

Cibercidadão: Evolution of Citizen Participation in Public Administration



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Abstract The Cibercidadão initiative began with the advent of digital transformation and the digital government law, which identified the need for efforts to improve digital public services. However, it was also observed that the improvement of digital public services would not be achieved individually with a view only from the public service, but together with the view of the citizen who uses this service. Thus, we identified that the citizen himself would be the most interesting part of this transformation process, as digital public services must be developed to meet the needs and expectations of citizens. In this scenario, we identified the existence of the Cibercidadão in society, that active and participative citizen of the public administration, which contributes to the improvement of public services. Thus, the Cibercidadão methodology places the citizen at the center of the digital transformation, sending ideas about technology and government, developing software solutions, testing and evaluating the solutions made available to society. Finally, the Cibercidadão is applied in a Government Program aimed at the development of innovative and citizen-centered software solutions, whose results are already promising.

Keywords Digital government · Public administration · Shared administration · Cybercitizen

1 Introduction

Digital transformation has been a key theme for the future of digital services provided by the government. Brazilian law 14.129/2021 establishes the “principles, norms and instruments to increase the efficiency of public administration, especially through

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reducing bureaucracy, innovation, digital transformation, and citizen participation” [1]. However, providing services to improve the lives of citizens is one of its main challenges and requires a better understanding of needs, capacities, limitations, and expectations of citizens. This law is an important milestone to follow in the footsteps of Estonia, which is a world reference in digital government and makes almost all public services available digitally to citizens, who do not need to go to government agencies, face queues, and bureaucracy [2].

In this scenario, *Cibercidadão* aims to bring government and citizens closer together based on the principles of shared management, inviting all citizens to be part of public administration with the application of information and communication technology (ICT). Given that digital transformation is an arduous and time-consuming process that does not always meet the expectations of the citizen, *Cibercidadão* supports in the development of innovative and citizen-centric software solutions to provide qualified and inclusive digital public services. For this, citizens are invited to submit ideas related to ICT and government, which will be analyzed and implemented as technological solutions with citizen participation. Then, the citizen takes part in the test of the solution in order to verify that the expectations were met in terms of need, usability and accessibility. Finally, with the use of the service made available to the citizen, it is expected the citizen’s participation in evaluations and feedbacks for the continuous improvement of the services.

This article presents the fundamentals of the *Cibercidadão* methodology, as well as its application in a government program aimed at the development of innovative and citizen-centered software solutions. Since the program is aimed at all citizens, including those with disabilities, it considers the participation of different citizen profiles (students, elderly, disabled, and others) and implements technological accessibility resources (screen reader, signal assistant, audio assistant, and assistant virtual). The rest of this article is organized as follows. Section 2 presents the citizen participation. Section 3 discusses the related work. Section 4 presents the methodology to be used in designing new citizen-centric products. Section 5 presents the results case study of the application of the *Cibercidadão*. Section 6 presents the results and discussions about the *Cibercidadão* Program. Finally, Sect. 7 presents conclusions and future work.

2 Citizen Participation

Citizen participation in public administration originated in the late 1980s by the Organization for Economic or Economic Cooperation and Development (OECD) and was called customer-focused administration. In the early 1990s, Brazil began to use this concept comprehensively in public administration, being called citizen-focused administration. The objective is to offer efficient and quality public services that meet the needs of citizens. With this new administration, the services provided try to be clear and precise, including resources from the public sector to the demands of the citizen [3].

The relationship between communication and politics presents concepts related to public communication [4]. On the one hand, the Habermasian concept of public communication takes place in the public sphere, based on the idea of social mobilization [5]. On the other hand, public communication is defined in five dimensions [4, 5]: **Politics**: is related to the “government” legislative and the construction of public goods; **Media**: takes place in the panoramas of the media, oriented toward information management and public agenda, as well as cultural processes; **State**: is related to communicative interactions between government and society; **Organizational**: organizations being public or private, the interests of these groups seek to predominate and impose their meanings. It has a corporate character, instances, and benefits of collective interest; **Social life**: are the spontaneous or non-spontaneous correlations of associations and social movements, which have collective or group mutuality, launching proposals of collective and public interest.

3 Related Work

Study Alves’ verified the process of creating government portals in governmental IT companies in the 25 states of Brazil and found that the managers’ concern is in relation to the qualification of the developers, in relation to the designs there was no such concern, one of the questions to managers was the following: “*Is there a professional who takes care of the design of the screens and who does some research with the users?*” there were no positive responses. The products are developed without using the user-centered design methodology, all the portals presented accessibility and usability issues [6].

