

Key drivers for public value creation enhancing the adoption of electronic public services by citizens

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Abstract

Purpose – The relationship between citizens and government has been gradually changing from government centered to citizen centered. These changes can be understood from the public value perspective, which is a promising way to foster the use of electronic services (e-services) by citizens. The purpose of this paper is to analyze how key drivers for public value creation can enhance adopting electronic public services by citizens. The use of e-services as a basis for applying smart technologies is also discussed.

Design/methodology/approach – A qualitative study based on both a systematic literature review and a case study of an e-service provided by a Brazilian state government.

Findings – The study identifies that creating public value happens only after adopting e-services and that public value can be perceived directly by those who use the service or indirectly by the observation of people who have adopted it. A two-dimensional framework showing the direct and indirect factors that drive public value creation is proposed based on the data collection and literature review.

Research limitations/implications – The proposed conceptual framework remains untested and the data collection in the Brazilian context might be a limitation. Other studies could gather data based on the collective uses of e-services.

Originality/value – The framework can be used in other studies concerning public value creation. Public managers might consider its drivers when planning e-services as a way to link them to social, political and collective issues in addition to smart technologies.

Keywords Drivers, Public value, Key drivers, Electronic services, Electronic services adoption, Public value creation

Paper type Research paper

1. Introduction

The story of e-government (e-gov) is at the threshold of a new stage: lowering costs is still an important attribute in service delivery, but adding public value has been assumed to be its main goal (UNPAN, 2016). The use of electronic public services (e-services) is currently a relevant issue (Lindgren and Jansson, 2013). However, we still do not know enough about the impact and results associated with e-gov projects to foster a real organizational transformation (Luna-Reyes *et al.*, 2012). In addition, the low adoption of e-services by



citizens shows that they are not receiving the benefits from the investments, and therefore the government is not being efficient (Al-Hujran *et al.*, 2015).

The analysis of the positive or negative effects of information and communication technology (ICT) in the public sector should focus not only on the economic impact and individual choices typical of the private sector, as suggested by the New Public Management (NPM) approach, but also on the social and political dimensions and collective preferences, as indicated in the public value paradigm (Cordella and Bonina, 2012). This leads to a growing interest in understanding and establishing the value and impact of e-gov investments, especially by investigating the factors that help to increase the use of e-services not only from a theoretical perspective, but also from a managerial one. It is also important to understand when and under what circumstances citizens adopt e-services (Gupta and Suri, 2017).

On the one hand, there is a paradox in adopting e-services provided that even after two decades of investments the evidence for adoption impacts is still weaker than expected (Savoldelli *et al.*, 2014). In the Latin American context, much research must still be performed regarding delivering digital services (Criado and Gil-García, 2013). Especially in Brazil, which is ranked 51 in the United Nations e-Government Development Index, the Brazilian Government needs to improve its capacity to understand and stay aware of the values and necessities of Brazilian citizens. Service delivery remains a challenge for underdeveloped countries, and the regional distribution shows a growing disparity (UNPAN, 2016). On the other hand, smart technologies such as Blockchain (Olnes *et al.*, 2017) and artificial intelligence (AI) (Sun and Medaglia, 2018) might offer innovative resources needed to support new modes for producing public services either based on manufacturing or service logic (Cordella and Paletti, 2018). Related to the cost-effective and convenient means, smart technologies could be seen as a relevant tool to promote openness and transparency and to reduce corruption (Gil-García *et al.*, 2016). When these technologies are associated with innovation strategies in the public sector, which has been called smart government practices (Savoldelli *et al.*, 2014), they could result in effective changes for the implementation and delivery of public services provided that they create public value (Gil-García *et al.*, 2014).

Despite its great potential benefits for government, public administration and citizens, there are few research approaches addressing key drivers for public value creation in e-services, especially in a smart technology context. Furthermore, the vast majority of studies that address the public value paradigm focus on the individual and some of them on the implementation of smart technology, neglecting collective preferences and the key drivers for public value creation. To fill in this research gap, this paper seeks to analyze how key drivers for public value creation can enhance the adoption of electronic public services by citizens. The theoretical foundation is under the lens of the public value paradigm. In the present study we have viewed public value in electronic services as the value produced by governments that is perceived by citizens and created with the adoption of digital services (Lopes, 2016). A conceptual framework was defined based on Savoldelli *et al.* (2014) and complemented by an analysis of 127 scientific papers. Subsequently, a qualitative case study concerning the government of the state of Rio Grande do Sul in the south of Brazil was performed. A total of 46 interviews were conducted with citizens, service center clerks and a government manager who uses a specific e-service.

The results of this research can contribute in a valuable way toward public managers addressing the socio-political complexity of the impact of e-gov to deliver better e-services to citizens. This paper also aims to contribute to the discussion about managerial issues faced when implementing smart technology and also to address limitations and challenges of smart technologies for creating public value.

The remainder of this paper is structured as follows: in the next section, we discuss the relationship between smart technology and its public value. Then we describe the procedure of the systematic literature review that was performed and the process to identify a theoretical framework from the literature. Based on these elements, we developed a conceptual framework that includes some categories from theory and also from our empirical study. Section 4 presents our findings while Section 5 discusses our results. Finally, we discuss our major findings and present implications for research and practice.

2. Smart technologies and the public value

Having identified e-gov trends, Criado and Gil-García (2013) foreshadowed the use of smart technologies in government stressing the importance of evaluating their impacts on policy and public administration. In particular, the authors focused on social media, cloud computing, Big Data, among other topics.

Big Data (Bertot *et al.*, 2014), the Internet of Things (IoT) (Wirtz *et al.*, 2018) and AI (Sun and Medaglia, 2018) are particularly important trends in advancing e-gov. These tendencies both enable the advance of electronic and mobile governmental services and give rise to new questions about the transformation in the interaction between individuals and the government (UNPAN, 2016). The IoT, involving devices connected and shared through networks, will have a significant impact upon society (Hoe, 2016). This impact includes governance itself in addition to government processes. An increasing number of governments have recognized the potential of analyzing Big Data to support decision-making processes related to complex and interdependent issues. The benefits of Big Data analysis in policy integration and integrated service delivery can be both significant and tangible (UNPAN, 2016). In this context, data can become a strategic asset (Hoe, 2016). Similarly, AI can provide algorithms and techniques to transform data into learning and knowledge while giving support to developing new public e-services.

