to citizens became more effective and widespread compared to conditions before the restructuring process, since they are now able to use the 156 phone line or the Limeira 156 cellphone app (only available for Android), which is based on open-source software and can be downloaded free of charge directly from the websites of the developer-maintainer, together with instruction manuals. All this information was obtained from the triangulation of data in the qualitative part of the research.

Given the results of this application, it is hoped that the findings of this study may help to accelerate the use of these tools in other e-government contexts, providing useful information for the key points to be considered in minimizing problems related to IT, infrastructure and administrative management.

With regard to the single-case study presented in this research, March, Sproull and Tamuz (1991) argue that single-case studies provide organizations and readers with valuable mechanisms to organize and interpret the experience in order to build shared understanding. The advantage of sharing these beliefs is the possibility of expanding the potential learning resulting from a single or ambiguous event, and even imaginatively building hypothetical stories, which nevertheless have a deep meaning for the organization to structure itself based on a single study.

For Lincoln and Guba (2000), it is up to the reader to preserve the conditions of this study to apply it in other contexts, in order to facilitate his or her judgment. Concerning this study on Channel 156, it was the responsibility of the researcher to provide sufficient information and data to assist the reader.

Future researches could explore: other e-government initiatives, whether successful or not, to generate further insight on the results; databases of the results of e-government initiatives, in a quantitative approaches; people who use e-Gov initiatives, using models of technological adoption or quality assessment to measure users' perception of the initiatives; comparisons between existing e-government initiatives and implementation of an e-Gov initiative from the beginning.

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AE-GOVERNO EM SÃO PAULO: o caso da reestruturação do Canal 156 na cidade de Limeira

RESUMO

O estudo teve como objetivo identificar os reflexos de uma reestruturação de baixo custo em uma iniciativa de governo eletrônico no Estado de São Paulo. As medidas adotadas consolidaram a aproximação do governo com o cidadão e a iniciativa foi premiada devido aos bons resultados atingidos. Foi realizado um estudo de caso único no Canal 156 da Prefeitura Municipal de Limeira. Os dados foram coletados por meio de entrevistas semiestruturadas, participação em reuniões com gestores e técnicos do programa e análise de documentos internos disponibilizados aos pesquisadores. Os resultados da pesquisa cooperam para os estudos da utilização da tecnologia da informação no âmbito público, contexto ainda pouco explorado. A pesquisa pode auxiliar na reestruturação de iniciativas semelhantes em outros contextos, por meio da utilização de ferramentas adequadas de administração e tecnologia da informação, resultando numa melhor prestação de serviços ao cidadão.

Palavras-Chave: Governo Eletrônico. Tecnologia da informação. Estudo de caso único. Gestão pública.

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