

Contact Center in a Smart Cities View: a Comparative Case Study of Curitiba (Brazil), Porto Alegre (Brazil) and Philadelphia (USA)

Marie Anne Macadar

Pontifical Catholic University of Rio Grande do Sul
Avenida Ipiranga 6681, p.50, 1105 CEP 90619-900
Porto Alegre, RS, Brazil
+555133203524

marie.macadar@pucrs.br

Jorge Lheureux-de-Freitas

Pontifical Catholic University of Rio Grande do Sul
Avenida Ipiranga 6681, p.50, 1105 CEP 90619-900
Porto Alegre, RS, Brazil
+555133203524

jorge.freitas@pucrs.br

Luiza Schuch de Azambuja

Pontifical Catholic University of Rio Grande do Sul
Avenida Ipiranga 6681, p.50, 1105 CEP 90619-900
Porto Alegre, RS, Brazil
+555133203524

luiza.azambuja@pucrs.br

Edimara Mezzomo Luciano

Pontifical Catholic University of Rio Grande do Sul
Avenida Ipiranga 6681, p.50, 1105 CEP 90619-900
Porto Alegre, RS, Brazil
+555133203524

eluciano@pucrs.br

ABSTRACT

The growing number of city inhabitants and continuing rural migration to urban areas demand innovative solutions supported by technology within a new concept of municipal management: smart cities. The initiative "Call Center and Information 156" of the city of Curitiba (Brazil), is examined in this paper with two main purposes: to analyze this smart initiative and carry out a comparative study with related initiative in other Brazilian city (Porto Alegre) and also an American city (Philadelphia). Two smart city models are used here to support the analysis, which concludes that certain manifestations fit into the smart concept while others move away from the concept. The comparative study has found the common, converging and diverging features of each initiative, conducting an evaluation based on smart cities framework.

CCS Concepts

• Applied computing~E-government

Keywords

Smart Cities; Smart Governance; Non-emergency Contact Center

1. INTRODUCTION

Since the twentieth century, there has been an ongoing global trend towards the progressive displacement of rural population to cities, potential centers of better opportunities, better working conditions and quality of life. This phenomenon has generated significant urban growth and the emergence of megacities, whose challenges

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are to demand intelligent, effective and innovative solutions. Otherwise, living conditions may instead worsen as a result of problems in safety, traffic, energy, air pollution, housing, and etc, deteriorating the environment that population sought through this migration[1].

ICT has enabled interconnectivity as well as instant access to information in a context of a globalized world. This connected citizen has been aware of what happens around him and around the globe. Problems related to urban growth, often cluttered, and social exclusion are widely debated. This context in which the citizen is inserted and his awareness of the social, political, economic, cultural and environmental problems generate pressures for answers and urban policies to deal with the situation [15].

Social demand, however, is not restricted to the pursuit of life improvements for disadvantaged segments of society, since it is the State responsibility to provide quality services for all. In this sense, technology-making information available to citizens has provided the means to analyze, study and promote solutions to problems and offer better services to the population. This idea translates into the smart management concept, expressed at the municipal level as smart cities, i.e. "the city performing well in a forward-looking way in economy, people, governance, mobility, environment, and living, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens. [10]".

Underlying this concept, the necessary quality of service delivery is a necessary condition for the smart way to govern. This quality is directly related to interoperability and integration of public agencies in order to meet the demands of citizens effectively. Not only must systems but also the means that perform deliveries be integrated, so that the applicant can resolve their disputes in relationship channels covering the whole of municipal services, regardless of the public sector to which the request is made. Integration is a strategic requirement recognized by the public administration as a whole to improve its services for citizens [12].

This study focuses on the Call and Information Center 156 in the city of Curitiba (Curitiba Contact Center) in southern Brazil. It's a non-emergency contact center (Via phone, email or chat) offering

a wide range of information and services to the population of the municipality and integrating all public city departments and companies.

