

Benchmark for Public Ombudsman Portals of the State Courts of Accounts in Brazil

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In Brazil, public ombudsman offices, established to handle citizen complaints about public services, face challenges amidst the ongoing digital transformation of governmental institutions. While government strategies aim at modernization, practical implementation falls short, evident in issues such as infrastructure problems and service disconnection. This extends to public ombudsman offices, as it is part of the public bodies, being difficult even to measure and compare their portals to each other. This study, conducted in partnership with the State Court of Accounts of Pernambuco, seeks to address these challenges by creating a benchmark for evaluating Brazilian State Courts of Accounts' ombudsman portals. Drawing on relevant legislation, the Brazilian Public Ombudsman Maturity Model, and public service literature, the benchmark establishes requirements and acceptance criteria, validated by public service specialists, aiming to evaluate the portals and through this evaluation, assist the ombudsman's offices in understanding what needs to be improved or implemented on their portals to achieve their objectives. This benchmark also enables ombudsman's offices to learn from each other. The main conclusions highlights the need for public ombudsman portals to improve the way they implement their core services, such as registering and tracking of citizen's manifestations. Additionally, there's an emphasis on the necessity for portals to reach a broader audience by implementing more accessibility features and modernizing their communication and navigation through virtual assistants and chat bots. The application of the benchmark also clarifies that there are better-developed portals that can serve as inspiration for less-developed ones, both in general and in terms of specific requirements.

Additional Keywords and Phrases: Ombudsman, Public Service, E-Government, Benchmark

1 INTRODUCTION

Public ombudsman offices, in Brazil, were conceived as an instance or department responsible for receiving, analyzing and forwarding complaints made by citizens in relation to public services and institutions, enabling the exercise of social control over them. In Brazil, the first public ombudsman's office was created in 1986, in the city of Curitiba, and a few years later they gained more strength, being widely implemented throughout the country [1].

Over time, the need to modernize the services offered by the government became more evident given the digital transformation process that institutions were undergoing, seeking to offer higher quality and more optimized services for

citizens [2]. However, the digital transformation process is not simple when it comes to government and public bodies. Many laws needed to be adapted or constructed in the midst of this process, such as the Brazilian Access to Information Law enacted in 2011, which provides for the procedures that public bodies must observe in order to guarantee access to information [3]. As a result, several strategies have been proposed, such as digital government strategies, seeking to organize the principles, objectives and initiatives in an attempt to guide the government's digital transformation, following several initiatives from civil society, such as [4] and [5].

Although the government presents strategies for applying digital transformation, the results are not very satisfactory. According to indices in a report from the Organization for Economic Co-operation and Development (OECD), infrastructure problems and disconnection of services provided were identified, which represents just some of the problems faced in the attempt to implement the government's modernization process [6]. It is no different with public ombudsman offices. For example, the General Ombudsman's Office of the Federal District, in the period from May 2022 to May 2023, achieved resolution of only 40% of the cases received via the internet, which may indicate problems in the way in which citizen's manifestations are being handled and forwarded for the ombudsman and/or problems in the institution's internal processes in dealing with these demands [7].

It is important that public ombudsman portals are developed in accordance with the service provided by the institution to which they are linked, for better targeting of information and better handling of demands, but it is essential that these portals are in accordance with the laws that establish them, such as the Brazilian Access to Information Law (Law no. 12,527) and the Public Services User Participation, Protection and Defense Law (Law no. 13,460). Furthermore, several studies on public service and ombudsman portals raise quality indicators for them, which can thus lead to the state of the art on public portals, assisting in their development, as detailed in Section 2. The Public Ombudsman Maturity Model (MMOuP), developed by the Brazilian Office of the Comptroller General, establishes a theoretical basis so that ombudsman offices can understand the current state of their internal processes [8], which can help the ombudsman office define its next steps to the development process and translate some of these points into their portal. However, the non-specificity of the legislation on how an ombudsman portal should be developed reveals the need to create a set of requirements, which may serve as an evaluation metric for the restructuring of portals as a whole, aiming for their improvement, standardization, modernization and adequacy the laws.

This study originated from a partnership with the State Court of Accounts of Pernambuco. In this context, this study aims to create a benchmark with well-founded requirements and acceptance criteria to evaluate the ombudsman portals of the Brazilian State Court of Accounts through it. To create the requirements for this benchmark, we relied on laws 12,527 and 13,460, the Brazilian Public Ombudsman Maturity Model, and also the state of the art in public service and ombudsman offices. The acceptance criteria were also developed based on these principles, but to align them with the reality of the ombudsman offices of the State Court of Accounts, they were validated by public service specialists. With the benchmark and evaluation, we aim to help the public ombudsman offices in improving their portals, making them more accessible, easy to use and transparent, so that they can also achieve their objectives.

The remainder of this paper is organized as follow: Section 2 presents the related legislation and literature review that supported the creation of the benchmark requirements and acceptance criteria; Section 3 presents the methodology with the steps and sub steps to the development of this study; Section 4 presents the results of the study, with the creation, validation and application of the benchmark to the evaluation of the public ombudsman portals; Section 5 presents a discussion about the results obtained from the evaluation and highlights common points observed in the portals; and Section 6 presents concluding remarks.

2. RELATED WORKS

2.1 Related legislation

Law No. 12,527/2011, known as the Access to Information Law, enacted on November 18, 2011, ensures the right of access to information produced and held by public entities, except for information under legal secrecy. This law brought several improvements to the democratization of information in Brazil, as it promotes a culture of transparency, helping participatory democracy and, consequently, preventing corruption and improving public management, such as presented in [9], [10] and [11]. One of the means proposed by the law for making this information available is public portals, therefore, public ombudsman portals are directly influenced by this law, since one of the ombudsman's roles is to provide information to citizens within the provisions of this law.

