LUMEN ET VIRTUS

The impact of the Implementation of Information and Communication Technologies – ICT – for the transparency of government acts in the Brazilian Public Administration

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ABSTRACT

The implementation of information and communication technologies (ICT) in the Brazilian public administration has been the subject of study and reflection due to the impacts they can bring to the transparency of government acts. This qualitative-explanatory study aimed to investigate the impact of ICT on transparency in the Brazilian public administration, identifying barriers and benefits regarding its implementation. This research was carried out with reference to the keywords: transparency, electronic governance, public administration, information and communication technology; and as a database for the search of articles Google Scholar, Scielo, Capes and Anpad Steel, in addition to government websites and transparency portals; During the research, current legislation, government policies and publications in the period from 2010 to 2024 were considered. In this vein, preliminary results indicate significant advances in the use of ICT in the Brazilian public administration, demonstrating improvements in the efficiency of operations, transparency and quality of the services provided through the automation of processes, improvement in decision-making and greater integration with regard to the coordination of activities. However, despite the advances observed, challenges to be overcome were identified, such as issues involving cybersecurity, inequality between levels of access to information, and resistance to change on the part of some actors involved. In addition, the study, in addition to dealing with a current and relevant topic, also observes gaps and provides data that may be important for other research that is being carried out.

Keywords: Public Administration, Electronic Government, Information and Communication Technology, Transparency.

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INTRODUCTION

This research used articles published from 2010 to 2024, with the objective of studying the impact of the implementation of information and communication technologies for transparency in the Brazilian public administration, identifying barriers and benefits about the implementation of these technologies, as well as discussing how ICTs have contributed to the improvement of public services provided and to the level of transparency of government acts before society. In this sense, according to Procópio et al., (2020, p. 10) "the results also show that it is not only enough to have information technology resources and infrastructure to increase e.Gov actions, it is also necessary to include information technology actions aimed at citizens, especially service provision and digital inclusion".

Furthermore, in recent years, the implementation of information and communication technologies in public administration has become a global trend in response to the growing demands for efficiency and transparency; notably, here in Brazil, more strongly, since 2011, with the advent of new technologies and the birth of new legislation, especially Law 12.527/2011, which deals with access to information (LAI) (Brasil, 2011).

In this wake, the public administration in many parts of the world, and here in Brazil, has adopted information and communication technologies as a fundamental part of its operations, therefore, the implementation of information and communication technologies (ICT) has been an extremely relevant and current topic in the Brazilian public administration and has brought with it significant impacts on transparency, efficiency and governance. In this vein, Di Marco and Terci (2022, p.314) understand that the "main innovation in the disclosure of the acts and results of the public administration was made possible mainly through the use of digital platforms – transparency portals – which publicize information and data to those who are interested, contributing to accountability in management".

Thus, with the use of ICT, public entities can have higher levels of efficiency, greater transparency and a more capillary citizen participation, thus promoting improvements in decision-making and services. In this way, the relationship between government and society is reshaped by ICTs, as highlighted by Transparency International (2016b), since there is the promotion of more democratic governance and the strengthening of citizen participation in policy choices.

From another perspective, in addition to the benefits, we have the barriers regarding the implementation of these ICT technologies, in this line, Melitski et al. (2011, p. 463) warn of some of these obstacles that we still face regarding the adoption of these technological tools, which, according to him, are the individual, organizational and strategic barriers. From another perspective; Luciano, Wiedenhöft, and dos Santos (2018, p. 288) understand that the resistance of agencies to actively provide information was the barrier most related to transparency, followed by the lack of

adequate management and political support. Thus, we have that there are many barriers yet to be overcome.

Furthermore, in view of these challenging and transformative scenarios, this study sought to analyze the impact of ICT on the transparency of acts perpetrated by the Brazilian public administration. In this context, within the context of the research, Giareta and Di Giulio (2018) understand that the implementation of information and communication technologies (ICT) has changed the way of life and the relationships between individuals and between citizens and the State in urban spaces. Thus, as societies mature politically, there is a growing clamor for popular participation and transparency of government acts. In this sense, Digital Governance is the way governments use ICTs to provide people with convenient information, government services and also provide greater possibilities for citizen participation (Luciano, Wiedenhöft and dos Santos, 2018).

THEORETICAL FRAMEWORK

For the research, 23 articles were selected that make up the analysis portfolio, and a narrative synthesis was carried out, when the study was grouped into three themes. These themes were addressed based on the studies of authors who investigate these themes.

BRAZILIAN SCENARIO REGARDING THE IMPLEMENTATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES – ICT

The Brazilian public administration has been undergoing an important digital transformation, since it has used ICT for the provision of various public services, interaction with citizens and dissemination of information to society aiming at the efficiency and especially the transparency of government acts, proof of this is the adoption, by several government agencies, of these technologies as a solution for the optimization of processes; in this sense, Maciel (2020, p.14) understands that "the digitalization of public management will impact and transform the way government acts, the way services are formulated and provided, and the relations between the State and civil society".