The purpose of this article is to analyze the Service Center 156, Curitiba, as a smart initiative and compare it with the 156 service in Porto Alegre (Brazil), and with the 311 service in the city of Philadelphia (U.S), known as Philly 311.

After these introductory remarks, this paper presents a smart cities approach. Methodology describing the format of statements, profile of respondents and a description of the process in general is part of the third section. The results of the interviews are then explained in a logical sequence, which starts with the genesis of the process and extends until 2014. The comparative study of Curitiba, Porto Alegre and Philadelphia programs is presented in section 5, which precedes the final conclusions.

2. SMART CITIES

Smart Cities is a field that has increasingly received attention from academia due to the richness of its literature and to its importance. However, it demands systematization of a knowledge that is still scattered and fragmented [13].

As a natural result of the development of an evolving field, there are different understandings of Smart Cities in different concepts, emphases and academic approaches. Research carried out by Nam and Pardo [16] lists several meanings of that domain according to the views of academics, highlighting elements such as technology, infrastructure and services; economy, population, governance, mobility, environment and life; efficiency, sustainability, equity and housing; monitoring and integration of critical infrastructure; City instrumented, interconnected and intelligent; culture, knowledge and motivation; ICT as a sponsor of freedom and accessibility to information and services.

Similarly, a large literature review has found that Smart Cities concepts were founded primarily in the following essential areas: smart technologies - focus on technology (23%); smart people - focus on human resources (8%); smart collaboration - focus on governance (12%) and combinations of the focuses mentioned (23%). In the remaining works, 33% of the total did not refer to any kind of definition [13].

Giffinger and Haindlmaier [10] developed an important approach that claims for six key characteristics to a smart city – smart economics, smart people, smart governance, smart mobility, smart environment and smart living – which combined constitute a model that allows us to evaluate, through indicators set by the authors, the performance of cities according to the smart concept [10]. Each of these characteristics encompasses factors showing the systemic understanding of authors, as described below [4, p.12]:

- Smart Economy - competitiveness as innovation, entrepreneurship, trademarks, productivity and flexibility of the labor market;
- Smart People - qualification or education, quality of social interactions regarding integration and public life and the openness;
- Smart Governance - political participation, services for citizens and functioning of the administration;
- Smart Mobility - local and international accessibility, availability of information and communication technologies and modern and sustainable transport systems;

- Smart Environment - attractive natural conditions (climate, green space etc.), pollution, resource management and efforts towards environmental protection and;
- Smart Living - quality of life as culture, health, safety, housing, tourism etc.

In order to build an understanding of the field from a systemic view and based on various approaches, Chourabi et al [6] developed a model with eight dimensions of smart cities critical internal and external factors, which has served as a reference in the matter. The model is composed of the following factors:

a. Internal factors: Organization and Management; Technology (organizational dimensions of ICT skills) and Governance (collaboration, leadership, participation, communication, accountability, transparency etc.)

b. External factors that influence the previous group: political environment, people and communities (digital divide, communication, education, accessibility, quality of life etc.), installed infrastructure (IT infrastructure, security and privacy of information and operational costs), economy and environment.

Consolidation and systematization of smart cities approaches (are necessary and can avoid) the risk of a superficial discussion involving the issue at the political level, as underestimating the potential negative consequences of technology use and infrastructure to make a city smart and the search for strategic solutions rather than any simpler operational solutions [5].

3. METHODOLOGY

This study follows a qualitative approach aiming at understanding the social world from the author's point of view [4] and it is based on the case study about the Call and Information Center 156 in the city of Curitiba (Brazil). The choice of this case study was made in an attempt to understand more deeply this social phenomenon by means of an exploratory research [21].

In December 2014, the authors conducted semi-structured interviews with Call and Information Center 156 Curitiba managers responsible for creating and operating the system. Each face-to-face interview lasted about one hour. Data was collected using the protocol developed by the multinational "Smart Cities Smart Government Research Practice Consortium" (SCSGRPC), that aims at exploring the processes of smart city Initiatives and their impact on cities, people, and city governments. The study by Chourabi et al. [6] provided the conceptual background for the interview protocol.