Given the variety of applications and settings, the huge spectrum of technologies and the different types of data exchanged, smart technologies are characterized by extreme complexity that demands the implementation of efficient electronic governance. In this connection, it is important to analyze adopting electronic public services by citizens from the paradigm of public value. The implementation of e-services is considered as fundamental to e-gov programs and should therefore be incorporated into any definition of electronic government (Gil-Garcia and Luna-Reyes, 2006).

However, although there has been an increase in the supply of e-services, their adoption remains limited, especially in developing countries. Whereas in the member countries of the Organization for Economic Cooperation and Development an average of only 50 percent of respondents (internet users aged 16 and over) use e-services, the adoption rate in developing countries is even lower (UNPAN, 2016). In the Brazilian case, the ICT Households 2016 Survey, a study based on interviews throughout the country with over 20,000 households, indicated that 61 percent of the respondents, or 57m Brazilians, had used e-gov. These data reflect the current e-gov situation in Brazil. Although citizens often use government websites to search for information, only a small part of them contact the government directly through social networks, government websites/e-mail or obtain services completely via the internet (CGI.br, 2017).

The effectiveness of e-gov initiatives is highly dependent on citizens adopting and using e-services (Al-Hujran *et al.*, 2015). To better understand the complexity of the transformation of the relationship between citizens and the state, such effectiveness must therefore be analyzed within the context of the public value paradigm (Cordella and Bonina, 2012). By incorporating social and political impacts, which are vital to adopting ICT in the public sector, this paradigm facilitates a superior understanding of the consequences of ICT in the public sector and alters how e-gov should be evaluated

(Criado and Gil-García, 2013). The public value perspective is observed as a contemporary alternative (Stoker, 2006) or reaction to the NPM paradigm (Rose *et al.*, 2015). This is because the rationale of NPM originates from the private sector, which considers citizens as clients. As such, it runs the risk of ignoring the democratic values of impartiality and equality and thus insufficiently values citizenry (Rose *et al.*, 2015). It also focuses on the individual, not the collective preferences considered by the public value paradigm (Zhang *et al.*, 2015).

Moreover, we are considering that citizens are the main stakeholders who define public value and, at the same time, receiving the e-services (Hui and Hayllar, 2010; Karunasena and Deng, 2012). We understand that citizen perspective is a relevant feature that should be considered in the public value concept by its very nature. Besides, smart technologies seem to have a special role in the interplay between government and citizens by defining the context for the public value creation, enhancing the co-creation of public services. However, in a post-NPM approach there is a lack of studies that analyze key drivers for public value creation. So, we address the following research question:

RQ1. How can key drivers for public value creation enhance the adoption of electronic public services by citizens?

3. Methodology

This study takes a qualitative approach, is descriptive-explanatory in nature and applies the public value paradigm. It involves a systematic literature review and a case study of an e-service provided by the government of Rio Grande do Sul (Brazil's southernmost state) using both primary and secondary data sources. Additionally, direct non-participant observation was used to complement the other data.

A systematic literature review was performed to better understand the phenomena studied in addition to identifying a theoretical framework from the literature. The theoretical model in turn provided conceptual support for data collection in addition to a basis for developing a conceptual framework from analyzing the data collected.

The electronic scheduling service for obtaining an identity card was chosen as the case study based upon convenience because it is performed in person and it allowed access to the citizens who used this e-service.

3.1 Systematic literature review

A systematic literature review was performed in the Web of Science database over all dates of publication up to 2015, which indexed 127 peer-reviewed articles published in scientific journals, and its analysis facilitated defining categories, variables and the analytical focus to help develop the research approach.

In order to create a significant foundation of the public value literature, our first search focused on publications that present conceptual public value (keyword: "public value"), leading to a total of 127 search results. To integrate a more practical perspective on the topic, we also searched for publications dealing with public value in connection with e-gov (keywords: "public value" and "e-government"), leading to 15 search results. We have read the full-text of these papers and the most mentioned papers, totalizing 26 papers[1]. To complement our relevant set of public value, we further scrutinized the list of references of these publications by means of a snowballing approach and also searched the Google Scholar database, which yielded 48 additional studies that had not come up in the initial database search.

Based on the systematic review of the literature, the Savoldelli *et al.* (2014) model was identified as the preliminary theoretical model for this research. This model was regarded by its authors as "Key-drivers of e-government adoption and public value production" and

was used as the main theoretical basis for this study. As discussed below, the systematic analysis of the literature also identified the factors, the relations between factors and the variables for the analysis.

3.2 Data collection and analysis

The data collection was conducted between September and October 2016 through individual semi-structured interviews and direct observation at three government service centers in the state of Rio Grande do Sul. A total of 46 complete interviews were performed, of which 31 were with citizens and 15 with service center clerks and government managers. Among the citizens, it was necessary to interview both adopters (16) and non-adopters (15) of e-gov to determine the reasons behind each choice. These reasons inform the drivers of public value predefined as an analytical category (Table I). Only those non-adopters who were aware of the e-service were interviewed because awareness of e-service is an obvious precondition for choosing whether to use it. The citizens were chosen and interviewed in the field with prior permission of the general and local coordinators of the service centers. Among those interviewed, 47 percent were adopters, whereas 44 percent were non-adopters; 48 percent were male and 52 percent were female. They were distributed homogeneously across six different age groups and three levels of education. In addition to citizens, different profiles of managers and service center clerks were identified.