In this wake, the Federal Government has taken the lead through some actions/services, such as the government services portal "gov.br", which seeks to bring together a range of public services in a single online place; also the government procurement system, another important example, which aims at modernization, efficiency and especially transparency of federal government purchases. Thus, from the point of view of Giaretta and Di Giulio (2018), ICTs reconfigure the process of production of public space and expand the processes of negotiation and decision-making, especially in situations where there are risks and conflicts of power and interests.

Furthermore, in this context, the Brazilian scenario is dynamic, thus reflecting the breadth of technological and regulatory evolution. In this line, the use of Information and Communication Technology (ICT) in the Brazilian public administration, as long as it is well regulated, has the potential to improve the efficiency, transparency and quality of public services, in this regard, as Angélico and Teixeira (2012) explain, the Access to Information Law describes how government agencies should provide information to the public, establishes how the State should deal with requests for information and describes the structure necessary for the reception of these requests, also observing a system of recourse and punitive measures for those who do not comply with them.

In addition, with regard to ICT technologies, with regard to the Brazilian scenario, we can still mention (Law 14.533/2023). This legislation deals with the national policy for digital education, which seeks to boost innovation, digital inclusion and digital transformation in the public sector, thus aiming at the promotion and technological development, which brings breadth to the principle of transparency, and economic development of the country through strategies ranging from the promotion of ICT education to the stimulation of research and innovation. Which, according to Maciel, (2020, p.14) "will promote, therefore, a true revolution and reconstruction of Brazilian governance, under new bases that are more transparent, participatory and innovative".

In addition, these innovations privilege access to information and consequently the transparency of public acts, so necessary, in the current context, to the administration and citizens. In this line, Law 12.527/2011 – Access to Information Law (LAI) – which was enacted with the purpose of guaranteeing access to information, based on the provisions of item XXXIII of Article 5, item II of paragraph 3 of Article 37 and paragraph 2 of Article 216, all of the Federal Constitution, is an extremely important milestone with regard to the transparency of acts and access to government data in Brazil.

In this dance, she made it mandatory to provide public information, encouraging the opening of government data to society; in this sense, there is also Law 13.709/2018, which deals with the general data protection policy and established a new legal framework for the protection of personal data, this law significantly affects the treatment of government information and the privacy of citizens.

In this way, Information and Communication Technology is playing an increasingly relevant role in various aspects of Brazilian society, bringing more "connectivity" between the public administration and the citizen and more connectivity in the sense of access to the internet by those who live in the corners of the country. Thus, Guerra and Carvalho (2019, p. 2) understand that "access to information, in addition to being a citizen's right, has a decisive role in the exercise of citizenship through the social control of the Public Administration, thus imposing limits on public managers."

However, it could be found that, in fact, in addition to the advances, mainly regulatory, there are still many barriers to the implementation of ICT, in this sense, we can mention, as an example, digital inclusion, since there is no equal access to technology, whether for territorial reasons, or for social and economic reasons, being a very dense challenge to be overcome. Within this context, the studies by Ribeiro (2011, p. 169) point out that "the North region was the one that presented the worst average scores in relation to the development of actions aimed at the use of ICT as a mechanism to facilitate communication between taxpayers and the Public Administration."

In addition, other challenges detected are concerns about cybersecurity and the need for trained civil servants to deal with new technologies. In this vein, Ribeiro et al., (2021, p. 96) understand that "in addition to the lack of internet access by individuals, there are disparities regarding the activities carried out by network users. In addition, socioeconomic and regional characteristics allow us to understand which groups of the population are most affected by the digital divide. In general, populations in conditions of greater social vulnerability, such as individuals from classes D and E and with less education, as well as those who live far from large urban centers."

Finally, in order to bring greater knowledge about the legislation and better organization of the topic pertinent to the theme, a table was organized containing the main federal laws explained in text and other accessory laws covering the period between 2010 and 2024, as shown in table 1.

Table 1: Main federal legislation on ICT

Main federal legislation, decrees and standards on ICT	What it's about
Access to Information Law (Law 12.527/2011)	It regulates access to public information, allowing citizens to request and obtain data from public agencies.
Ordinance 2,319/2011 of the Ministry of Finance	Establishes guidelines for the governance of Information Technology within the bodies and entities of the direct, autarchic and foundational federal public administration.
Portaria Interministerial 1.072/2012	Define standards from safety of Information to federal government agencies.
Normative Instruction 2/2016 of the Ministry of Planning	Establishes guidelines for the preparation of the Information and Communication Technology Master Plan (PDTIC) in federal government agencies and entities.
Decreton 8.789/2016	Establishes the Open Data policy of the Federal Executive Branch, promoting the availability of government data for public access.
General Data Protection Law (Law 13.709/2018 – LGPD)	Regulates the processing of personal data, establishing rules on its collection, storage, use, and sharing, aiming at protecting privacy.
Lei 13.818/2019	Provides for the responsibility of providing information technology services for cybersecurity.
Decree 10,046/2019	Establishes the digital governance policy, guidelines and mechanisms for digital transformation within the federal government.
Decree 9637/2019	Provides for the digital transformation of public services and establishes guidelines for the use of digital platforms in the relationship with citizens.
Decree 9,903/2019	Regulates the National Information Security Policy, establishing guidelines for the protection of confidential information in the government.