Secondary data taken from two studies by SCSGRPC members were used. Both studies were concerned with integrated service centers for citizens: one was the 156 service in Porto Alegre (156 Speaks Porto Alegre) and the other was the Philly311 service in the city of Philadelphia.

Interviews were semi-structured serving as a guide to the inquiry and dismissing standardized formats that could constrain interviewees [8]. Three professionals with extensive experience in the 156 Contact Center, who have held key positions within the structure, were interviewed. In this study they are called PR1, PR2 and PR3. A member of senior management of the municipal executive, designated as AD, was also interviewed in order to present the view of a professional linked to the information technology area involved in service management. The interviews were recorded, transcribed and later coded by one of the authors using the MAXQDA software, version 11. Thereafter, all the

authors discussed the data and analyzed comparatively the three cases.

4. CALL AND INFORMATION CENTER 156 CURITIBA

According to the municipality's website (see <http://www.curitiba.pr.gov.br/servicos/cidadao/central-de-atendimento-e-informacoes-156/1086>), the Call and Information Center 156 of Curitiba provides information and meets the demands of citizens by phone and the Internet and is focused on effective services delivery. It was developed and managed by the Curitiba Institute of Informatics (ICI), a third-party company.

4.1 Context

The city of Curitiba is the capital of the State of Paraná (Brazil), part of the Brazilian southern region, a set of three federal states of the Union. According to the Brazilian Institute of Geography and Statistics (IBGE), the organization responsible for statistics in Brazil (see <http://www.cidades.ibge.gov.br/xtras/home.php>), in 2014 its estimated population was 1,864,416 inhabitants, occupying in 2012 the 6th place among the 27 Brazilian cities in the item income per capita. According to IBGE, in 2010 it was the 4th Brazilian capital city with the highest Municipal Human Development Index (0.823).

Recognized as an innovative city, Curitiba was awarded in 2012 the first position in the Digital Cities Index Brazil by the Center for Research and Development in Telecommunications, CPqD. The index primarily considers public access to Internet and network coverage. The classification of 100 cities surveyed was based on three criteria: technological infrastructure, availability of digital services and accessibility features (see <http://www.computerworld.com.br>).

The Call and Information Center 156 is a service engaged in providing information and meeting the demands of the city population. It started operating in 1984 as a telephone line to receive suggestions and complaints by citizens. In 1999, seeking to improve the work and speed up the response to the citizen, the program underwent structural change in terms of organization and governance through a management agreement between the municipality and the ICI, which became responsible for the control and management of 156 (see <http://www.ici.curitiba.org.br/noticias/central-156-completa-30-anos/861>).

The ICI, manager of the 156 service, is a Social Organization (SO) focused on Information Technology in the public sector, for example, ERP and BI solutions in the State of Paraná with operations across the country. The organization controls, manages and owns the 156 service infrastructure and the city of Curitiba's ICT and, as reported by the PR1 interviewee, has a 60% share from the private sector and 40% from Curitiba's municipality.

4.2 The Origin of the Call and Information Center 156 in Curitiba

According to PR1, the creation of the Call and Information Center 156, in Curitiba, during 1984 resulted from the idea to relieve service counters. Initially the Call Center accepted demands involving public lighting, followed by garbage collection and gradually expanded on services provided, enabling the establishment of a workflow providing various city services. According to PR1, "we were taking each of these services here and qualifying them. At first, the aim was just to classify services, suggestions and complaints..."

Referring to the initial stage of the Call Center, PR1 recalled that the Call Center 156 "was born with this vocation to be a citizen service" and emphasized the concept of integrating city services. He reported that, after some problems, it was decided that citizens served by the Call Center 156 would have their demands met exclusively through that channel, regardless of the agency responsible for complying with such demands. The integration of services showed the city's efforts to increase its effectiveness, transparency, convenience and sustainability towards a concept of Smart City [17].