This study used content analysis of the 332 pages of the transcribed interviews to perform the categorical analysis. The coding process was performed in three stages,

Category	Concept adopted	Variables	References
Collaborative process	Process of dialogue with society, citizen collaboration in the design and delivery of the e-service and citizen empowerment	Dialogue with society Collaboration Citizen empowerment	Karkin and Janssen (2014) Rhodes and Wanna (2009) Hui and Hayllar (2010) Alshibly and Chiong (2015) and Arnstein (1969)
Governmental readiness	Citizens' perception of the government's level to be ready to collaborate with citizens	Governmental transparency Collaboration readiness	Hung (2012) Karkin and Janssen (2014) Hilgers and Ihl (2010)
E-service design	Aspects related to the project, conception and design of the e-service until its effective delivery from a citizen's perspective	User orientation Ease of use Usability	Al-Hujran <i>et al.</i> (2015)
Citizen trust	Trust in the government departments that provide public services, as well as trust in the electronic channels through which the services are provided given that these levels of trust are needed to encourage the use of e-services	Trust in the technology Trust in the government	Al-Hujran <i>et al.</i> (2015) Bélanger and Carter (2008) Chen <i>et al.</i> (2015)
Creation of public value	Aspects related to creating public value by adopting e-services	Convenience Service experience Attitude	Al-Hujran <i>et al.</i> (2015) Karunasena and Deng (2012) Osborne <i>et al.</i> (2016) Alshibly and Chiong (2015) Al-Hujran <i>et al.</i> (2015)

Table I.
Content analysis categories

resulting in 65 coded sections. The coding categories, their associated concepts, the analytical variables and the source references are presented in Table I.

One of the authors performed on-site interviews and at the same time a non-participant carried out direct observation for obtaining the primary data. The main objective of this observation was to understand the citizens' perception related to their experience and the creation of public value in the final step of the e-service. Through triangulation, data analysis allowed to make a comparison between the theoretical inputs from the literature review and the empirical data regarding the perception of citizens and the government team. Subsequently, the critical analysis of this data facilitated the development of a conceptual framework, which is presented in the discussion section.

4. Findings

4.1 *Relevant aspects to the public value dimension drivers*

Although technology adoption from a user perspective has been extensively studied, there are relatively few studies that focus on the adoption of e-services in government. Besides, not many of them deal with aspects such as “when” and under what circumstances citizens adopt an e-service. Therefore, it is necessary to understand in more detail which factors help to extend the intention to use not only from a theoretical perspective, but also from a managerial and empirical perspective (Al-Hujran *et al.*, 2015). In our research, we adapted the Savoldelli *et al.* (2014) model regarding the public value key drivers and combine it with our findings.

4.1.1 Collaborative process. When delivering services to the citizen and simultaneously creating public value, the government can obtain new ideas through citizen collaboration (Hui and Hayllar, 2010). This process was regarded as collaborative, and as identified by our research, the positive perceptions of the citizens interviewed led to obtaining their ideas and suggestions for improving the e-service. Even non-adopters were supportive, thereby bolstering the assumption that willingness to cooperate is not solely dependent on individual benefits, but also emerges when the benefits of collaboration are collective in nature. The sense of justice and the common good, as well as collective – as opposed to individual – values, are typical of public value (Alford and Hughes, 2008) and were expressed by citizens who said “everyone has pretty much the same ideas, right? [...] on the one hand for the common good, for collective use” (C26-NA) and stating that “because it will help other people if they listen to you [...] if they make these changes, it could improve things greatly” (C20-A).

The public administration interviewees were also enthusiastic about receiving citizen input and to implement external suggestions. In particular, the staff of the service center involved with public dialogue and collaboration stated that they had already implemented several ideas received from citizens. Additionally, empowerment was observed by citizens as important for building the collaborative process. Several such indications were made by the citizens and examples include the following: the happiness of being able to help (C18-NA), to contribute to improving something (C9-A), to think of others and not only about themselves (C10-A), to feel respected (C21-A), a sense of fairness (C28-NA), one's vote making a difference (C15-NA) and feeling that you are impacting the system (C19-NA).

It is also necessary to emphasize the sense of passivity of non-adopters. The lack of skills to use technologies was identified as one of the reasons for being non-adopters. On the other hand, the package of different interaction mechanisms instituted (chat, ombudsman, telephone, “contact us”) was considered to be a result of this collaborative process. These led to governmental support and allowed government service centers to directly respond to citizen requests. In addition, the mechanisms themselves are part of the e-service design, which are factors that indirectly contribute to e-service adoption.

4.1.2 Governmental readiness. There is a need for government actors to be receptive to creating new ways of allowing citizens to collaborate in the design and delivery of public e-services, creating collaboration readiness. An interviewee stated: “[...] it is critical that government increases its responsiveness and listens to its citizens because all services are targeted at them.” Echoing this idea, an interviewee stated: “[...] the population needs to be heard because they know what is and is not working” (C23-A).

In the case study analyzed here, the interviewees regarded the chat tool as providing the greatest sense of readiness by the government. Besides, it provides a direct contact between the citizens and their government. Some citizens consider the lack of a human interface to be a negative aspect of e-gov transactions (Alshibly and Chiong, 2015). In Brazil, where the culture highly values interpersonal relationships, the “chat” feature has proven to be an interesting tool to fill this gap.

In general, the study identified that the citizens interviewed had a significant perception of the relevance of the government’s open-mindedness. For instance, C8-A explained the importance of giving a voice to the citizen, increasing the level of citizen trust in government, and strengthening the collaborative process, as follows: “[...] because we want to collaborate with the government, and if we are listened to, we will collaborate even more so, and the government will thus show greater transparency.”

4.1.3 E-service design. In this study, we obtained significant evidence to indicate that the design of the e-service is a key driver of its adoption. Some respondents mentioned the importance of usability and ease of use: “Very easy to use. You enter your ID number and the system asks if you want to schedule an appointment and what documentation is needed. It is very easy” (C2-A).

The simplicity of the system was also mentioned: “[...] a very easy service to navigate, which is really important! The government should make sure [...] that it is simple so that people can access the service easily [...] because if the site is very complicated, most people will not be able to access it” (C23-A). Many other interviews mentioned the ease of finding the e-service being studied.