Law No. 13,460, known as the Public Service User Protection and Defense Law, enacted on June 26, 2017, regulates the participation, protection and defense of public service users in Brazil [12]. This law's main objective is to improve the relationship between citizens and public authorities, encouraging the provision of quality services and improving communication between the parties through ombudsman offices. With this, it establishes the role of the ombudsman and its functions in receiving complaints from citizens, processing them, forwarding them to the responsible agency and communicating back the appropriate responses, in addition to all other procedures related to its functioning as a whole, thus the most important law for creating a normative framework for ombudsman offices.

These two main laws guide the process of formulating a public ombudsman, both in terms of information treatment and how it is made available, as well as the functional level of an ombudsman. The Public Ombudsman Maturity Model also uses these laws as a basis in its foundation, emphasizing their importance in dealing with public ombudsmen. Even though it's not a law, the Public Ombudsman Maturity Model establishes maturity level criteria for some internal processes of a public ombudsman, which can be adapted for their web portals. Although this maturity model establishes points that may be important for understanding the current state of internal processes of an ombudsman, these points are not specific to evaluate its portal, making it ineffective for external improvement of the ombudsman.

2.2 Literature review

When comparing the functioning of public ombudsman offices in Brazil with other countries, even those that are founding members of the Open Government Partnership (OGP) - the initiative that gave rise to the Brazilian Access to Information Law - their issues can vary significantly, as each country has its own legislation and way of executing it. In Indonesia [13], one of the 8 founding OGP countries, as well as Brazil, there are issues in how the ombudsman's recommendations are followed by the responsible bodies, a problem that is also common in some ombudsman offices in Brazil. In Wales [14], a legislative reform was established to broaden the scope of the ombudsman, intending to improve public service standards, a proposal made in Brazil in 2017 with the Law on Participation and Defense of Public Service User. Early, in 2000, in countries like England [15], there were proposals aimed at improving ombudsman offices and raising public awareness about the ombudsman and its role, recognizing that the ombudsman would become an extremely important channel for citizen communication with the government. Shortly after, Brewer [16] emphasized the importance of having effective systems to deal with public expressions, also highlighting the risks and problems faced by the public sector in dealing with these systems at that time. While it is possible to learn from the issues faced by ombudsman offices in other countries, the solutions to each problem are individual. However, assess the ombudsman to obtain a diagnosis of its strengths and weaknesses become extremely necessary for planning solutions.

To understand the Brazilian scenario it is important to know how the ombudsman works internally and externally to actually define what is needed to be evaluate. Neves [17], details the role of the ombudsman and its importance in digital government, seeking to show that the social control exercised by citizens is fundamental to the preservation of a democratic political system. Silva [18] is based on the principles that underlie a public ombudsman's office to carry out an analysis of the ombudsman's office at the Federal University of Campina Grande in order to evaluate its efficiency and resolution, thus identifying points for improvement in its processes. Junior [19], on the other hand, carried out a more comprehensive analysis of citizen participation channels, including the ombudsman's office, evaluating whether this participation was actually being considered in the definition of laws and projects of the Legislative Assembly of Minas Gerais, that is, evaluating the effectiveness and resolution of the channels to also highlight points where the ombudsman could be more active or points in which the ombudsman could improve its processes. These studies managed to carry out a good documentary analysis of the ombudsman's processes, revealing the need to improve the implementation of their services not only externally, with regard to the citizen, but also internally, involving the ombudsman and public authorities, highlighting the e-participation portals as they contain most of the processes.

Corrêa [20] assessed the level of transparency of open data in 20 municipalities in Brazil to identify the compliance of these portals with the Access to Information Law of 2011. This law aligns with the principles of the Open Government Partnership (OGP), establishing parameters that government open data should follow, which also includes the portals of public ombudsmen, as this is one of the main laws that establishes their regulations. The author developed criteria and applied them in a survey format on these websites, concluding that municipal governments at the time exhibited a certain level of immaturity regarding the requirements of the Access to Information Law. In a follow-up work [21], Corrêa applied the same parameters previously developed to more municipalities, 561 in total, selected through criteria based on the percentage of population representation. Despite being a more in-depth study, the author reached a similar conclusion to the previous one. However, he also concluded that the Access to Information Law itself was not being sufficiently direct with the principles of the OGP, which could impact the efficiency of implementing open data portals. Both of Corrêa's works are important for defining evaluative criteria for public websites as they are based on the laws that govern this domain. They also highlight the lack of compliance that these webpages have with the legislation.

Zahn [22] conducted a documentary analysis of 20 municipal ombudsman offices in the state of Mato Grosso, in order to evaluate the availability and access of these communication channels. The author developed evaluation criteria based on the role of the ombudsman and ombudsman office, as established by law, concerning participatory democracy - where citizens are expected to exercise social control towards the government. These criteria were applied to the selected municipalities, consisting of 10 of the most populous and 10 of the least populous. The study concluded that, despite some progress, the digital implementation of ombudsman offices still requires improvement, as only 15% of the evaluated channels meet all the criteria for availability and access. The criteria used by the author, while grounded in the functioning of public ombudsman offices, did not regard parameters of the Access to Information Law, which applies to municipalities with more than 10,000 inhabitants. The 10 least populous municipalities, with a maximum of 2,794 inhabitants, did not meet any of these criteria. Nevertheless, the criteria developed by Zahn are important for enhancing the efficiency of an ombudsman office portal in terms of its range, which is one of the principles of participatory democracy.

In Summary, the public ombudsman's office is an extremely important instrument for the process of participatory democracy, as through it citizens can exercise their role in monitoring public power. For this, the ombudsman's office needs to be active, efficient and resolute, and these characteristics must be evaluated to identify in which areas the ombudsman's office is falling short or whether it is being limited by other legislative and bureaucratic obstacles. With

this, it is necessary to have a well-founded set of requirements and evaluation metrics, such as a benchmark, so that public ombudsmen can identify potential issues, plan improvements, and even extract knowledge from the evaluation of other portals, thus fostering mutual enhancement.