The ICI, created in 1998, took over the Call Center 156 the following year, which had been managed by the city until then. PR1 notes that the flow and mapping of service management processes were remodeled, so that the new management could be up to the challenge. He adds that "six major government departments were integrated then: transportation, municipal secretary of public works, department of municipal government, education department, the health and environment departments".

Concerning the service transition period, PR2 reports that until 1999 the citizen had to contact the call center to know the result of his demand, i.e. there was no return to the plaintiff. After the ICI took over, changes in flow and processes and the introduction of an information system were a significant improvement in service delivery, as ICT, through its potential to modify governmental structures enabled the delivery of better services to citizens [11]. In this sense, PR2 said emphatically: "Of course technology has helped a lot."

With regard to the refinement in the treatment given to citizens by the Call Center 156, PR3 mentioned the change in treatment levels in 2002 establishing referral levels of demand, due to noncompliance with demands, going up hierarchically by bodies responsible and that may even reach the Civil House. On the subject, PR3 states, "if a bulb had to be replaced in a period of five days, and that did not happen, I had to demand that from the person in charge. Now the demand is made by the system itself by email. If the demand is not met, I inform your immediate boss and warn him that you have these disputes. Every seven days the demand goes up a step till it gets to a hierarchical superior".

The Call Center 156 of Curitiba celebrated its 30th anniversary in 2014, and that may have strongly influenced the population to adhere to the program. PR1 attributed this adherence to the following factors: the credibility of the municipal administration during the launch period, the program stability and its capacity to efficiently meet the demands and the needs of citizens. This position is explained in PR1 statement: "What we observe with respect to demand fluctuations: the citizen uses this service and from the moment he realizes it works, he begins to use it more and disseminate this information in his community, and what delights the citizen at 156 is precisely this concern of the municipal government to give an answer, even if it is a negative one".

4.3. The Curitiba Contact Center in 2014

In AD's words, the Call and Information Center 156 "is a service of reception, classification and targeting of contacts." He affirms that he receives various manifestations and requests, including those not belonging to the jurisdiction of municipal government, such as, for instance, information regarding federal income tax, and predicts that "it is a very strong reference in Curitiba... if someone is in doubt about something, he calls 156".

This indiscriminate demand could be explained by the range of services offered, because, according to PR1, about 3,200 services

could be requested at 156. The services are diverse, as shown in the website: accessibility, animals, street layout, tree, collection, drainage, buildings, schools, inspection, street lighting, information, property taxes (municipal tax on urban property), ITBI (tax on real estate transaction), cleaning, municipal parks, final paving, squares, Citizenship Street, traffic lights, traffic signals, health unit and others (see <http://www.central156.org.br/>).

According to PR1, in operational terms there is a workflow that maps all procedures. As a request is submitted, there is an immediate coding and shipment to the Head of Customer Service in charge, an employee trained for the job that will handle the request. All departments are integrated with the Central and represented by an employee in charge, so that for a service to be completed there is an employee in charge of providing a solution to your request. PR1 says that in 2002 there were 2000 requests a day, but figures have tripled in 12 years, presently reaching the figure of 6,000 daily requests.

A positive point noted by PR1, which was just incipient in 1999, refers to reports that the system generates monthly containing statistics of various types, such as requests for information and demands, distribution by districts and regional (geographical areas bounded by the municipality) etc., which have been delivered to the City Hall. As PR2 points out, the volume of information that the call center receives daily highlighted its importance as a tool at the disposal of municipal management, representing a set of inputs available to the municipality management for immediately use by the BI (Business Intelligence) tool. Concerning the use of 156 information, it is worth mentioning that "this information is used for budget planning and review and followed by the mayor and secretaries in reports that explicit the priorities of society by district and region periodically. Projects are prioritized according to criteria such as relevance and urgency, impact on quality of services, population demand, degree of innovation, political feasibility and impact on the government plan [20]. "

According to AD, despite the technology invested in it, the Call and Information Center 156 is characterized as "monocall", i.e. 90% of citizens' contact with the center takes place by phone and calls are charged by operators and paid by the user. There are two million monthly visits to the site, and the remaining 10% are divided between an available chat line and recording messages on the site. One possible explanation for that is the difficulty to change people's habit of accessing the Call and Information Center by phone, a practice that has been part of their routine for thirty years, and make them use new ways of relating.