Normative Instruction 19/2020 of the Ministry of Economy	Provides for the development and sharing of computerized systems within the scope of the bodies and entities of the federal public administration.
Ordinance 2,226/2020 of the Ministry of Economy	Establishes the Digital Governance program within the scope of the direct, autarchic and foundational federal public administration.
Lei 14.129/2021	It establishes rules for the implementation of government computer programs and digital transformation in the public sector.
Lei 14.181/2021	Establishes rules for the cybersecurity of agencies and entities of the federal public administration.
Decree 9203/2017	Provides for the governance policy of the direct, autarchic and foundational federal public administration.
Lei 13460/2017	Provides for the participation, protection and defense of the rights of the user of public services of the public administration.
Decree 9094/2017	Provides for the simplification of the service provided to users of public services, ratifies the waiver of notarization and authentication in documents produced in the country and institutes the Charter of Services to Users.

Source: Authorship, (2024)

CHALLENGES FOR THE IMPLEMENTATION OF INFORMATION AND COMMUNICATION TECHNOLOGY – ICT

The implementation of ICT in the Brazilian public administration has brought amplitude, in particular, to the transparency of government acts. However, this journey is not without challenges, which can be aimed at adequate investment, for example, since allocating a satisfactory budget for public policy initiatives aimed at the implementation of these technologies can be a significant barrier, since public procurement and contracting policies are often rigid and can make it difficult to purchase technology. In this sense, Correia et al. (2024) bring to light that public administration has to deal with legal and organizational issues, often complex, when promoting the implementation of new technologies, such as the efficient management of resources and the need for collaboration between different social actors to ensure the provision of services.

Still, another point to be mentioned is the cultural and organizational issues, proof of this is the resistance to change within public organizations, there are also, in addition to what has already been explained, very important issues that could not fail to be brought up, which are those related to security and privacy, since the maintenance of cybersecurity is crucial, Especially in sectors that deal with sensitive information, also, just as important, is the concern for citizens' privacy when collecting and storing data. In this context, Tupy (2018) highlights the importance of robust security strategies to protect sensitive data and ensure citizens' privacy. He emphasizes that the public administration must invest in cybersecurity policies and constant training of servers.

In addition, in order to address the open data policy of the Federal Executive Branch, there is (Decree 9.203/2017). This legislation establishes that the bodies and entities of the direct federal

public administration, autarchic and foundational must make available, in an open and structured way, public data and information in their custody or to which they have access.

In this regard, some of the specific requirements of the decree include: establishing mechanisms for monitoring and evaluating the implementation of the open data policy; define technical and methodological standards for the availability of data; create and maintain an open data catalog, available on an official website, which contains information on the available datasets and their description; promote the culture of open data within the public administration, sensitizing civil servants to the importance of open data; ensure information security and personal data privacy.

These requirements seek to promote transparency, participation, and collaboration through the openness of public data. However, even though Decree 9.203/2017 has established important guidelines for the implementation of the open data policy in the Brazilian Federal Public Administration, as revealed above, there are still several challenges, in addition to those already explained in the study, to be faced for the effective application of ICT, the most cited being as (Luciano, Wiedenhöft and dos Santos 2018, p. 288), "institutional barriers, followed by those related to the quality of information."

Moving forward, we can also bring up the issue of organizational culture as an important obstacle, since many public administration bodies still have a closed culture in relation to information sharing. In this context, Viana (2013) understands that resistance to change and the lack of an organizational culture that favors the sharing of information are significant challenges in Brazilian public organizations. Which, through research, could still be observed today.

In turn, seeking to synthesize the barriers brought to light in this study, we brought up the pertinent observations of Melitski et al., (2011) who identified individual barriers, organizational barriers and strategic barriers involving policies and other external constraints that may inhibit the success of initiatives in the area. Thus, dealing with these barriers and effectively overcoming them requires an integrative approach, a vision of the whole. The following table shows the barriers, as shown in table 2.

Table 2: Barriers to ICT implementation

Barriers to ICT implementation	
Individual Barriers	Lack of teinamnete and education; unqualified personnel; lack of personnel.
Organizational Barriers	Lack of management support; lack of planning; high complexity of the projects.
Strategic Barriers	Lack of political support; exaggerated submission to defined objectives; lack of necessary infrastructure.