In spite of the different barriers to adopting e-services in Brazil (CGI.br, 2017) such as digital exclusion and lack of ICT skills, some of the non-adopters interviewed understood their ease of use: “[...] for those who have access and know how to use a computer, I think it would be very simple to use this service” (C29-NA). The design proves to be one of the motivating factors behind the use of the e-service (Gjermundrød and Dionysiou, 2015) in addition to a citizen-centered service (Karunasena and Deng, 2012) and the need for the service to be of high quality (Kearns, 2004).

4.1.4 Citizen trust. The citizens’ trust in the government increases their willingness to collaborate (Meijer, 2015). It also increases citizen empowerment because the user feels in control and therefore has greater trust in government institutions (Alshibly and Chiong, 2015). In this study, trust was emphasized as the basis for citizen collaboration. Similarly, the adopters of the e-service being studied had a certain level of confidence in the technology itself. In many cases, the citizens showed that internet use is unavoidable despite its privacy and security risks.

On the other hand, the vast majority of non-adopters of this e-service do not trust the internet. Concern with the privacy of his/her data is evident in an interviewee’s statement (C28-NA): “[...] I believe that everyone is a little worried [...] but security is faulty [...] everything is in the cloud! These days everything is online, so there is no data security.” The view of this individual agrees with 47 percent of those interviewed in the ICT Households 2016 survey (CGI.br, 2017), which found that they had not used e-gov in the prior 12 months because they were concerned about the protection and security of their data.

In terms of trust in government institutions, which is an important source of public value (Kelly *et al.*, 2002), both adopters and non-adopters of the service in question indicated that they trusted in the government process: “[...] because I always trust the process because for every government appointment and service that I have needed, I’ve never had any hesitation about providing my data. I’ve never had any problems” (C11-A).

Table II presents the key drivers and the main findings related to them. Excerpts from interviews that illustrate some of these findings are also provided.

4.2 *Relevant aspects of the perception of the public value dimension*

Public value emerges from the benefits experienced by citizens using an e-service (Alshibly and Chiong, 2015). In other words, the creation of public value will only occur after the adoption of an e-service. This fact is backed up by our research because even non-adopters recognized its public value even if they had not experienced its actual creation. It is possible to distinguish the concepts between the “creation” and “perception” of public value. The data collected demonstrate, especially via the statements of non-adopters, that it is possible to perceive the public value of an e-service even without having used it. Thus, the perception of public value can occur through an understanding of collective benefits and not necessarily only through individual benefits.

Although citizens may perceive the public value of an e-service, there are barriers that prevent its adoption and consequently creation of public value. In our research, these barriers became clear mainly through the information provided by non-adopters. These non-adopters, despite having perceived the public value of the e-service being studied, did not adopt it because of a lack of ICT literacy skills, a component of the digital divide. Therefore, the barriers to adopting an e-service should be mapped and analyzed by the government (Meijer, 2015). When such barriers to adoption cannot be mitigated or removed,

Key drivers	Findings	Illustrative testimonial	Citizen profile
Collaborative process	Chat as a relevant dialog mechanism Need to increase the formal channels for collaboration Non-adopters feel less empowered	“[...] in elections, people only press a number, but they do not ask why and what reasons are behind pressing this number. Here, we are targeting the answers in a focused manner”	Non-adopter Female 25–44 years
Governmental readiness	Importance of channels for dialogue and collaboration for understanding public value Differentiating between channels for dialogue and those for collaboration	“There isn’t any point speaking to a closed door, is there? But, if it is open, you will continue speaking. But then, if the door closes, it does not help [...] so if there’s an open door, where you can provide your opinion [...] you will provide it”	Adopter Female 35–44 years
E-service design	E-service design is a relevant factor as a direct driver of adoption	“A very simple service to navigate, which is also important. The government should make sure [...] that it is simple for people to use. People should be able to access it easily because if the site is complicated, most people won’t use it”	Adopter Female 45–59 years
Citizen trust	Perception of the difference between the politician and the public servant	“The more we trust the government, the more we tend to collaborate because we feel more committed. When we see that the individuals, the department, or the institution are committed and are working hard, we commit as well and embrace the cause”	Adopter Female 35–44 years

Table II.
Main findings regarding the dimension “drivers of public value”

public sector managers should look for alternate means to reduce this digital disparity and therefore create public value (Cordella and Bonina, 2012).

The interviewees often mentioned the e-service's practicality and convenience, and this is relevant when analyzing the creation of public value. In the provision of public services, the characteristic of the production and consumption of a service occurring simultaneously is not always possible (Lindgren and Jansson, 2013). Very often an e-service must be completed in person, which is also the case with the e-service in question here. In terms of creating and perceiving public value, this renders the design of the e-service more complex and therefore requires greater analysis by public managers during its development phase.

Many of our respondents preferred to obtain the public service they needed in person. This was the reason they mentioned for not adopting the e-service being studied. Because it was not the focus of this research, the reasons for their preference are not clear from the data collected. One of the reasons from the CGI.br (2017) study is citizens' lack of confidence in e-services. Another could be related to cultural factors (Meijer, 2015).

Finally, the lack of dissemination by the government about the e-service was also mentioned by the interviewees as a reason behind their not using it. This factor, which limits e-service use, should also be considered when planning its implementation. Public sector managers should delve into understanding the level of citizen awareness about the value of adopting e-services (Al-Hujran *et al.*, 2015).

The main findings regarding the public value perception dimension are summarized in Table III.

5. Discussion

The starting point of the paper at hand refers to the paradox of adopting e-services and its high investments in search for positive impacts and efficiency in e-gov (Rose *et al.*, 2015; Savoldelli *et al.*, 2014). Based on the systematic literature review, we have verified that there is a lack of studies that analyze key drivers for public value creation. So, aiming to fill this gap we undertook a case study in the south of Brazil. With the data collection (interviews and direct observation), we developed a conceptual framework. It shows the antecedent causes for adopting electronic services (here called key drivers) and the creation and perception of public value. The framework is presented in Figure 1, and its elements are subsequently discussed.