As far as responses to citizens' demands are concerned, the Call and Information Center 156 service receives, monitors and returns them as mentioned before. In this respect, the interviewee AD clarifies that because the ICI and the City Hall are separate entities, the Call and Information Center 156 does not address demands inside the town hall, which he considers a vulnerability in the process. He adds that sometimes due to weaknesses in the internal processes of the city hall, responses by the 156 service take time. Utility is one of the principles in an information model based on transparency; information is only useful when it is accessible, intelligible, easy to get and use. Following this criterion, late information would not be useful [7].

As to the type of demands received by the 156 service, PR1 reports that most are requests for information, which would represent about 65% of the total, leaving little more than a third for services. This emphasis on information demand greater training of attendants since the request must, as a rule, be dealt with in a first contact.

In order to provide service quality, the initiative followed two fundamental assumptions: employee training and service delivery control. Regarding the first item, PR2 highlights the problem of turnover due to strenuous working conditions since professionals deal with complaints during a considerable part of their daily journey. He also points out that there are volunteer dismissal programs due to economic and political crises. This constant turnover demanded training of new employees and professional development of old ones. PR2 refers to the subject by saying: "Imagine what it is like to have information about various topics from 31 departments. So it's a great challenge to requalify the team [...] So you do a mapping, take all the information on a subject, you qualify and train operators and then you're ready. It's there inside the organizational structure in the 156 system. "

PR3 informs that the process of service quality control occurs between employee and service flow, since there is a constant monitoring of the situation online. In order to make it effective, there is a verification of logged employees, an analysis of their professional conduct, monitoring of conversations and the possibility to pass on information to the attendant without the citizen noticing it. Another aspect of control turns to the analysis of service flow demand, which can determine the rescheduling of breaks in some circumstances.

Taking into account that the service level agreement refers to "an agreement between the provider of the service and its customers, which quantifies the minimum quality of service that meets the business need" [19], Curitiba Contact Center has another control mode called "work hidden citizen". This monitoring is done by a professional who makes certain types of questions, previously defined, and evaluates, through a specific template, the service provided. Each month at least two subjects are checked. All monitors ask the same questions and attendants' evaluation is performed based on the correctness and clarity of information, whether it was complete, on the politeness and security of the attendant in addressing the issue and on time elapsed in attendance, which are all later compared to set standards.

Yet another feature of the service is the constant search for information about what is taking place in the city in order to be prepared for certain events, as states PR3. Therefore, the 156 Center has a professional in charge of seeking for new events in the city and passing information on to be included in the initiative database. According to an interviewee, "...the 156 service is a thermometer of what happens in the city. This has an immediate impact. If there is heavy rain, a street demonstration... it is here in 156". This search for information, and a further focus on staff training and central structure following an excess in demand meets the assertion that emergency information serves as alerts that can be targeted to the right people and that proactive services represent a feature smart cities [2].

Concerning results transparency, interviewee PR1 reported that the data are passed on to the relevant department and to the municipal government. When asked about the transmission of information to the population, he said that communications department advisors usually act as a data broadcast channel, so this is not the 156 service's responsibility. In addition, data gathered are posted in the city's website.

AD, the interviewee linked to the technological area and member of the senior management of the municipal executive, has some objections to the Call and Information Center 156 that disagree with subliminally positive approach of respondents who held prominent positions in the initiative. His greatest restriction on the Call Center, and also on ICI itself, concerns the governance issue. In fact, his

questioning goes even further to discuss the informatics technology policy of the city, the context in which the initiative operates. Initially he explains the origin of the relationship between Curitiba and the ICI; then he adds, "Curitiba, 15 years ago, decided to organize the informatics department into a computer Social Organization, which is a private entity outside the administration to perform all ICT activities in the City Hall through a management contract. So there is a contract that sets out the conditions that the city should fulfill for the ICI to run all ICT activities".