What corroborates Harrison et al. [7] user-centric designs include rapid ethnography, focus group, interview, drawing technique, paper prototyping, and high-fidelity prototyping. This type of analysis complements formal user ratings. This approach enriches user-centric design, which typically focuses on understanding in context and producing sketch designs.

For Cunha [8], information and communication technology (ICT) in the public sector in the area of digital, must be accompanied by technological innovation to propose improvements in public service (e-services). All citizens must not be assisted in the same way, with no privilege or compensation for social status, promoting citizenship.

For Cristóvam [9], ICTs have the potential to assist innovation and encourage the provision of consistent and update public services that society is about to use. Digital government must comply with the principles of (i) efficiency, aiming for maximum satisfaction of the citizen user; (ii) universality, maximizing the scope of availability of such services; and (iii) timeliness, ensuring that technological advances. ICTs should bring about the digital inclusion of socially vulnerable, handicapped, and low-income classes.

4 Methodology

The Cibercidadão places the citizen at the center of the digital transformation and, therefore, define the methodology comprising the following phases in Fig. 1: collection, development, testing, and evaluation, which, based on their integrations, are capable of generating new services and improvements in services and processes.

In the first phase, the **Collection Phase**, the citizen witnesses the public service and sends ideas involving technology and government. Ideas are analyzed by experts and stored in the ideas base, categorizing them according to the subject and their feasibility.

In the second phase, the **Development Phase**, viable ideas are deepened and directed toward development, which can take place through hackathons, research, or institutional partnerships. For the hackathon, citizen ICT students from different know-how participate in a programming marathon to develop technological solutions from ideas submitted by citizens in a short period of time. From the winning solutions, a final product is designed to serve the entire society, materializing the idea sent by the citizen. In this case, students participate in the construction of the technological solution so that academia gets closer to real problems. For the research, citizen researchers work in the study and discovery of technological solutions based on ideas submitted by citizens. In this case, the government has the opportunity to apply science to the solution of ideas sent by the citizen, as well as the academy has the opportunity to leave the theoretical level and apply its findings in practice. For the partnerships, academic, public, and private institutions join efforts to develop solutions in order to meet the citizens' ideas.

In the third phase, **Testing Phase**, citizens are invited to be beta testers of the solutions developed, acting as end-users of the service offered before it is launched. The tests are carried out with citizens of different profiles, including those with disabilities, prioritizing usability and accessibility. The results of the evaluations are stored in the test base and used for adjustments and improvements to the solution under development.

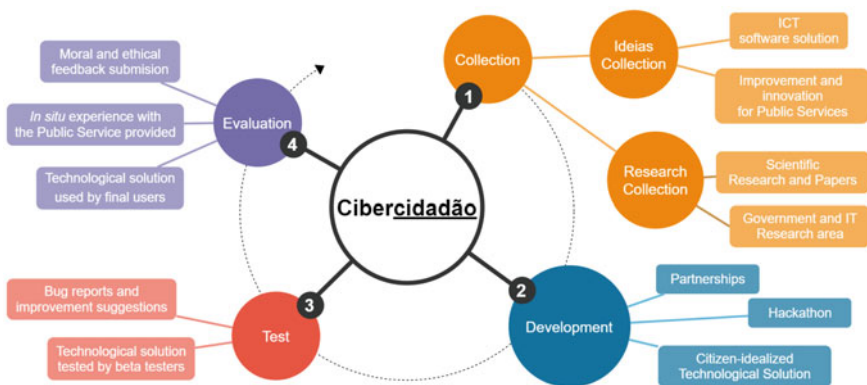


Fig. 1 Cibercidadão methodology

In the fourth phase, the **Evaluation Phase**, the solution developed and tested in the previous phases is made available to society. As citizens use the solution and take advantage of the public service offered, they send feedback and evaluation about the solution and contribute to the continuous improvement of the solution and the delivery of public services.

5 Case Study of the Application of the Cibercidadão

Cibercidadão was applied as a government program in the state of Espírito Santo, in Brazil, which has about 4 million people and approximately 1 million people with disabilities. In honor of the methodology, the program was called Cibercidadao Espírito Santo and has a Web portal to communicate with citizens and monitor the phases.

5.1 Web Portal Cibercidadão

Since Web portal intends to involve all citizens, including those with disabilities, they has technological resources for accessibility and usability (Fig. 2). Accessibility features were implemented following the national e-MAG (Brazilian Government Accessibility Model) [10] and international Web Content Accessibility Guidelines (WCAG) [11] guidelines, which allow keyboard navigation and navigation using screen readers, enabling user interactions.