The framework has two dimensions, namely key drivers of public value and public value. The first dimension is adapted from Savoldelli *et al.* (2014) and includes four key

Factors	Findings
Adoption of e-service vs creation of public value	Public value creation occurs only after the adoption of the e-service
Creation of public value vs perception of public value	Difference between the concepts of the creation and perception of public value
Adoption of e-service vs perception of public value	Public value can be perceived even without adoption
Barriers to adopting an e-service	Barriers can be seen as factors inhibiting the perception of public value
Creation of public value – convenience	Practicality as an attribute of convenience
Creation of public value – experience	Inseparability: generates greater complexity to the design of an e-service
Barriers to adopting an e-service	Lack of understanding of the “prefer to obtain (the service) in person”
Perception of public value	Lack of dissemination of the e-service as an obstacle to perceiving public value

Table III.
The main findings of the public value perception dimension

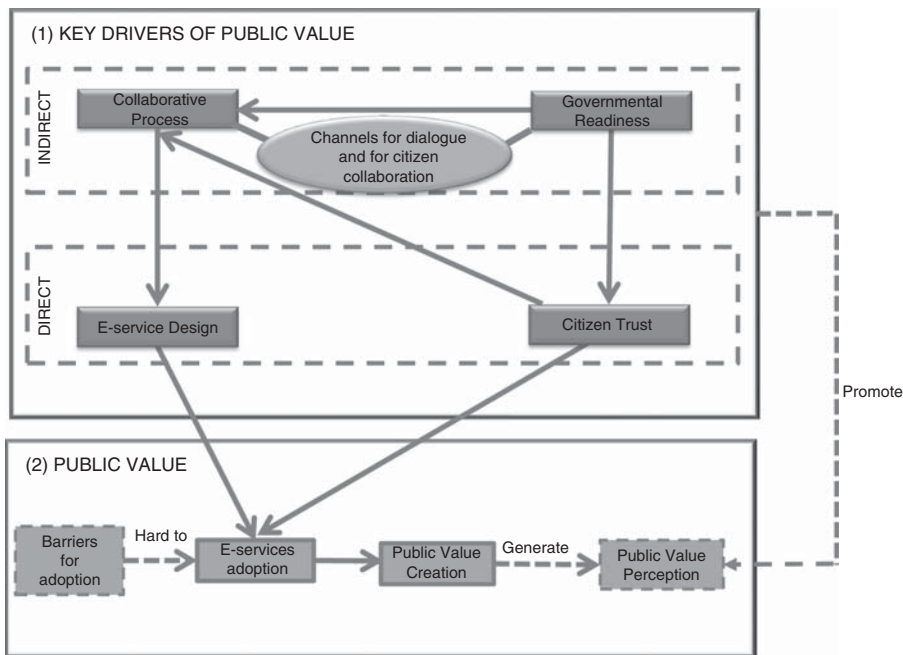


Figure 1.
Conceptual framework
proposed

factors for creating public value by adopting e-services: citizen trust, e-service design, governmental readiness and a collaborative process between government and service users (Kearns, 2004; Kelly *et al.*, 2002). The second dimension of the conceptual framework consists of how this public value is perceived, which is influenced by factors such as ICT literacy, lack of dissemination of e-services and preference for obtaining public services in person. In the first dimension, e-service design and citizens' trust can be regarded as "direct factors" because they are considered as direct sources of public value (Kearns, 2004) from adopting e-services. The collaborative process between the government and citizens and governmental readiness can be observed as "indirect factors" that depend on the existence of other factors to create public value.

The collaborative process relates to the dialogue between government and society, which leads to a better understanding of the needs of citizens and consequently their empowerment. This collaborative process is related to governmental readiness because it is influenced by the citizen's perception of the government being willing to collaborate. It is also related to the e-service design because the design itself can be influenced by collaboration with the citizens and reflects their vision (Al-Hujran *et al.*, 2015). The search by government departments for external inputs supports the public value of the service. This is because the latter allows for input from citizens regarding the design aspects of e-service delivery. However, it is difficult to implement effective services even when they are meaningful and desirable for citizens if they are not engaged (Rose *et al.*, 2015). Considering that e-service design is directly related to adoption (Hui and Hayllar, 2010), it was considered as a direct factor in the framework.

Governmental readiness is directly associated with the population's perception of how their demands are being incorporated. This perception influences the citizen's trust and also the citizen's perception of how the collaborative process of public service creates public value (Savoldelli *et al.*, 2014). Previous literature highlights that there is a need for

government actors to create new ways to enable citizens to collaborate in designing and delivering public e-services. In the case studied here, creating alternative mechanisms for interacting with users was a means of overcoming obstacles to adopting the e-service and creating greater inclusion in the collaborative process. These mechanisms can be divided into two categories: channels for dialogue, which are used to obtain information and clarify doubts (“talk with us,” chat and phone), and channels for citizen collaboration, which are used to evaluate the service and to receive suggestions and criticisms (ombudsman). Thus, the suggestion to public managers that cannot implement mechanisms focused on citizen collaboration is to identify other forms of improving the perception of public value (Meijer, 2015). However, the sense of freedom that the user has in terms of choosing between a variety of service delivery methods (Alshibly and Chiong, 2015), which is associated with the typically voluntary nature of choosing how to obtain a public service (Al-Hujran *et al.*, 2015), leads some citizens to continue to not adopt the e-service. Another important issue is the great receptivity by the citizens that the chat tools had in this case. Besides generating a sensation of greater readiness of the government, it is an internet channel that promotes direct contact between government and people. This aspect is in line with Alshibly and Chiong (2015) who point out that the lack of human interface is considered a negative aspect of e-gov transactions by some citizens. It also seems that chat can contribute to a Brazilian cultural issue where the interpersonal relationship is highly valued.

These dialogue and collaboration channels were also observed by the interviewees as means of establishing governmental readiness, even though many felt uncomfortable with the lack of human interaction in the service in question. However, the interviewees also understood that some of the tools (e.g. “chat”) overcome some of the necessity for human interaction in addition to being another means of listening to the people. It is clear that “giving voice to the citizen” is restricted to the e-service itself and not the government as a whole; however, the citizen sees this mechanism as way of willingness on the part of public management, which is able to receive suggestions and criticisms regarding the service being provided.