Fonte: Melitski et al., (2011, p. 463)

Finally, in order to have a guide for overcoming these barriers exposed by Melitski et al., (2011, p. 463), bringing them to the educational technological scope, within the context in question -

through (Law 14.533/2023), which institutes the National Digital Education Policy (PNED), some actions are highlighted for these to be overcome; in this wake, we can mention among the main axes of action of Law (14,533/2023): digital inclusion, which aims to raise awareness about the importance of digital, media, and informational skills; the self-diagnosis of digital skills; training in digital skills, especially for vulnerable groups; access to platforms and repositories of digital resources; certification in digital skills; the connectivity infrastructure in schools and the promotion of digital educational content.

THE IMPACT ON THE IMPLEMENTATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR THE TRANSPARENCY OF GOVERNMENT ACTS IN THE BRAZILIAN PUBLIC ADMINISTRATION

The new ICT technologies employed by government agencies have provided greater transparency with regard to access to diverse data by society, according to Balb (2011), innovations in the implementation of information and communication technologies (ICT) have had a significant impact on the transparency of government actions in the Brazilian public administration, since the adoption of digital tools and online platforms has allowed broader access to information thus expanding the universe of transparency.

In this sense, Angélico and Teixeira (2012, p. 07) point out that communication between subjects emerges as an important tool for Social Management, communication that needs to be mediated by equality of informational resources so that no constraint is capable of threatening the construction of an understanding based on collective interest.

In addition, the implementation of these technologies is changing the patterns of relationship between governments and citizens. Contemporary public administration, voluntarily or reacting to stimuli, has become more sensitive to these changes. Information and Communication Technologies (ICT) are driving a significant transformation in the way public services are delivered and how citizens interact with government. This evolution includes everything from the digitization of services to the creation of citizen participation platforms, which allow for more direct and efficient communication between the government and the population. In this context, Angélico and Teixeira (2012, p.7) highlight that understanding how the process of communicative action contributes to reducing informational asymmetry becomes indispensable.

In addition, the digitalization of public services, for example, has reduced bureaucracy, increased transparency and improved administrative efficiency. This not only facilitates citizens' access to essential services but also strengthens public trust in government institutions. In addition, public administration is increasingly adopting data analysis tools to make evidence-based decisions, which contributes to the development of more effective public policies. Balb (2010, p. 189)

understands that "these new practices are largely associated with the concept of electronic government, which cannot be restricted to the mere automation of offices. The contemporary world demands much more from governments; The demand for greater efficiency of processes, increased transparency and greater effectiveness of public policies has been intense".

In addition, citizen participation platforms, such as transparency portals, online public consultations, and e-governance applications, are empowering citizens by providing them with a more active voice in the formulation and monitoring of public policies. These platforms not only encourage active participation but also promote a culture of accountability, where citizens can demand and monitor the accountability of public managers. In this vein, the TCU (2023) indicates, "public transparency, in addition to playing a fundamental role in the fight against corruption, makes it feasible for society and control bodies to contribute in a timely manner in providing elements for the State to become increasingly efficient, effective, and especially transparent".

Furthermore, in addition, according to the TCU (2023), such portals promote the development of a culture of integrity in the management of public affairs and encourage the effort for better political practices and government programs, this real-time interaction enables governments to provide clarifications, receive feedback from the population and promote civic participation in decision-making processes. In this sense, Figueiredo and Gazoni (2016) have the understanding that a transparent administration allows citizens to participate in the management and control of public administration, but for this to be a reality, citizens must have the ability to know and understand the information that is being disseminated.

In addition, following the logic of Digital Government, the implementation of electronic public management systems has also contributed to the transparency of government acts, since they allow better organization and control of government information. In this vein, we have that digital governance involves the use of technological systems for the management of government information and communication, as well as the participation of citizens with regard to the choices, for example, of state policies to be adopted, thus, these participations of civil society, thanks to the implementation of ICT, take place in real time and online (Mezzomo, Wiedenhoft and Santos, 2018).

However, these innovations brought about by ICT, in addition to significantly impacting the level of transparency of state decisions, require the public administration to continuously invest in the training of its employees, since continuous training in digital skills and data management is crucial to ensure that employees are prepared to use these new technologies effectively and safely. Thus, Viana (2021, p. 132) states that "to deal with all this, governments need more than appointing themselves digital governments. It is necessary to incorporate the rationality of what this means."

METHODOLOGY

The weaving of this study was carried out through a Systematic Literature Review (RSL) on the impact of information and communication technologies - ICT on the transparency of the Brazilian public service, and took into account an expanded approach to the theme presented, being of a qualitative nature, and of a bibliographic nature. The Systematic Review of the Literature proposed in this study comprised the period defined between 2010 and 2024, and was not restricted only to scientific articles. In order to collect articles for the research, the Capes, Scielo and Anpad Steel databases were chosen, as they have significant content in the area of public administration, with priority given to articles published in the last ten years and in Portuguese.