3. METHODOLOGY

This study originated from a partnership with the State Court of Accounts of Pernambuco, driven by the need to establish a set of requirements and acceptance criteria for the development and improvement of its ombudsman portal. To achieve this, we formulated the following research questions:

RQ01 – What are the main requirements for an ombudsman office of a State Court of Accounts in Brazil?

RQ02 – How do the ombudsman office of the State Courts of Accounts meet these requirements?

To address these research questions, we structured our methodology into three complementary steps, aiming to create a benchmark that describes the requirements, details their acceptance criteria, and ultimately being used to evaluate and generates a final score for the State Courts of Accounts to self-assess and plan improvements accordingly. Figure 1 illustrates the methodology steps and their sub steps.

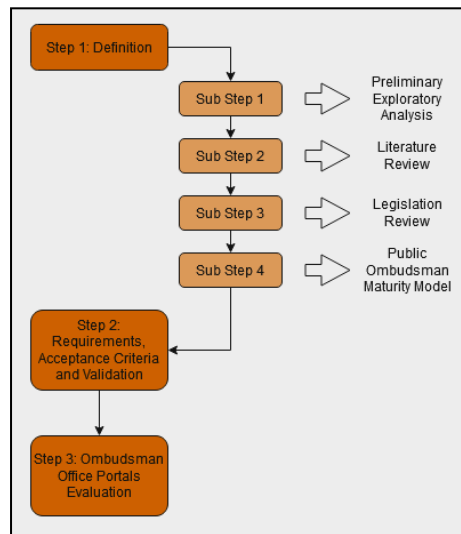


Figure 1: Methodology illustration with steps and sub steps.

3.1 Step 1 – Definition

The first step involved defining the problem. To achieve this, we subdivided it into four sub steps: preliminary exploratory analysis, literature review, legislation review, and a review of the Brazilian Public Ombudsman Maturity Model, which will be detailed in the subsections below.

3.1.1 Preliminary exploratory analysis

This step involved analyzing, as a citizen, some public ombudsman portals in the country to generate an initial understanding of their current state. In this preliminary analysis, the evaluator should identify points that would influence citizen action through the portal and how the portal facilitates this interaction, as some of these points could become

requirements. The portals evaluated in this step were selected as follows: portals recommended by experts from the State Court of Accounts of Pernambuco; and portals selected from each Brazilian region, to ensure representativeness in the sample. Thus, each portal was assessed by the author of this study, who considered the following points:

- 1 – Using a search engine, how difficult is it to find the ombudsman's page?
- 2 – Are the information on the ombudsman's page organized, i.e., user-friendly?
- 3 – Some pages provide a virtual assistant to facilitate navigation. Is there a virtual assistant? Is it useful?
- 4 – Pages must provide a manifestation registration form. What is the difficulty level in using this form?
- 5 – Pages must offer ways to track registered manifestations. What is the difficulty level for this?
- 6 – Does this page have accessibility for people with disabilities?

The evaluation of these portals was conducted using different classifications for each requirement, following a logical hierarchy among them. The intention of this evaluation was not to classify but to understand the state of ombudsman portals. The table below (Table 1) illustrates the preliminary analysis conducted in July 2023.

Table 1: Preliminary exploratory analysis.

Ombudsman's office	Ease of Access	Information Organization	Virtual Assistant Utility	Ease of Usage	Tracking of process	Accessibility
General Ombudsman of Ceará	Easy	Organized	Medium	Easy	Easy	Partial
General Ombudsman of Federal District	Easy	Very Organized	Medium	Medium	Hard	Partial
State Court of Accounts of Ceará	Easy	Organized	Nonexistent	Hard	Medium	Nonexistent
State Court of Accounts of Minas Gerais	Easy	Very Organized	Nonexistent	Easy	Easy	Partial
State Court of Accounts of Mato Grosso	Easy	Organized	Nonexistent	Easy	Hard	Nonexistent
State Court of Accounts of Pernambuco	Medium	Organized	Low	Easy	Easy	Nonexistent
State Court of Accounts of Paraná	Easy	Very Organized	Nonexistent	Medium	Easy	Partial
State Court of Accounts of Rio Grande do Norte	Easy	Very Organized	Nonexistent	Hard	Easy	Partial
State Court of Accounts of São Paulo	Easy	Organized	Nonexistent	Easy	Medium	Partial
State Court of Accounts of Rio de Janeiro	Easy	Very Organized	Nonexistent	Medium	Medium	Partial
State Court of Accounts of Amazonas	Easy	Very Organized	Nonexistent	Easy	Hard	Nonexistent
State Court of Accounts of Pará	Medium	Organized	Nonexistent	Hard	Medium	Nonexistent
State Court of Accounts of Bahia	Easy	Organized	Nonexistent	Easy	Easy	Nonexistent

This preliminary analysis led to the understanding that there is a deficiency in ombudsman portals, and some of these deficiencies may be common among them. However, it also highlighted the need for a more in-depth exploration of ombudsman offices (functions, duties, and objectives) so that the requirements could be sufficiently grounded for the creation of a benchmark. In addition to this, other evaluative works on ombudsman offices and/or public services should also be analyzed to learn from their methodologies in identifying requirements and evaluative criteria for such types of (governmental) pages.

3.1.2 Literature review

After the preliminary exploratory analysis of some public ombudsman portals, it was essential to understand the worldwide role of the ombudsman, its attributions, and functions so that we could define appropriate requirements. Additionally, investigating the state of the art regarding evaluative methods for ombudsman offices and/or public services was necessary to create precise criteria and requirements for the issue at hand. Therefore, as the second step in our definition step, we conducted a literature review to extract knowledge and define some requirements. This literature review was already detailed in subsection 2.2 of Section 2 of this paper.