E-service design includes both design elements themselves and how the service itself is delivered. It is doubtless that a high-quality service generates the creation of public value either by it being offered through multiple channels or by innovation in terms of how it is delivered (Savoldelli *et al.*, 2014; Kearns, 2004), in addition to the quality of service’s design. Its attributes related to usability, ease of use, simplicity and ease of finding the e-service received special mentions by our interviewees. So, if citizens perceive government as trustworthy, they will increase their collaboration with it (Meijer, 2015). However, as Rose *et al.* (2015, p. 45) observed “[...] the online provision of a service in an attempt to reduce personnel costs incurred in over-the-counter service delivery does not automatically constitute an improved service to the public.”

In this manner, the relationship between citizen trust and the collaborative process can be analyzed. Citizen trust has been defined as a key driver for adopting e-services because many authors see it as a determining element for creating public value (Bélanger and Carter, 2008; Wang, 2014; Al-Hujran *et al.*, 2015). This has to do with the government’s credibility with its citizens as trust in government institutions is regarded as an important source of public value (Kearns, 2004). This key driver also incorporates the population’s trust in the electronic means of the service delivery (Alshibly and Chiong, 2015). Provided that the citizen’s trust is directly related to adopting the e-service, the creation of public value is observed as an underlying factor (Savoldelli *et al.*, 2014) and influences the collaborative process. In sum, citizens trust perception in government increases readiness for collaboration (Meijer, 2015) and also increases citizen empowerment, since the user has a sense of control and, therefore, greater confidence in government institutions (Alshibly and Chiong, 2015).

The second dimension of the conceptual framework proposed was termed the “public value perception.” Adopting the e-service creates public value. Moreover, the perception of public value happens after its creation and stems from the benefits that accrue to citizens by adopting the service (Alshibly and Chiong, 2015). Another means of perceiving the public value of an e-service can occur even when the public value created benefits others, such as when the citizen sees that collective benefits were created, even if they do not necessarily benefit him/her (Alford and Hughes, 2008). To this extent, e-gov could be perceived by the citizen as a collective benefit, even if he/she do not adopt or receive directly the benefit. However, if citizens do not engage and use e-services that are available, little efficiency impact will be achieved (Rose *et al.*, 2015).

Obstacles to adoption still remain, which can be regarded as factors that inhibit, limit or are reasons to not adopt the e-service (CGL.br, 2017). These factors should be incorporated into the conceptual framework because they diminish the creation of public value (Meijer, 2015). In our framework they are included as a “barriers for adoption” such as ICT literacy, lack of dissemination of the e-services, lack of transparency and participation and preference for personal contact. ICT literacy includes both critical cognitive skills and the application of technical skills and knowledge. These cognitive skills include general literacy, such as reading and numeracy, critical thinking and problem solving. Concerning the individual ability differences, someone may find it difficult to use e-gov services and governments must also bridge the digital divide among people (Tang *et al.*, 2009). In some situations, publicizing the existence of e-services is not sufficient for their public value to be perceived, even with the use of e-services. Similarly, citizens could always continue to prefer face-to-face services to electronic ones. In addition, this study also demonstrated the importance to the citizen of a quality design for creating public value (Savoldelli *et al.*, 2014). Likewise, it was also shown that the citizen clearly differentiates the public servant from the politician, which to some degree reflects his/her trust in the e-service being used.

Considering our conceptual framework proposed, it is important to link it in the context of smart technologies in government, particularly in developing countries such as Brazil. The greater use of applications involving sensors, wireless networks, cloud-based computing, smart devices, among others has dramatically increased the use of smart technologies and generated a significant and diverse set of data. Thus, when implementing the use of smart technologies in e-services, we believe that public managers should also consider their impact on creating public value. At the same time, policy makers should put the challenges in implementing AI and IoT in governments on their agenda and they must be prepared to manage the enormous quantity and variety of data that are produced by these smart technologies. Thus, when using a data-driven approach, it is suggested that the evaluation of the impact of the smart technologies consider the key drivers for public value that emerged from this study, which are systematized in the conceptual framework proposed.

The adoption of Big Data platforms by governments allows integration of interoperable data between different government agencies. It also facilitates detecting patterns and correlations that can support the process of dialogue, in addition to the co-creation and co-production of the e-service (a key driver of public value is a collaborative process). The data generated through a smart infrastructure, such as open data portals, can also boost the sense of citizen empowerment and promote the creation and perception of public value. Different smart technologies tools and applications can also increase the mechanisms for dialogue and citizen collaboration. Furthermore, the use of predictive and prescriptive data generated by smart technology tools and applications can also improve citizen collaboration mechanisms. To increase the citizen’s perception of the government level to be ready to collaborate with citizens (key driver for public value: governmental readiness) should be designed based on the ability to capture, store and manage data from a variety of sources, including smart technology tools and applications.

Simplification and ease of use of e-services can also be achieved using smart technology tools and applications, especially to improve the e-service design, which is a key driver for public value. Robots, for example, can be used to learn from the new data and adapt to different situations during the digital delivery of the service, resulting in the processing of new data (Hoe, 2016). Some conflicting issues should be discussed as for citizen trust being a key driver of public value and the use of different smart technology tools and applications. On the one hand, these tools and applications must ensure the security and privacy of user data to increase their level of trust in technology and government institutions. On the other hand, smart technologies are opportunities to increase governmental readiness, readiness for citizen collaboration and consequently the perception and creation of public value.

The challenges and risks posed by the implementation of smart technologies in e-services will necessarily require the development of an IT strategy and governance that considers creating public value. The conceptual framework proposed in this study could be a starting point for policy makers who wish to adopt this approach. We believe that smart technologies have the potential to improve the quality of public e-services provided to citizens. This would be even more so in the case when these smart technologies are viewed as increasing public value by a greater level of adoption by citizens. Thus, the low adoption of e-services can be transformed through by implementing e-gov strategies, especially when focused on a data-driven approach.