In the first phase of the research, the keywords and Boolean terms for the search were defined. The terms consistent with the study were: transparency, e-government, public administration, public information, information technology. The definitions of the search assembly were defined as follows: AND ("public administration") AND ("e-government") OR ("e-service") AND ("Information technology") AND ("transparency"). This list of words was applied to the Scielo, Capes and Anpad Steel databases.

In all databases, we had articles aligned with this study. Subsequently, based on these criteria, 72 articles were obtained from the aforementioned databases. There was no duplicate content. In addition to the list, the inclusion and exclusion criteria of the articles were also systematized, as shown in chart 3.

Chart 3: Criteria for inclusion and exclusion of articles

Criteria for inclusion (CI)	Exclusion criteria (CE)
CI1 article that has in its title some keyword related to the theme.	CE1 Article that does not mention any of the keywords of the theme in the title.
IC2 abstract of the work is related to the objective of the study	CE2 Abstract does not address anything related to the study
CI3 publication that is available – free download.	CE3 Paid publishing – not available for free download
CI4 Language in Portuguese or English	CE4 Article in other languages
CI5 qualis B3 above	CE5 qualis below B3
IC6 period between 2010 and 2024	CE6 Disregarding articles published before 2010

Source: Authorship, (2024)

Subsequently, a floating reading of all articles was carried out, prioritizing the abstracts and final considerations of each of them, when 56 scientific articles remained. Subsequently, in order to refine the results, a second screening was performed, in addition to those already explained in table 1, with the support of the parsif.al software, given the ease offered by the system in the manipulation and classification of the information. In this regard, during the second selection of articles, the relevance of the article to the context of this research and whether the text presented a contribution within the chosen theme, in addition to the quality of the thematic approach, were considered as criteria.

In addition, after this refinement, it was noticed that there were articles more specifically focused on other areas, such as the technological field (social media and applications); or even that they escaped the proposed context, even if they had keywords associated with the theme in question. In turn, in this second phase of screening, 23 scientific articles that made up the final portfolio remained. Finally, a posteriori, there was a thorough reading of the selected contents.

Furthermore, in the treatment of the collected data, the Iramuteq software, version 0.7 alpha 2, was used, soon after processing in Iramuteq, there was the decoding of the data, through: word cloud, analysis of similarity, the number of occurrences of words in the text and elaboration of word class. Thus, with the use of the information obtained through the use of the software, it became possible to match the articles more appropriately. In addition to the articles selected for the body of the portfolio, other sources were inserted, which were necessary to complement the research. In the end, a content analysis was used with a view to the narrative approach.

RESULTS AND DISCUSSIONS

When proceeding with the studies of the articles selected for the bibliographic portfolio, it was noticed that even with greater difficulties encountered by the municipalities regarding the implementation of ICT, Brazil has made considerable advances in the adoption of these technologies in public administration, in this sense "even though there are limitations, with regard to the municipalities, regarding the use of ICT, there have been advances in relation to the scenario of these technologies" Procópio et al, (2020, p. 06).

In this context, the discussion around the adoption of e-government in Brazil covers different perspectives. The importance of ensuring the quality of the information made available on government portals is highlighted, in order to meet the needs of the population in a clear, accurate, and timely manner. In addition, knowledge management is essential to enhance transparency in public administration, allowing the State to act in a more strategic and collaborative way. Procópio et al., (2020, p. 206) exposes the importance of electronic government, in this line, when they categorically state, after their studies, that "Information technologies keep the public administration connected at all times, evidencing a process of regional restructuring, in which the internet is one of the main factors of change in the various forms of relationships".

In this wake, many Brazilian government agencies have adopted the concept of electronic government, which involves making services and information available online to citizens, making access more convenient. Therefore, the implementation of ICT in public administration is a topic of great relevance that raises several discussions around its benefits, challenges and impacts. Thus, Giaretta and Di Giulio (2018, p. 175) state that "through ICTs, collective movements engage citizens,

drive mobilization, bring to light issues that are apparently silenced, and seek to connect the local with the global.

In turn, notably, the Brazilian scenario - about ICT - has shown that benefits are already being observed as a consequence of this digital and communicational transformation, in this sense, according to Weiss (2019, p. 204), "ICT has become a vital vector for innovations to happen in all areas of human activity, and this includes the creation of possibilities and instruments for companies and individuals to relate to each other". As such, they enable all kinds of information to cross borders, gather information that is geographically distant and available in real time, and support and promote different forms of scientific, technical, commercial, legal, institutional, political, or cultural cooperation.