AD believes that it is positive that a private organization, not subjected to typical bureaucratic obstacles in public administration, has greater agility and flexibility in finding solutions. On the other hand, the performance in this area, especially in services such as the 156, should demand the presence of two fundamental requirements: transparency and control. As a top executive of city municipality, he affirms: "So today, I do not have this sorted out". He adds that the fact that the entire infrastructure and technical expertise and the Call Center 156 are in the hands of an external organization makes the city a hostage of the entity.

With regard to the infrastructure installed by ICI at the disposal of the city hall, AD considers it "reasonable" although insufficient for a city with the intention of becoming smart. In addition, he adds that due to lack of material resources he cannot implement policies, such as the creation of a single database of citizens, which would allow the 156 service to identify all the background of the citizen being served. He states that some of the databases are outdated and that the prioritization and targeting of Curitiba Institute of Informatics (ICI) turned to financial interests: "the ICI has maximized profitability of some systems". On this authority gap of municipality, the interviewee states "it is the ability to set policy, to set action plans, a process of priority setting, identification of needs and opportunities of using technology, to be able to hire and manage contracts. That the city has not created, on the contrary. When the ICI was created, more and more stuff was delegated to it".

In order to correct this distortion, AD defends the creation of a new governance system in which the city manages infrastructure, not in terms of data center installation or operation within the physical structure of the city hall, for example, but by giving the local authority the effective management of its ICT area, so that it can create policies, establish guidelines and determine the implementation of actions following certain lines. As a solution to what the interviewee considers a distortion, the project "Curitiba, a smart city" seeks primarily to change the form of ICT governance in the city.

5. COMPARATIVE ANALYSIS

This study presents a comparative case study between three non-emergency contact centers in two Brazilian cities (Curitiba and Porto Alegre) and in an American city (Philadelphia). We also have interviews data from the contact centers in Brazil, some of which already presented in this paper and, from Porto Alegre, presented by Azambuja et al.[3]. Concerning the American city, we have used Nam et al. studies[18][14], which used the Chourabi et al [6] dimensions to analyze Philly 311.

The eight components of a smart city developed by this group are: technology, management and organization, governance, policy, people and communities, economy, built infrastructure, and natural environment [6]. In the present study we used these critical success factors as the basis of the analysis of our findings.

The tables below are not exhaustive, listing common attributes to the initiatives, interesting remarks and certain strengths or

weaknesses of these services to citizens. CTB is used here to refer to the Call and Information Center 156 (Curitiba), POA to refer 156 of Porto Alegre, and PHI to 311, Philadelphia (US). The eight smart cities factors, worked by Chourabi et al [6], are listed below and a comparison between the three cities studied is drawn here.

I - Management and Organization

Human Resources Development	
a.	Initial training of 30 days and constant recycling (CTB);
b.	The new employees must be able to use e-mail, requiring heavy investment in training (POA);
c.	Program for internal customer service training of all city employees (PHI)
Integration	
a.	All municipal systems are integrated (CTB)
b.	System created an approximation between secretaries and agencies (POA)
c.	The information Philly311 provides to other departments is driving internal business process changes (PHI)
Weaknesses	
a.	Turnover and delay in deliveries of certain requests (CTB)
b.	Not all agencies are integrated yet; difficulty to 'manage' other agencies (service executors), because the demand is directly routed to the responsible agency and human resources (POA)
c.	Limited funding, under-staffing, and the change in organizational culture (PHI).

As for training, the information provided shows relative similarity between the center of Curitiba and Philadelphia, with structured training policies. However, in Porto Alegre there are problems in the qualification of employees, although human resources apparently represent a common problem in all analyzed initiatives.