One such feature is the **Pounds Assistant** which translates text into sign language. To use it, just click on the blue icon in the right corner of the page. Then, select the text and wait for the content to translate into Libras signs. Another feature is the **Audio Assistant**, responsible for converting text to sound as well as sound to text. To use it, you must first select the content, click on “Listen to Selection” and wait for the assistant to read it. An **Virtual Assistant** is also part of the resources available on the portal to serve the citizen, clarifying doubts and directing to the program phases. In addition to these features, the portal is also configured for the use of **Assistive Software** that identifies website elements and reads the content for people with disabilities, who have difficulty consuming written information.

To ensure that the resources made available on the portal serve the citizen, the resources were evaluated in an automated way through tools and manual through experts, including with the participation of the citizen (people members of the project).

The technological architecture used to implement the Web portal is a client-server, with C# programming language. Natural language processing heuristics are applied from a definition of writing in a domain-specific language. Furthermore, features are implemented and integrated with libraries related to the translation of texts, pounds, and audio.



Fig. 2 Technological resources of the Cibercidadão portal

5.2 Application

The Web portal was launched to receive the ideas submitted by the citizen, that is, collection phase. This phase lasted three months and adopted the following strategy: filter, classification, and analysis of ideas. All ideas received are initially filtered by a support technician according to the content, namely random content, incomplete content, or content involves technology.

After filtering, in the classification, IT analysts check whether the idea that involves content technology corresponds to an existing solution improvement, process improvement, or innovative idea. After classification, the idea is analyzed according to the criteria of creativity, technical analysis, ease of implementation, potential for implantation, and impact on the citizen, being developed through hackathons, educational institutions, public bodies, and by the institution itself. Each idea is scored from 0 (weak) to 5 (strong) for each criterion.

In the development phase, the program executed hackathons with graduate students, who produced a software solution for one of the ideas submitted by the citizen. For the testing phase, citizens sign up to test the software, and the evaluation phase takes place through citizen feedback sent by the solutions made available to society.

6 Results and Discussions

The Cibercidadão program presented in Sect. 5, which applies the Cibercidadão methodology and offers a Web portal for communication, is online for just four months and is already showing promising results.

In the collection phase, the program received around 147 ideas submitted by the citizen, [Table 1, Quantity (Qt)], of which 33% have random content and 67% are related to the Program's objective. Of these related ideas, 40 with existing solutions, 10 with solution improvement, and 18 with innovation ideas. The Innovation Ideas related to new services presents ideas for usability problems and lack of functionality in the websites of the State of Espírito Santo, such as health, education, traffic, and

Table 1 Category of ideas received by the program

Category	Description	Qt
Random content	No information—text without information, repeated letters	4
	Random subject—subject out of context	20
	Inappropriate—spam and insults	25
Incomplete content	Has no description needed to deduce a solution	3
Technology content	Creation of new services	18
	Ideas about process optimizations	40
	Availability of Wi-Fi in schools and neighborhoods	27
	Solution improvement	10

controllership. For example, one of the ideas is the creation of an application that informs the amount of blood in the banks and invites the donor to carry out the donation procedure whenever the gap time is over.

In the development Phase, the program carried out a hackathon with computer students who produced a software solution for one of the ideas submitted by the citizen, namely *Integrated FAQ that allows you to search and access information related to government services*. The solution produced by the students at the hackathon is being transformed into a software product to be offered to society, being tested and subsequently evaluated.

7 Conclusion and Future Work

The Cibercidadão methodology made it possible for the Cibercidadão program to be a pioneer in Brazil in adopting a methodology for capturing ideas perceived by citizens and applying them to society, promoting shared management, research conducted in other 25 States did not find a program similar to this one. In addition, an analysis carried out on all institutional websites in the state found that there are no accessibility and usability features implemented on the websites (report available on the project website¹). The program is a pioneer in the State of Espírito Santo in providing a fully accessible Web portal for people with disabilities, including providing a virtual assistant, audio, and pounds. These resources are capable of providing citizen engagement to the program. Citizen engagement is the crucial point for the success of initiatives promoted by the government [12].

¹ <https://lino.prodest.es.gov.br/esgovaccessivel>.

The ideas submitted by citizens are simple, but they can bring added value and satisfaction to society [13]. The program, despite still being in the initial stage, is promoting the opportunity for society to express the problems day to day in the use of digital public services by taking positive feedback from a range of citizens, even though some citizens feel excluded due to a lack of access to computers, smartphones, and others.

The next phases of the program that are being implemented are the test phases, which will be responsible for testing the developed solution, and the evaluation phase, which will be responsible for citizen feedback on the digital public service offered. As future work, the solutions developed will be analyzed quantitatively and qualitatively based on feedback from citizens.

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