In this regard, as examples of these benefits, not only for the administration, but also, and especially for the administered, in addition to those explained, we can mention the automation of processes, the digitization of documents, the availability of information regarding government acts and public services available online during the twenty-four hours of the day, These are some communicational technological advances aimed at transparency and perceived in the scope of today's public administration. In this sense, Antônio (2020, p.2), brings that "e-government" (electronic government) constitutes a true pillar in the demand for a transparent governance model, through the sharing of data and disclosure of information on the performance of public powers, facilitating the aforementioned public scrutiny and legal scrutiny".

However, despite the advances observed, challenges are faced daily for there to be a good continuation of the process of implementing a digital public administration, in this sense, Maciel (2020, p. 02) states that "more than 30 years after the new constitutional order, the implementation of digital, informational and participatory governance in Brazil continues to be a challenge, mainly due to bureaucratic barriers, still existing obstacles in the opening of government data and the lack of intelligibility of information and legal language".

In this sense, "there is also a recommendation that studies be carried out on the factors that promote or hinder the adoption of modern ICT tools by municipalities" Sano (2012, p.1-16), in this line, some challenges stand out for their magnitude, on this scale we can highlight the lack of access to the internet and digital skills in certain areas and population groups, especially in rural and remote areas, as they lack an adequate ICT infrastructure, – this creates a "digital gap", preventing the full optimisation of ICT.

Also, within this context, it was possible to observe that, as more sensitive data is stored online, the obstacle related to the issue of cybersecurity becomes clearer and more important, since incidents can expose confidential information and interrupt public services. In addition, the collection and storage of personal data by public agencies raise questions about citizens' privacy and

the proper use of this information, and "cybersecurity needs become even more evident with the increase in the number of incidents in this area that happen in Brazil and in the world" (Nakamura, 2024, p. 296). In addition, we can mention the social issue and the abyssal differences regarding access to new technologies.

In short, although there are still important obstacles to be overcome, in general, substantially positive impacts have been observed in the last decade regarding the implementation of ICT public policies in the Brazilian public administration, and this has been transforming democracy, as there is more transparency regarding government acts, which makes citizenship more exercisable, since, in this sense, tools aimed at social participation are offered to the administered. In this vein, "there is a consensus that ICTs lead to increased government transparency to the extent that they expand the means of publicizing information, automate dissemination processes, and diversify the communication channels between governments, managers, and society" (Frey, 2019, p. 11).

Continuing, in addition to the whole already explained, it is possible to see the improvement, for example, in the quality of services, since the implementation of ICT results in more efficient services, with fewer bureaucratic dysfunctions and reduced corruption, since accountability and transparency reduce opportunities for corruption and consequently cultural changes can be perceived, despite the challenges, since there is currently the promotion of a more technology-oriented approach and process efficiency. In this sense, open government initiatives would greatly contribute to placing the citizen at the center of the process, and not the public servant or the processes, which contributed to a rethinking of hierarchical structures and levels and even the necessary and appropriate formalization of a public organization that serves this individual (Messomo, Wiedenhoft and Santos 2018, p. 289).

In this way, "technological innovations give rise to new important instruments in the public order to promote the effectiveness of public services – as well as clarity of public actions for citizens, emphasizing their effective socio-political participation and offering a good indicator of the development of a people, whether through supervisory councils or transparency portals" (Costa and Souza, 2020, p. 292). Thus, in view of the above, it is emphasized that technological innovation, through ICT instruments, brings a breadth in terms of the control of society and especially in terms of the transparency of government acts. In chart 3, for a better perception, we have presented the main authors and results organized by year of publication in ascending order, that is, from the oldest to the most current.