Through this step, we understood the functions and objectives of the ombudsman, highlighting the importance of social control exercised by citizens through it to strengthen transparency and participative democracy. Consequently, we found that some requirements identified in the preliminary analysis were consistent with these characteristics of the ombudsman and also with some requirements present in other scientific works, such as ease of access through search algorithms and the organization of information on the page. Another identified point was legislation. Since the ombudsman is a public entity, it must comply with the laws that govern it, including its online portals. Therefore, to define truly grounded requirements, we needed to understand the legislation related to ombudsman offices.

3.1.3 Legislation review

As a public entity, the public ombudsman falls within the scope of Brazilian legislation. An ombudsman portal must also follow the laws governing its entity. Therefore, to gather requirements and acceptance criteria aligned with the reality of a public ombudsman, it was crucial to understand these laws. The legislation review was detailed in subsection 2.1 of Section 2 of this document.

Combined with the literature review, this legislation review served as the necessary foundation for constructing the requirements and acceptance criteria for the benchmark, which will be described in the second step.

3.1.4 Public Ombudsman Maturity Model (MMOuP)

The Brazilian Public Ombudsman Maturity Model (MMOuP) was developed by the Office of the Comptroller General as a tool that establishes a set of criteria and indicators measuring different levels of development within an ombudsman office, aiming to serve as a reference for optimizing objectives, structure, and internal processes. However, this model does not assess the quality of ombudsman portals or how they should operate, which distinguishes it from this study. Nevertheless, the MMOuP also relies on the laws governing ombudsman offices, serving as a reference for the development of some requirements and criteria for this benchmark.

3.2 Step 2 – Requirements, acceptance criteria and validation

For the second step of this study, after establishing a foundation of knowledge about public ombudsman offices, we created the requirements and acceptance criteria to evaluate a public ombudsman portal. As described in the previous step, we used the concepts of public ombudsman, as well as the legislation that governs them, to support some points raised in the preliminary analysis and to actually create new requirements and criteria. The aim was to define the benchmark, which is the evaluative metric for public ombudsman portals.

Since this study was conducted in partnership with the State Court of Accounts of Pernambuco, we had access to public service specialists and the ombudsman's own management, being the director of the governance committee, 3 members of his board, the main director of the ombudsman committee and her assistant. We had two meetings with the members of the governance committee and one with the board of the ombudsman committee to ensure that the requirements and acceptance criteria for the benchmark were truly consistent with the reality and objectives of the

ombudsman. Finally, a workshop was held to present the requirements and criteria identified during this stage of the study. During the workshop, the specialists validated and prioritized the requirements, ranking them to determine its weights for the benchmark.

3.3 Step 3 – Ombudsman offices portals evaluation

Once the requirements and criteria for the benchmark were defined and validated, the next step was to evaluate the ombudsman offices. As this is a study in partnership with the State Court of Accounts of Pernambuco, we decided to assess the ombudsmen of all State Courts of Accounts in Brazil and the Federal District. This decision was made to avoid bias in the validation of our requirements and criteria if generalized to all Courts of Accounts across the country.

This evaluation was conducted according to the criteria previously established, checking whether each ombudsman portal complied, partially complied, or did not comply with the identified and validated requirements.

This step was crucial for creating the benchmark, assigning scores, calculating the weight of each requirement based on the prioritization by specialists and, ultimately, generating a final ranking of the scores for each State Court of Accounts' ombudsman. This ranking can be utilized as a metric for planning and improving the ombudsman portal of each court.

The results of the application of our methodology will be detailed in the following Section 4, describing the requirements, acceptance criteria, the prioritization made by the specialists, and the results of our benchmarking, including the ranking and the classifications of public ombudsman portals, in which the focus was on all State Courts of Accounts in Brazil, including the Federal District.

4. RESULTS

The requirements and acceptance criteria were created according to the steps of our methodology, with each requirement deriving from one or more of the following sources: Legislation; Literature review; Preliminary analysis; and Public Ombudsman Maturity Model. Also, each requirement has three acceptance criteria: Complies; Partially complies; and Not complies. Table 2 below shows the requirements, the sources from which each was derived, and its description. Following that, Table 3 illustrates the acceptance criteria for each requirement, describing when the ombudsman portal complies, partially complies, or not comply with that requirement.

Table 2: Requirements, sources and description.