6. Conclusions

In this paper we posed the question: How key drivers for public value creation can enhance the adoption of electronic public services by citizens? In response we started a systematic literature review in public value creation finding out a lack of analysis using key drivers for public value creation. Thus, a conceptual framework proposal was developed based upon the Savoldelli *et al.* (2014) model and by doing a data collection in Brazil.

Our findings point to a possible perception of the public value of an e-service even when it is not adopted by all citizens. It should be noted that inhibiting factors such as the lack of ICT literacy skills and the digital divide, which are prevalent in developing countries, can negatively influence such perception. Furthermore, change in the government-citizen relationship has been one of the main goals of e-gov researchers, and in representative democracies, this relationship, which was initially focused on government, has gradually been transferred to society. The focus was to understand this process of change from the public value perspective. To do so, this study concentrated on identifying drivers of public value creation through citizens adopting e-services and on proposing a conceptual framework.

The results of the research show the inter-relationship between the key drivers for public value identified in relation to an e-service and then organized within a conceptual framework. One of the main findings of this research is that the creation of public value occurs only after adoption. This is because it has been found that without adoption, whereas the perception of the public value can be identified, its creation cannot. So, to implement an effective service that is desirable for citizens, their engagement is needed (Rose *et al.*, 2015). Our findings also show that perception of public value can occur as a consequence of a collective benefit perception, even if it does not have individual benefit. Moreover, the results show that the service design becomes more complex for purposes of creation and perception of public value and therefore should be studied by governments in the e-service design phase.

The network governance takes place when a service co-production occurs aimed to improve service performance and add value in terms of public benefit. Governments are developing open innovation policies to bring external partners with specific capabilities in order to integrate their contributions (Lee *et al.*, 2012). However, Hilgers and Ihl (2010) understand that citizen sourcing is a new innovation management strategy in the public sector. They demonstrated how disruptive the transition can be going from “few” to

“many” and being perhaps the most democratic idea. This means that individuals can have an important role in building the world they live in. However, in our research field (and also in the literature review), we can say that we are still in a placation level regarding degrees of tokenism (Arnstein, 1969). In conclusion, even with smart technologies available in the public sector and all its potential use, we are still far from the degrees of citizen power proposed by Arnstein (1969).

The results of this research can contribute to public managers as a valuable means of addressing the socio-political complexity related to the impact of e-gov in the public sector to deliver better e-services to citizens. This paper has also the intention of bringing contributions in the discussion about managerial issues faced to implement smart technology and also to address limitations and challenges of smart technologies to create public value.

The main contribution of this study is a conceptual framework that can be used to support the planning of e-services and the decision-making process during e-service implementation. We also highlight the context of our study that considers the regional Brazilian characteristics and can make it easier for public managers to understand the motivations behind adopting e-services.

The conceptual framework proposal remains untested and the data collection in the Brazilian context might be a limitation of this study. As such, it is suggested that future research should apply this framework by creating and validating hypostases in a larger context. In addition, we recommend that future studies seek to understand the reasons provided for preferring in-person services, which could be related to cultural preferences. Additionally, future research could seek to understand factors related to collective interests (not only individual ones) and the possible lack of dissemination about the e-service, which are questions that emerged in this study but were not further investigated.

Note

1. The Cordella and Bonina (2012) work appears in both groups, so we found 15 in the first group and 12 in the second group.

References

- Alford, J. and Hughes, O. (2008), “Public value pragmatism as the next phase of public management”, *American Review of Public Administration*, Vol. 38 No. 2, pp. 130-148.
- Al-Hujran, O., Al-Debei, M.M., Chatfield, A. and Migdadi, M. (2015), “The imperative of influencing citizen attitude toward e-government adoption and use”, *Computers in Human Behavior*, Vol. 53 No. C, pp. 189-203.
- Alshibly, H. and Chiong, R. (2015), “Customer empowerment: does it influence electronic government success? A citizen-centric perspective”, *Electronic Commerce Research and Applications*, Vol. 14 No. 6, pp. 393-404.
- Arnstein, S.R. (1969), “A ladder of citizen participation”, *Journal of the American Institute of Planners*, Vol. 35 No. 4, pp. 216-224.
- Bélanger, F. and Carter, L. (2008), “Trust and risk in e-government adoption”, *Journal of Strategic Information Systems*, Vol. 17 No. 2, pp. 165-176.
- Bertot, J.C., Gorham, U., Jaeger, P., Sarin, L. and Choi, H. (2014), “Big Data, open government and e-government: issues, policies and recommendations”, *Information Polity*, Vol. 19 No. 1, pp. 5-16.
- CGI.br (2017), *Survey on the Use of Information and Communication Technologies in Brazilian Households: ICT Households 2016*, Brazilian Internet Steering Committee, CGI.br, São Paulo.