Chart 3: Main authors and results found

Author	Main results
Balb (2010)	Notwithstanding the governmental effort, at its various levels, the numbers that quantify the users of ICT – notably – the internet – indicate that Brazil still has a lot to progress, since the picture of inequalities existing in Brazilian society, in other areas, is repeated about Information and Communication Technology. (p. 203). The Brazilian government has not yet been able to promote the effective integration of the various bodies that make up the public administration and the sharing of information between the three levels of government and of these two groups with civil society. (p. 203)
Melitsk et al.,(2011)	It identified individual barriers, organizational barriers and strategic barriers involving policies and other external constraints that may inhibit the success of initiatives in the area. Thus, dealing with these barriers and effectively overcoming them requires an integrative approach, a vision of the whole.
Angélico and Teixeira (2012)	The simple access to information that was previously hidden does not automatically allow the elaboration of demands by citizens and organizations, nor does it guarantee that the decision-making process is effectively democratic and that it is based on the construction of understanding based on the collective interest, important pillars for the implementation of Social Management. (p. 24) Communication between subjects emerges as an important tool for Social Management, communication that needs to be mediated by equality of informational resources so that no constraint is able to threaten the construction of an understanding based on collective interest. In this context, understanding how the process of communicative action contributes to reducing informational asymmetry becomes indispensable. (p. 7)
Sano (2012)	In developing or emerging countries, as well as in Brazil, the use of ICT is an especially thorny problem. Poor and small municipalities depend heavily on resources from other levels of government and, on their own, are hardly able to design public policies that benefit from technology. (p. 643) The establishment of a horizontal platform for the management of ICT resources improves the sharing of information, to provide public services, in a more efficient and transparent way (p. 644).
Giaretta and Digiulio (2018)	The diffusion of ICT, especially social networks, has brought to light these experiences that emerge from the network and that, from their virtual interactions, construct meanings and social transformations and transformations of the territories (re)configuring the urban of the twenty-first century. (p. 175) Through ICTs, collective movements engage citizens, drive mobilization, bring to light issues that are apparently silenced, and seek to connect the local with the global. (p. 175)
Messomo, Wiedenhoft and Santos (2018)	Open government initiatives would greatly contribute to placing the citizen at the center of the process, and not the public servant or the processes, which would contribute to a rethinking of hierarchical structures and levels and even of the necessary and adequate formalization of a public organization that serves this individual. (p. 289) An important barrier is the quality of the information, or the lack of it. Respondents do not have full confidence that the data available in Information Systems offer reliable information that can be shared directly with the community without prior analysis. This ends up increasing the risk perceived by public servants in sharing information, as they understand that by opening inaccurate information, they will be responsible for the consequences. (p. 290)

Rezende and Ribeiro (2018)	Although there is no homogeneity, it is possible to perceive an effort to seek to offer municipal information and municipal public services to citizens through information technology resources, considering the implementation of municipal strategies in the various possible themes within the scope of the city. (p. 41) It can be considered that the capitals surveyed are Strategic Digital Cities, mainly because they provide quality of life to citizens, through their four components: municipal strategies, municipal information and municipal public services through information technology resources. (p. 41)
Frey (2019)	The publicization of public information was reconfigured after the advent of the internet and the incorporation of these tools by the public sector. This change required a dedicated look at the way in which the Brazilian public administration incorporated e-government actions, considering the marked heterogeneity between the different levels of power and, in the specific case of municipal administrations, the differences in relation to the size and region of the municipalities (p. 83) In general, it is possible to say that the ICT capacity of city halls interferes with the quality of digital transparency of municipalities. This relationship occurs especially when analyzing the existence of departments within the structure of the municipal administration dedicated exclusively to information and communication technologies. (p. 83) This relationship of dependence between the existence of the IT sector and the quality of municipal transparency is stronger in cities with populations of 10 thousand to 100 thousand inhabitants and is evident in the category of lower transparency. (p. 84) Maturity in IT management and infrastructure is a fundamental element so that the transparency of Brazilian city halls is not too low (p. 85) In order for the concept and applications of transparency to be sophisticated, there must be a minimum level of access to public information in the habitat under analysis. Therefore, in municipalities with very low transparency, the effects of transparency are also limited (p. 85)
Weiss (2019)	The internet has changed the world. Open access to the internet has revolutionized the way individuals communicate and collaborate, how entrepreneurs and corporations conduct their business, and how governments and citizens interact. (p.207). Contemporary society enhances the use of ICTs as a form of communication and interaction, deriving from physical rationality and objectivity a singular form of subjectivity that ranges from the emotional to the festive (p.207).
Zuccolotto and Teixeira (2019)	Even though we still have to advance in the context of transparency in Brazil, much has already been done, so much so that we have recently seen many lawsuits against public administrators. Certainly, the advancement of public transparency is a central factor in this process, which requires mature institutional instruments of accountability and also preconditions for its existence. (p. 69) Despite the advances, the traces of formalism in the transparency of the Brazilian public administration are evident. Many states and municipalities formally comply with the laws, however, when it comes to the quality of the information published, the enormous distance between the concepts and the practice of transparency is soon noticed. (p. 68)
Costa e Souza (2020)	It is observed that the degree of participation of the citizens in the inspection of the administration is unsatisfactory, being a problem for effective social control, which demonstrates the lack of interest or disbelief in the information on the part of the citizens (p. 307)