Requirement	Source	Description
Ease of access through search algorithms	Literature Review; Preliminary Analysis.	To reach a larger number of citizens, the ombudsman should be easily found through common search engines such as Google, Yahoo!, and Bing. For this requirement, a specific search string is used in portuguese: "ouvidoria tce xx," where "xx" is the abbreviation of a Brazilian state.
Organization of information on the page	Legislation; Literature Review; Preliminary Analysis.	The ombudsman's portal needs to provide citizens with necessary information about its objectives and services, such as the service charter, to guide them on its page. Moreover, according to Law 13,460, government service technological solutions must be simple, facilitate information sharing with users, use understandable language, avoid acronyms, jargon, and foreign words.
Ease of access to ombudsman services	Preliminary Analysis.	Both the Brazilian Access to Information Law and the Law on Participation, Protection, and Defense of the User of Public Services provide that citizens' access to public services must be facilitated in any medium. Therefore, the ombudsman's portal cannot be an exception, all its services must be easily accessible so that a greater number of citizens can use it, allowing the ombudsman to achieve its goals of participatory democracy.
Organization and structuring of the manifestation registration form	Legislation; Literature Review; Preliminary Analysis.	The manifestation registration form is where the ombudsman's service actually takes place. This form needs to include both user information and respect their rights as provided in Laws 12,527 and 13,460. Additionally, the form is material that will be used by the ombudsman to be taken to the public institution. Therefore, the more sections of information it contains, the easier it will be for the ombudsman to filter and address the high demand received.
Ease in the manifestation tracking process	Legislation; Preliminary Analysis; MMOuP.	The manifestation tracking process is provided by Law 13,460, where the ombudsman must inform the citizen about any updates or responses to their manifestation. Furthermore, Law 12,527 foresees the treatment of citizen information to protect their data and also foresees the facilitation of citizen access to the service. Therefore, this process must be simple and integral in handling citizen information, providing secure and varied means for tracking the process.
Usefulness level of virtual assistant and/or chatbot	Preliminary Analysis.	The use of virtual assistants and/or chatbots by government pages is not mandatory. However, aiming to reach a larger number of citizens, the ombudsman must rely on people with low technological knowledge, where technology would help them navigate the page, register manifestations, track processes, etc. Technologies like these are already used by some ombudsmen, such as the General Ombudsman of Ceará and the General Ombudsman Federal District.
Usefulness level of satisfaction evaluation tool for page components	MMOuP.	According to the Public Ombudsman Maturity Model of the Office of The Comptroller General, having tools that assess user satisfaction with the service is a maturity criterion for ombudsman. Therefore, in the context of ombudsman portals, it is desirable to have such tools so that the ombudsman can receive feedback on how its portal is performing to plan and implement improvements.
Accessibility of the page for people with disabilities	Legislation; Preliminary Analysis; MMOuP.	According to Law 12,527, it is the duty of public body pages to provide tools for the accessibility of people with disabilities. Ombudsman portals cannot be an exception, and it is desirable for ombudsmen to cover as many citizens as possible, making these tools even more valuable.
Portability for mobile devices	Literature Review.	According to DATAREPORTAL, in February 2023, Brazil has more smartphones than people, representing 112% of the population. Additionally, 97.1% of internet access in the country is via mobile devices compared to 67.7% on computers [23]. Therefore, aiming to reach a larger number of citizens, the ombudsman's portal must have portability to be accessed on mobile devices without difficulty or information limitation. This requirement should evaluate whether the ombudsman's page can be accessed through the default browser of a mobile device, comparing its operation with the same portal being accessed through a computer, verifying if the information on the page is similar, and if registration and tracking services can be accessed equally.

Table 3: Acceptance criteria.

Requirement	Complies	Partially Complies	Not Complies
Ease of access through search algorithms	The ombudsman's portal is found on the first page of the three main search engines (Google, Yahoo!, and Bing).	The ombudsman's portal is not found on the first page of at least 1 of the three main search engines (Google, Yahoo!, and Bing).	The ombudsman's portal is not found on 2 or more of the three main search engines (Google, Yahoo!, and Bing).
Organization of information on the page	The ombudsman's page contains information about the ombudsman, manifestation registration, process tracking, and other ways to contact the ombudsman, described in a comprehensible and informative manner for citizens.	The ombudsman's page has limited information about the ombudsman, manifestation registration, process tracking, or other ways to contact the ombudsman. This also applies to pages that have information but are not comprehensible, containing acronyms, jargon, or foreign terms.	The ombudsman's page does not contain information about the ombudsman, manifestation registration, process tracking, or other ways to contact the ombudsman.
Ease of access to ombudsman services	The ombudsman's services, such as manifestation registration and process tracking, can be easily and intuitively accessed through the ombudsman's homepage.	The ombudsman's homepage leads to other page(s) where the ombudsman's services are available, but not in an organized manner. This also applies to cases where the ombudsman's services are displayed on the first page in a disorganized manner.	The homepage of the ombudsman does not intuitively and/or easily lead users to its services or requires challenging redirects.
Organization and structuring of the manifestation registration form	The manifestation registration form is organized, providing all necessary information described and segmented to facilitate the process for citizens and for the ombudsman to filter them.	The manifestation registration form is intuitive but has little description of the necessary information and/or is not sufficiently segmented for the ombudsman to filter the manifestation more easily.	The form is not intuitive, has little or no information to assist the user, and/or there is no form, only a text box, making the filtration process difficult for the ombudsman.
Ease in the manifestation tracking process	The process of tracking a manifestation can be done through a protocol number and another means such as email, SMS, notification by portal registration, and/or phone. In addition, the status of the manifestation tracking must be visible to the complainant.	The process of tracking manifestations can only be done through one means: protocol number, email, SMS, notification by portal registration, and/or phone. This also applies to cases where the page only allows tracking of processes for users who have registered (logged in) and cases where the status of manifestation tracking cannot be found.	The process of tracking manifestations is not available for anonymously submitted manifestations. This also applies to cases where sensitive information about the complainant is provided in the tracking by protocol number.
Usefulness level of virtual assistant and/or chatbot	The ombudsman's page has a virtual assistant capable of helping the user find information about the ombudsman, assist in making a manifestation, assist in tracking the process, and also assist in contacting the ombudsman. This also applies to cases where the ombudsman's page has some technology that helps the user register a manifestation.	The ombudsman's page has a virtual assistant, but it cannot help the user find information about the ombudsman, assist in making a manifestation, assist in tracking the process, or offer other ways to contact the ombudsman.	The ombudsman's page does not have a virtual assistant/chatbot or similar technology.
Usefulness level of satisfaction evaluation tool for page components	The services offered by the ombudsman's portal can be evaluated individually.	Only the ombudsman as a whole can be evaluated at some point on the page, either on the homepage or at the end of the manifestation/ tracking process.	There is no tool for evaluating the portal.
Accessibility of the page for people with disabilities	The ombudsman's page provides accessibility for people with hearing and visual impairments through tools such as VLibras, text descriptors, etc.	The ombudsman's page offers accessibility for only one type of impairment, hearing or visual, through tools such as VLibras, text descriptors, or others.	The page does not offer any type of accessibility for people with disabilities.
Portability for mobile devices	The page can be fully accessed through mobile devices without loss or confusion of information compared to the desktop version.	The page can be accessed by mobile devices, but there is confusion or loss of information compared to the desktop version.	The page cannot be accessed by mobile devices. This also applies to cases where the page can only be accessed through applications.