II - Technology

Strengths	
a.	Public management system of 26 applications that integrate (CTB)
b.	Integration between agencies (POA)
c.	We are the only agency-level centralized database (PHI)
Weaknesses	
a.	Difficult to keep up with all the demands of technology and upgrade; main system is technologically outdated (CTB);
b.	System Limitations and slowness and requestor can not access request details - need to call and ask about the progress (POA);
c.	Under-equipped conditions and the lack of interoperability (PHI).

As shown in the table above, Philly presents a serious problem in the operation of a call center, which is interoperability, an important requirement for effective service. In Porto Alegre, besides a

deficient system, it is up to citizens to investigate the progress of their demands. The 156 service of Curitiba, in turn, needs to update the core system.

III - Governance

Strengths
a. Autonomy of decision (to ICI) to be a strategic project (CTB)
b. Interdepartmental collaboration (POA)
c. Leadership of the top management, executive support, organizational learning, and staffing (PHI)
Weaknesses
a. In governance (the necessary structure to achieve a desired future) the city has nothing; (CTB)
b. Service executers (other agencies and departments) are not subordinated by the 156 service (POA)
c. Philly311 does not have a formal governance body for organizing new interdepartmental collaboration and cooperation (PHI)

Governance is the greatest fragility factor regarding the 156 service of Curitiba. In fact, the problem lies in the relationship between this initiative with the municipality. The underlying discussion involves outsourcing of a strategic service for the population and for the city management to be run by private companies. The discussion in Porto Alegre turns to the relationship of the initiative 156 Speaks Porto Alegre and service providers, and Philly311 service is concerned with the lack of a formal cooperative relationship between central and county.

IV - Economy

a. Use of information to perform strategic management (CTB)
b. Reduce expenses (remove a falling tree avoiding damage) (POA)
c. Philly311 also enables the City Council (the city's legislative body) to use their resources more effectively, by saving their budget and staff time spent on providing constituent services

Considering primarily the benefits, the factor economy manifests itself in two ways: (a) in an indirect way, based on the information for managing the city strategically, enabling better resource allocation and, as a consequence, saving money, and (b) directly by mitigating damage and potential risks.

V – People and Community

a. CTB - 65% information to 35% of demand for services; conducting a survey with good results and tariffed telephone service to the user;
b. POA - You do not know the user's profile; no satisfaction survey and tariffed telephone service to the user;
c. PHI - Through integration of channels for municipal services and information, Philly311 is seen as a main gate to residents, businesses, and visitors of the city; toll-free phone line

While the Call and Information Center 156 in Curitiba stands out in the assessment by its users and Philly311 is seen as the citizen's portal and it was a toll-free phone line. In Porto Alegre weaknesses were pointed out with regard to the relationship with citizens.

VI – Political context

a. The ICI practically defines and organizes the 156 service strategy (CTB).
b. Political mandate has a deep influence; current government showed interest and recognized the importance of the service (POA)
c. Mayor's strong political and administrative leadership was found to be critical to build city-level service integration capabilities (PHI)

Unlike other centers where the strength of political context and in particular of mayors appears clearly, in Curitiba the decision-making process has been for more than 15 years in the hands of the outsourced entity responsible for the service. However, since 2013 the current administration has been working to change this situation, having created the Municipal Secretariat of Information and Technology, which has worked in the city's IT Governance.

VII - Infrastructure

a. ICT infrastructure is outsourced (CTB)
b. 156 has the infrastructure needed to integrate services, but the executers do not (POA)
c. Integration of technologies such as CRM and GIS software is essential to 311 service report and tracking as well as service delivery (PHI)

Again the issue of the Call and Information Center 156 service being outsourced in Curitiba and also covering the city's IT infrastructure reappears. In Porto Alegre, the weakness of integration is evident in administration, which fail to meet the demand.

VIII - Environment

a. The population in Curitiba is very concerned about the environment. The graph helps to identify the location of the problem (CTB)
b. This initiative helps to protect the natural environment - a channel to claim for services (POA)

Both concerns involve an aspect of great importance in public management: social control. In Curitiba, The 156 service is used as a channel to monitor a major concern of the population. In Porto Alegre, the contact center was used as a response to citizen complaints by the public city management.