- Chen, J.V., Jubilado, R.J.M., Capistrano, E.P.S. and Yen, D.C. (2015), "Factors affecting on-line tax filing—an application of the IS success model and trust theory", *Computers in Human Behavior*, Vol. 43, pp. 251-262, available at: www.sciencedirect.com/journal/computers-in-human-behavior/vol/43/suppl/C
- Cordella, A. and Bonina, C.M. (2012), "A public value perspective for ICT enabled public sector reforms: a theoretical reflection", *Government Information Quarterly*, Vol. 29 No. 4, pp. 512-520.
- Cordella, A. and Paletti, A. (2018), "ICTs and value creation in public sector: manufacturing logic vs service logic", *Information Polity*, Vol. 23 No. 2, pp. 125-141.
- Criado, J.I. and Gil-García, J.R. (2013), "Electronic government and public policy: current status and future trends in Latin America", *Gestión y Política Pública*, Vol. 22 No. 2, pp. 3-48.
- Gil-García, J.R. and Luna-Reyes, L.F. (2006), "Integrating conceptual approaches to e-government", in Mehdi Khosrow-Pour, D.B.A. (Ed.), *Encyclopedia of E-Commerce, E-Government and Mobile Commerce*, Idea Group Reference, Hershey, PA, pp. 636-643.
- Gil-García, J.R., Helbig, N. and Ojo, A. (2014), "Being smart: emerging technologies and innovation in the public sector", *Government Information Quarterly*, Vol. 31 No. S1, pp. I1-I8.
- Gil-García, J.R., Zhang, J. and Puron-Cid, G. (2016), "Conceptualizing smartness in government: an integrative and multi-dimensional view", *Government Information Quarterly*, Vol. 33 No. 3, pp. 524-534.
- Gjermundrød, H. and Dionysiou, I. (2015), "A conceptual framework for configurable privacy-awareness in a citizen-centric e-government", *Electronic Government, an International Journal*, Vol. 11 No. 4, pp. 258-282.
- Gupta, J.P. and Suri, P. (2017), "Measuring public value of e-governance projects in India: citizens' perspective", *Transforming Government: People, Process and Policy*, Vol. 11 No. 2, pp. 236-261.
- Hilgers, D. and Ihl, C. (2010), "Citizensourcing: applying the concept of open innovation to the public sector", *International Journal of Public Participation*, Vol. 4 No. 1, pp. 67-88.
- Hoe, S.L. (2016), "Defining a smart nation: the case of Singapore", *Journal of Information, Communication and Ethics in Society*, Vol. 14 No. 4, pp. 323-333.
- Hui, G. and Hayllar, M.R. (2010), "Creating public value in e-government: a public-private-citizen collaboration framework in Web 2.0", *Australian Journal of Public Administration*, Vol. 69 No. 1, pp. 120-131.
- Hung, M.J. (2012), "Building citizen-centred e-government in Taiwan: problems and prospects", *Australian Journal of Public Administration*, Vol. 71 No. 2, pp. 246-255.
- Karkin, N. and Janssen, M. (2014), "Evaluating websites from a public value perspective: a review of Turkish local government websites", *International Journal of Information Management*, Vol. 34 No. 3, pp. 351-368.
- Karunasena, K. and Deng, H. (2012), "Critical factors for evaluating the public value of e-government in Sri Lanka", *Government Information Quarterly*, Vol. 29 No. 1, pp. 76-84.
- Kearns, I. (2004), *Public Value and E-Government*, Institute for Public Policy Research, London.
- Kelly, G., Mulgan, G. and Muers, S. (2002), *Creating Public Value*, Cabinet Office, London.
- Lee, S.M., Hwang, T. and Choi, D. (2012), "Open innovation in the public sector of leading countries", *Management Decision*, Vol. 50 No. 1, pp. 147-162.
- Lindgren, I. and Jansson, G. (2013), "Electronic services in the public sector: a conceptual framework", *Government Information Quarterly*, Vol. 30 No. 2, pp. 163-172.
- Lopes, K.M.G. (2016), "Fatores direcionadores para a criação de valor público na adoção de serviços eletrônicos pelo cidadão", master's thesis, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre.
- Luna-Reyes, L.F., Gil-García, J.R. and Romero, G. (2012), "Towards a multidimensional model for evaluating electronic government: proposing a more comprehensive and integrative perspective", *Government Information Quarterly*, Vol. 29 No. 3, pp. 324-334.

-
- Meijer, A. (2015), "E-governance innovation: barriers and strategies", *Government Information Quarterly*, Vol. 32 No. 2, pp. 198-206.
- Olnes, S., Ubacht, J. and Janssen, M. (2017), "Blockchain in government: benefits and implications of distributed ledger technology for information sharing", *Government Information Quarterly*, Vol. 34 No. 3, pp. 355-364.
- Osborne, S.P., Radnor, Z. and Strokosch, K. (2016), "Co-production and the co-creation of value in public services: a suitable case for treatment?", *Public Management Review*, Vol. 18 No. 5, pp. 639-653.
- Rhodes, R.A.W. and Wanna, J. (2009), "Bringing the politics back in: public value in Westminster parliamentary government", *Public Administration*, Vol. 87 No. 2, pp. 161-183.
- Rose, J., Persson, J.S. and Heeager, L.T. (2015), "How e-government managers prioritise rival value positions: the efficiency imperative", *Information Polity*, Vol. 20 No. 1, pp. 35-59.
- Savoldelli, A., Codagnone, C. and Misuraca, G. (2014), "Understanding the e-government paradox: learning from literature and practice on barriers to adoption", *Government Information Quarterly*, Vol. 31 No. S1, pp. S63-S71.
- Stoker, G. (2006), "Public value management: a new narrative for networked governance?", *The American Review of Public Administration*, Vol. 36 No. 1, pp. 41-57.
- Sun, T.Q. and Medaglia, R. (2018), "Mapping the challenges of artificial intelligence in the public sector: evidence from public healthcare", *Government Information Quarterly*, available at: <https://doi.org/10.1016/j.giq.2018.09.008>
- Tang, H.L., Chung, S.H. and Se, C.W. (2009), "Examining the impact of possible antecedents on service usage: an empirical study on Macao e-government", *Electronic Government, an International Journal*, Vol. 6 No. 1, pp. 97-109.
- UNPAN (2016), "United Nations e-government survey", United Nations Public Administration Network, available at: <http://workspace.unpan.org/sites/Internet/Documents/UNPAN96407.pdf> (accessed February 4, 2018).
- Wang, C. (2014), "Antecedents and consequences of perceived value in mobile government continuance use: an empirical research in China", *Computers in Human Behavior*, Vol. 34, pp. 140-147, available at: www.sciencedirect.com/journal/computers-in-human-behavior/vol/34/suppl/C
- Wirtz, B.W., Weyerer, J.C. and Schichtel, F.T. (2018), "An integrative public IoT framework for smart government", *Government Information Quarterly*, available at: <https://doi.org/10.1016/j.giq.2018.07.001>
- Zhang, J., Puron-Cid, G. and Gil-Garcia, J.R. (2015), "Creating public value through open government: perspectives, experiences and applications", *Information Polity*, Vol. 20 Nos 2/3, pp. 97-101.

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