Before the creation of the benchmark, and as the next step after definition and validation of the requirements and acceptance criteria, we evaluated the public ombudsman portals of all the State Court of Accounts of Brazil. This evaluation took place between November 29, 2023, and December 05, 2023. Table 4 below shows the evaluation of the ombudsman portals. Each line of the first column corresponds to the abbreviation of a Brazilian state and the other columns corresponds to the order of requirements in Table 2.

Table 4: Ombudsman offices evaluation.

Court of Accounts State	Ease of access through search	Organization of information on	Ease of access to ombudsman	Organization and structuring	Ease in the manifestation	Usefulness level of virtual	Usefulness level of satisfaction	Accessibility of the page for	Portability for mobile devices
AC	Complies	Complies	Complies	Partially	Partially	Not Complies	Not Complies	Not Complies	Complies
AL	Complies	Complies	Partially	Complies	Complies	Not Complies	Not Complies	Not Complies	Complies
AP	Complies	Complies	Complies	Complies	Partially	Not Complies	Not Complies	Partially	Complies
AM	Complies	Complies	Complies	Complies	Not Complies	Not Complies	Not Complies	Not Complies	Complies
BA	Complies	Complies	Partially	Partially	Partially	Not Complies	Not Complies	Not Complies	Complies
CE	Complies	Complies	Complies	Partially	Partially	Not Complies	Not Complies	Not Complies	Complies
DF*	Complies	Partially	Not Complies	Not Complies	Not Complies	Not Complies	Not Complies	Not Complies	Not Complies
ES	Complies	Complies	Partially	Partially	Complies	Not Complies	Not Complies	Partially	Complies
GO	Complies	Complies	Complies	Not Complies	Not Complies	Not Complies	Not Complies	Complies	Complies
MA	Complies	Complies	Complies	Partially	Partially	Not Complies	Not Complies	Not Complies	Complies
MT	Complies	Complies	Partially	Partially	Not Complies	Not Complies	Complies	Not Complies	Complies
MS	Complies	Complies	Complies	Complies	Complies	Not Complies	Partially	Partially	Complies
MG	Complies	Partially	Complies	Partially	Not Complies	Not Complies	Not Complies	Partially	Complies
PA	Complies	Complies	Not Complies	Complies	Complies	Not Complies	Not Complies	Not Complies	Complies
PB	Complies	Complies	Not Complies	Not Complies	Not Complies	Not Complies	Not Complies	Not Complies	Complies
PR	Complies	Complies	Complies	Partially	Not Complies	Not Complies	Not Complies	Not Complies	Complies
PE	Complies	Complies	Complies	Partially	Partially	Not Complies	Not Complies	Not Complies	Partially
PI	Complies	Not Complies	Complies	Partially	Not Complies	Not Complies	Not Complies	Not Complies	Complies
RJ	Complies	Complies	Complies	Partially	Complies	Not Complies	Not Complies	Partially	Complies
RN	Complies	Complies	Not Complies	Not Complies	Not Complies	Not Complies	Not Complies	Partially	Partially
RS	Complies	Partially	Complies	Partially	Not Complies	Not Complies	Not Complies	Not Complies	Complies
RO	Complies	Partially	Not Complies	Not Complies	Partially	Not Complies	Not Complies	Not Complies	Complies
RR	Complies	Complies	Complies	Partially	Partially	Not Complies	Not Complies	Not Complies	Complies
SC	Complies	Complies	Complies	Partially	Complies	Not Complies	Not Complies	Complies	Complies
SP	Complies	Complies	Complies	Complies	Partially	Not Complies	Not Complies	Partially	Complies
SE	Complies	Partially	Complies	Partially	Not Complies	Not Complies	Not Complies	Partially	Complies
TO	Complies	Complies	Complies	Complies	Partially	Not Complies	Not Complies	Not Complies	Not Complies

With the evaluation of the portals completed, along with the prioritization of requirements by experts, the benchmark could be created.

The prioritization by specialists was divided into parts. The specialists were divided into two groups: public service and ombudsman management. To ensure that each group had an equivalent weight, we summed the ranking given by each individual within each group and divided it by the number of members in that group (Table 5), thus creating a weighted average of the prioritization given by each group for the ranking of requirements. In the Aggregated Priorities: the column Sp. Public Services represents the sum of the Spec. 1, 2, 3 and 4 for the respective requirement; the column Ombudsman Management represents the sum of Omb. Man. 1 and 2 for the respective requirement; and the column Requirements represents the sum of Sp. Public Services divided by its number of members and Ombudsman Management divided by its number of members. Note: As the scores deal with ranking, the following grades represent the ranking of that requirement for the specialist, meaning that the lower the value, the more important it is.

Table 5: Requirements prioritization by the specialists and ombudsman management.

Requirement prioritization									
Requirement	Specialists						Aggregated priorities		
	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Omb. Man. 1	Omb. Man. 2	Sp. Public Services	Ombudsman Management	Requirements
Ease to search	7	1	2	1	2	2	11	4	4,75
Page informations	9	4	5	2	5	5	20	10	10
Access to services	8	2	1	5	1	1	16	2	5
Manifestation registration form	1	3	3	3	3	3	10	6	5,5
Manifestation tracking	5	5	4	6	6	6	20	12	11
Virtual assistant/chatbot	3	7	8	4	8	8	22	16	13,5
Satisfaction tool	4	8	7	8	7	7	27	14	13,75
Accessibility	6	9	9	7	9	9	31	18	16,75
Portability	2	6	6	9	4	4	23	8	9,75

After determining the ranking provided by the specialists and the ombudsman management, we defined the values 1, 0.5, and 0 for the corresponding ratings of complies, partially complies, and not comply, respectively. We also assigned weights to the requirements, ranging from 1.9 to 1.1, as all requirements are crucial for a public ombudsman, and we did not want the difference in score between the most important and least important requirements to be more than 2 times their value. These weights would multiply the ratings obtained for each requirement through the acceptance criteria (complies, partially complies, and not comply), thus generating the score for each requirement. Table 6 shows the final ordering of the requirements and the weight assigned to each one, based on the aggregated priority of the requirements (Table 5).