Maciel (2020)	The cultural and structural barriers identified demonstrate the need to implement and consolidate a governance framework in Brazil that provides legal predictability and security, transforms the opening of data and digitalization of public services into an administrative routine, and enables the sustainability and stability of these initiatives. (p. 14) Transparency and participation are not absolute attributes, but relative ones, and therefore it is possible to have different degrees of transparency and opacity of information and of citizen control and participation, depending on the circumstance. In this sense, there is great disruptive and innovative potential in the use of information and communication technology tools to exponentially increase the degree of transparency, accountability, and social participation, building a solid foundation in the search for the consolidation of digital governance. (p. 14) The digitalization of public management will impact and transform the way government acts, the way services are formulated and provided, and the relations between the State and civil society. It will promote, therefore, a true revolution and reconstruction of Brazilian governance, under new bases that are more transparent, participatory and innovative. (p. 14) Briefly, the obstacles today in the country to the consolidation of digital governance can be classified into two natures: cultural or structural. On the one hand, the current institutional, administrative, and political culture resists and opposes the digitalization of Public Administration. On the other hand, there are technical and structural difficulties that hinder these advances, both those present in the social body (linked to issues of training and access) and in the legal-administrative reality. (p. 8)
Procópio et al., (2020)	Information technology has become an indispensable tool for the implementation of socioeconomic remodeling processes in search of efficiency in promoting the improvement of citizens' living conditions, but the public administration needs to make intensive use of these technologies (p.201). Information technologies keep the public administration connected at all times, evidencing a process of regional restructuring, in which the internet is one of the main factors of change in the various forms of relations (p.201).
Nakamura (2024)	New technologies, such as new protocols, services or platforms, are the pillars of the digital universe, which enable and create waves of economic development. Since the emergence of computers, through the internet, blockchain and other applications, advances have made it possible to merge the physical and the digital (fidigital), which increasingly reflects on human aspects. Cyber risks come together, enhancing the impacts as interdependencies increase (p. 311) New technologies bring with them new risks, including cyber ones. (p.313) In addition to the national cybersecurity strategy, which addresses aspects such as critical infrastructure protection, resilience, and response to cyber incidents, there is an important factor for the digital advancement of countries: the security of the cyber domain, especially with the construction of cybersecurity capabilities. (p. 336) Cybersecurity progress and the strengthening of the security and privacy culture involve the role of government and the need for public policies, together with the continuity of the approximation between senior management and business leaders with cybersecurity professionals (p. 337) With the intensive use of artificial intelligence, attacks tend to be even more sophisticated, with the human factor representing a key element, both for attackers and for the protection of organizations. (p.337)

Source: Authorship (2024)

FINAL CONSIDERATIONS

This study investigated the impact of the implementation of information and communication technologies (ICT) on the transparency of government acts in the Brazilian Public Administration. Thus, considering all the material analyzed, in this context, it became evident that the implementation of Information and Communication Technologies (ICT) has been marked by significant and transformative advances, and the use of these ICT tools has not only provided greater efficiency in terms of public services, but also strongly promotes transparency and citizen participation, strengthening, Thus, democracy and accountability in the public sector.

In this vein, over the years, several agencies, from different governmental spheres, have adopted the concept of Electronic Government, making online services and information available to citizens through ICT tools, which has facilitated access to the administration, making it more convenient, also, the implementation of these tools has contributed to the reduction of bureaucracy and to the improvement of the quality of the services offered, In addition to the promotion of a culture focused on transparency and accountability, this is through the accountability of managers to society.

However, it is important to emphasize that, despite the benefits and advances observed, there are still challenges to be faced and overcome, such as the issue of cybersecurity, digital inclusion and also resistance to change by some actors, in the latter case, there is a cultural issue. In this regard, in view of the facts presented, in order to have a real effectiveness with regard to digital transformation through ICT, in the search for transparency, it is necessary to make an important investment in the individual training of the actors involved, in effective communication and especially in the proper management of the implementation processes in the various governmental spheres.

In addition, the continuous and strategic implementation of ICT in the Brazilian public administration has the potential not only to improve transparency and efficiency, but also to promote a more democratic and responsive governance, since, as highlighted in this study, technology aimed at information and communication is fundamental in the current scenario and its use should be directed to the benefit of the collectivity, empowering citizens and strengthening the relationship between government and society, therefore, the progressive adoption of Information and Communication Technologies in Brazilian public administration represents a promising path for a more efficient, transparent and participatory management.

For all the above, aiming at improving transparency in the Brazilian public administration through the implementation of Information and Communication Technologies (ICT), taking into account the analyses of the articles referenced in this study and the best practices identified, we could affirm that some actions are imperative towards this improvement, such as greater investment in

cybersecurity, in order to protect confidential information and the integrity of databases from malicious attacks.

Furthermore, we can mention, as extremely important – the continuous training of public servants in relation to the proper use of ICT, ensuring that they are able to deal with new technologies and maintain transparency in the management of public data and information; Still, no less important is to guarantee equal access to government information, aiming to ensure that this is a reality in all regions of the country, considering territorial and socioeconomic differences, seeking the consolidation of practices that promote an increasingly effective management and in line with the demands of contemporary society, which yearns for more transparent and less bureaucratic processes.

Finally, in the interest of expanding the study and discussion on the theme in question, since the present study would not be able to exhaust the theme addressed, it is proposed that new studies on the characteristics and applications of ICT, in the sense of promoting transparency, be carried out, and it can be investigated, in this case - since it presents itself as a gap - how citizen participation is being incorporated and implemented by contemporary governments and how much this has impacted the reduction of corruption and the accountability of public managers.

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