6. FINAL REMARKS

This study focused on the Call and Information Center 156 in Curitiba, carried out based on semi-structured interviews, and later compared it with similar initiatives in the cities of Porto Alegre (Brazil) and of Philadelphia in the USA. Some final considerations can be listed specifically regarding the Curitiba's Contact Center, as a manifestation of smart city in the dimensions of the framework Chourabi et al (2011):

Management and organization – the focus is stakeholders' identification strategies; for dealing with all social segments of the population; the effective communication and; the training provided to the workforce, whose performance seems to meet citizen needs.

Technology – the big gap refers to the organizational level of collaboration between the two organizations (ICI and Curitiba City Hall), once knowledge has been restricted to the services provider and the contractor is slowly increasing IT management in the city.

Governance - reflects more acutely the problem of technology, since the city of Curitiba, which is responsible for setting the city guidelines, until recently did not have powers to directly support such policies and depended 100% on an external entity (ICI) for this purpose. On the other hand, the analysis of the reports provided by the third party organization to manage the Call and Information Center 156 in Curitiba can be considered of great importance to the management and planning of the city.

Political context - a public initiative which has been in practice for so long and has gone through several administrations even of different parties is seen as having reached its institutionalization and legitimacy within the political context.

People and Communities – its emphasis is on the relationship with citizens, availability of information, ease of access and on quality of life since it seeks to facilitate people's daily life.

Infrastructure - according to city officials, the infrastructure in the field of ICI, although reasonable, is not at the level to have a smart initiative.

Economy - the analysis of activities performed by the Call and Information Center 156 in Curitiba can be of great use for handling the needs of the population, which can have a positive impact in terms of making the city's economy more attractive city for investment, allowing the adoption of preventive policies, etc.

Environment - environmental issues and their consequences for the population are also part of the 156 service portfolio.

In reviewing this case from Giffinger and Haindlmaier's perspective [10], two important factors, not explicitly addressed in the previous model, arise. The first one refers to smart mobility, which is strongly supported by information provided by the 156 service and seen as one of the most wanted by the population. The second factor regards smart living, where again the central service stands out for its utility and public value delivered to the citizen.

The comparison between the cities has shown that Porto Alegre is apparently weaker in service delivery and, furthermore, the service user profile is not known due to lack of integration with service executors, slow systems and low-skilled workers. Philly311 has shown to be on a relatively high stage; however, it has interoperability problems, lack of personnel and of IT infrastructure.

In the case of the Call and Information Center 156 in Curitiba, the service provided has been evaluated positively by users and apparently has met the demands of the population. On the other hand, outsourcing management is one of the main weaknesses of the initiative. The city has had a low level of management in the 156 service of Curitiba and has not had the control of the technological infrastructure of the city for over 15 years. In other words, it slightly dominates a very important initiative for the population, for management and planning of the city, becoming hostage to a private entity, created to collaborate, but which has gained independent legal personality and administrative autonomy.

Besides comparing various service centers for citizens, it was the purpose of this paper to understand in depth the Call and Information Center 156 in Curitiba service as a smart city initiative. One limitation of this study was the fact that the interviews

remained restricted to professionals directly linked to the initiative and to the municipal executive, but other relevant sectors and directly related parts (e.g. citizens) were not investigated. Another limitation was the use of secondary data to carry out the comparative study of the initiatives. Further research on the topic should involve other stakeholders, such as users, press, political situation and opposition, as well as use of primary data through interviews or on-site research, and the study of related initiatives in other municipalities.

Finally, it is worth mentioning that the initiative of the Contact Center of Curitiba, which is being used for over thirty years and is now part of the city's routine, despite being supported by a "reasonable" technology, has apparently met the needs of the citizen. Its features strongly resemble a smart initiative and, once the sensitive issue of governance of the initiative is addressed, it will be consolidated in its full smartness.

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