Table 6: Reordering of requirements and weights.

Reordering of Requirements		
Requirement	Importance	Weight
I - Ease to search	4,75	1,9
II - Access to services	5	1,8
III - Manifestation registration form	5,5	1,7
IV - Portability	9,75	1,6
V - Page informations	10	1,5
VI - Manifestation tracking	11	1,4
VII - Virtual assistant/chatbot	13,5	1,3
VIII - Satisfaction tools	13,75	1,2
IX - Accessibility	16,75	1,1

Just like the Office of the Comptroller General in Brazil assesses the transparency of some public portals generating a ranking of portals with higher indices [24], we applied our benchmark to the ombudsman portals of the State Courts of Accounts and generate a ranking, as mentioned earlier. The final benchmark score is calculated by summing the score for each requirement (already multiplied by the weight) divided by 13.5, which is the sum of the weights (1.1 + 1.2 + ... + 1.9), to keep it within a range of 0 to 1. Table 7 shows the result of our benchmarking. Note: despite the Federal District (DF) is not a state, its functioning is similar, thus we added its Court of Accounts in our research.

Table 7: Benchmarking of ombudsman portals of the State Courts of Accounts.

State	I - Ease to search	II - Access to services	III - Manifestation	IV - Portability	V - Page information	VI - Manifestation	VII - Virtual assistance	VIII - Satisfaction	IX - Accessibility	Score	Ranking
MS	1,9	1,8	1,7	1,6	1,5	1,4	0	0,6	0,55	0,8185	1st
SC	1,9	1,8	0,85	1,6	1,5	1,4	0	0	1,1	0,7519	2nd
AP	1,9	1,8	1,7	1,6	1,5	0,7	0	0	0,55	0,7222	3rd
SP	1,9	1,8	1,7	1,6	1,5	0,7	0	0	0,55	0,7222	4th
RJ	1,9	1,8	0,85	1,6	1,5	1,4	0	0	0,55	0,7111	5th
AL	1,9	0,9	1,7	1,6	1,5	1,4	0	0	0	0,6667	6th
ES	1,9	0,9	0,85	1,6	1,5	1,4	0	0	0,55	0,6444	7th
AM	1,9	1,8	1,7	1,6	1,5	0	0	0	0	0,6296	8th
AC	1,9	1,8	0,85	1,6	1,5	0,7	0	0	0	0,6185	9th
CE	1,9	1,8	0,85	1,6	1,5	0,7	0	0	0	0,6185	10th
MA	1,9	1,8	0,85	1,6	1,5	0,7	0	0	0	0,6185	11th
RR	1,9	1,8	0,85	1,6	1,5	0,7	0	0	0	0,6185	12th
PA	1,9	0	1,7	1,6	1,5	1,4	0	0	0	0,6000	13th
MT	1,9	0,9	0,85	1,6	1,5	0	0	1,2	0	0,5889	14th
GO	1,9	1,8	0	1,6	1,5	0	0	0	1,1	0,5852	15th
PR	1,9	1,8	0,85	1,6	1,5	0	0	0	0	0,5667	16th
TO	1,9	1,8	1,7	0	1,5	0,7	0	0	0	0,5630	17th
PE	1,9	1,8	0,85	0,8	1,5	0,7	0	0	0	0,5593	18th
BA	1,9	0,9	0,85	1,6	1,5	0,7	0	0	0	0,5519	19th
MG	1,9	1,8	0,85	1,6	0,75	0	0	0	0,55	0,5519	20th
SE	1,9	1,8	0,85	1,6	0,75	0	0	0	0,55	0,5519	21st
RS	1,9	1,8	0,85	1,6	0,75	0	0	0	0	0,5111	22nd
PI	1,9	1,8	0,85	1,6	0	0	0	0	0	0,4556	23rd
PB	1,9	0	0	1,6	1,5	0	0	0	0,55	0,4111	24th
RO	1,9	0	0	1,6	0,75	0,7	0	0	0	0,3667	25th
RN	1,9	0	0	0,8	1,5	0	0	0	0,55	0,3519	26th
DF*	1,9	0	0	0	0,75	0	0	0	0	0,1963	27th

The benchmark scores serve more than one purpose. Apart from serving as a parameter for ranking ombudsman portals, they also help the Court of Accounts understand the level of its ombudsman portal. This understanding can be further extended to the criteria of each requirement, aiming to meet their specifications. Therefore, to establish levels that can serve as indicators of quality or alerts, we created four classifications: high, when the score is greater than 0.75; medium when the score is greater than 0.5 and less than 0.75; low when the score is greater than 0.25 and less than 0.5; and very low when it is less than 0.25. These levels are shown in Table 8, and the results for the ombudsman portals in Table 9 below.

Table 8: Classification of ombudsman portal quality level.

Classification
$x < 0,25 = \text{Very low}$
$0,25 < x < 0,5 = \text{Low}$
$0,5 < x < 0,75 = \text{Medium}$
$x > 0,75 = \text{High}$

Table 9: Quality levels of ombudsman portals of State Courts of Accounts.

State	Score	Classification
MS	0,8185	High
SC	0,7519	High
AP	0,7222	Medium
SP	0,7222	Medium
RJ	0,7111	Medium
AL	0,6667	Medium
ES	0,6444	Medium
AM	0,6296	Medium
AC	0,6185	Medium
CE	0,6185	Medium
MA	0,6185	Medium
RR	0,6185	Medium
PA	0,6000	Medium
MT	0,5889	Medium
GO	0,5852	Medium
PR	0,5667	Medium
TO	0,5630	Medium
PE	0,5593	Medium
BA	0,5519	Medium
MG	0,5519	Medium
SE	0,5519	Medium
RS	0,5111	Medium
PI	0,4556	Low
PB	0,4111	Low
RO	0,3667	Low
RN	0,3519	Low
DF*	0,1963	Very Low

5. DISCUSSION

Analyzing the scores obtained by the evaluated portals for each requirement, we can observe that requirements I, II, IV, and V are met by the majority of the portals, with requirement I being met by all of them. These requirements are linked to the functions of the portal as a web page, meaning whether this page is easily found by search engines (Google, Bing, Yahoo!), if the expected service is easily accessible, if the information on the page is organized and if it offers the same functions for mobile devices. On the other hand, requirements III and VI are related to the functions of an ombudsman in receiving citizen manifestations and providing information about the processing of these manifestations, allowing citizens to track them. In these two requirements, there is already a decrease in the level of compliance with the criteria by some portals, indicating potential issues in the formulation of the manifestation form and/or the tracking process, making it difficult or non-existent. This could highlight points of concern for these ombudsmen.

Although most portals either comply or partially comply with the most important requirements, the less critical requirements are overlooked by almost all, being 84% Not Complies, 13% Partially Complies and only 3% Complies. In public service, one of the primary objectives is to reach as many citizens as possible, enabling participatory democracy and, in the case of ombudsman portals, ensuring that the social control exerted by their users is indeed effective.

With the recent growth of artificial intelligence, the use of these technologies to bring solutions closer to the target audience has become increasingly necessary. The adoption of chatbot and virtual assistants is one of the most neglected requirements by the ombudsman portals of the State Courts of Accounts, even though these technologies are already being employed by portals of other public ombudsmen, such as the General Ombudsman of Ceará and the General Ombudsman of the Federal District. Furthermore, artificial intelligence can also be utilized for text simplification, natural language processing (such as GPT), and assistance in website navigation, potentially reaching a larger number of citizens.

Another noteworthy point is the lack of satisfaction assessment tools. Despite the evident effort by public ombudsmen to improve their portals, knowing the user satisfaction level with each part of the website is crucial for defining and planning improvements.

Digital accessibility for people with disabilities is another aspect that is neglected by most ombudsman portals evaluated in the benchmark. Although mandated by law, accessibility is not well-specified for State Courts of Accounts to have clarity on how to implement it. However, there is the Digital Accessibility Best Practices Guide [25], developed in collaboration between the British and Brazilian governments, which outlines key aspects of digital accessibility and how to achieve it. Therefore, public services, including ombudsman offices and their portals, should rely on this guide to enhance their levels of accessibility and, consequently, reach a larger number of citizens.

6. CONCLUSION

Public ombudsman portals are indeed crucial tools for citizens to interact with ombudsman and, consequently, with the government. In the modern society, the online environment is the most widely used for communication, services, and various other purposes. Therefore, developing high-quality public services for the internet is not just a necessity but an obligation for responsible public bodies. This holds true for public ombudsman portals as well.

Although the laws regulating ombudsman offices, along with the Ombudsman Public Maturity Model, are not highly specific regarding their online portals, understanding these laws and the state of the art in public service and e-government can indicate necessary requirements for the development of an ombudsman portal that can achieve its objectives.

This study has created and validated a set of metrics, requirements, and acceptance criteria, validated by public service specialists and the ombudsman's management of the State Court of Accounts of Pernambuco. This set can serve as a basis to classify the level of compliance of a public ombudsman portal with this benchmark through an evaluation. It helps to identify areas for improvement and future implementations. Additionally, this benchmark can be used to compare compliance levels among ombudsman portals, as indicated in its results, so that institutions can learn from each other, guiding improvement planning. With the creation of this benchmark, we were also able to answer our research question 01 (RQ01 - What are the main requirements for an ombudsman office of a State Court of Accounts in Brazil?) through the 9 requirements identified in this study which were validated by the specialists.

Through the application of our benchmark, we obtained the following results for the requirements: I - Ease of access - 100% of the portals complied; II - Access to ombudsman services - 66.6% of the portals complied and 14.8% partially complied; III - Manifestation form - 25% of the portals complied and 55.5% partially complied; IV - Portability for

mobile devices - 85% of the portals complied and 7% partially complied; V - Organization of information on the page - 77.7% of the portals complied and 18.5% partially complied; VI - Manifestation tracking - 22.2% of the portals complied and 33.3% partially complied; VII - Virtual assistant - 0% of the portals complied; VIII - Satisfaction tool - 3% of the portals complied and 3% partially complied; and IX - Accessibility for people with disabilities - 7% of the portals complied and 33.3% partially complied. This benchmarking addressed our research question 02 (RQ02 – How do the ombudsman office of the State Courts of Accounts meet these requirements?) by evaluating these portals with the requirements and its acceptance criteria.

The State Court of Accounts of Pernambuco is incorporating the results of this benchmark to enhance their ombudsman portal, and although this benchmark was developed within the context of state courts of accounts, its foundation in understanding, creation, validation, and evaluation can be generalized to other ombudsman scenarios. As future works, the natural next step is to apply this benchmark in more public spheres, making it even more robust and aiding their ombudsmen offices to improve continuously. Furthermore, the ranking generated by the benchmarking can help ombudsmen offices within that sphere to assist each other, with lower-ranked offices drawing inspiration or reaching out directly to the higher-ranked ones.

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