

Evaluation of digital accessibility on public platforms for people with disabilities

Evaluación de la accesibilidad digital en plataformas públicas para personas con discapacidad

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ABSTRACT

The study aimed to evaluate the digital accessibility of public platforms from the perception of people with disabilities in Bolivia and Ecuador. The research was developed under a quantitative approach, with a non-experimental, cross-sectional design and descriptive-correlational scope. The sample consisted of 128 people with disabilities who had used public digital platforms to consult information, carry out procedures or access institutional services. A structured survey with a five-level Likert scale was applied for data collection, organized into dimensions of ease of navigation, clarity of information, compatibility with assistive technologies, access to online procedures, autonomy of use, and perceived digital inclusion. Previously, a pilot test was carried out and the reliability of the instrument was verified by Cronbach's alpha, obtaining a value of 0.82. The results showed low and medium levels of digital accessibility, with greater difficulties in autonomous navigation, accessible forms, clear institutional language and technological compatibility. In addition, Spearman's correlation confirmed a positive and significant relationship between perceived digital accessibility and digital inclusion. It is concluded that the digital transformation of the public sector in Bolivia and Ecuador should strengthen inclusive design, the permanent evaluation of platforms and the participation of users with disabilities in improvement processes.

Keywords: digital accessibility; public platforms; disability; digital inclusion; e-government.

RESUMEN

El estudio tuvo como objetivo evaluar la accesibilidad digital de plataformas públicas desde la percepción de personas con discapacidad de Bolivia y Ecuador. La investigación se desarrolló bajo un enfoque cuantitativo, con diseño no experimental, transversal y alcance descriptivo-correlacional. La muestra estuvo conformada por 128 personas con discapacidad que habían utilizado plataformas digitales públicas para consultar información, realizar trámites o acceder a servicios institucionales. Para la recolección de datos se aplicó una encuesta estructurada con escala de Likert de cinco niveles, organizada en dimensiones de facilidad de navegación, claridad de la información, compatibilidad con tecnologías de apoyo, acceso a trámites en línea, autonomía de uso e inclusión digital percibida. Previamente, se realizó una prueba piloto y la confiabilidad del instrumento fue comprobada mediante Alfa de Cronbach, obteniéndose un valor de 0.82. Los resultados evidenciaron niveles bajos y medios de accesibilidad digital, con mayores dificultades en la navegación autónoma, formularios accesibles, lenguaje institucional claro y compatibilidad tecnológica. Además, la correlación de Spearman confirmó una relación positiva y significativa entre accesibilidad digital percibida e inclusión digital. Se concluye que la transformación digital del sector público en Bolivia y Ecuador debe fortalecer el diseño inclusivo, la evaluación permanente de plataformas y la participación de usuarios con discapacidad en los procesos de mejora.

Palabras clave: accesibilidad digital; plataformas públicas; discapacidad; inclusión digital; gobierno electrónico.

1. INTRODUCTION

The digital transformation of the public sector has changed the way citizens access information, procedures and institutional services. This process has made it possible to expand the channels of attention and reduce dependence on face-to-face attendance; however, it has not always guaranteed a level playing field for all users. For people with disabilities, access to digital environments may be limited by non-inclusive designs, content that is difficult to understand, forms that are incompatible with assistive technologies, or navigation processes that require external assistance. Therefore, digital accessibility is a necessary condition to ensure autonomy, citizen participation and effective exercise of the right to information.

Janowski (2015) argues that digital government is not reduced to incorporating technology into public management, but involves transforming services according to the context and needs of the population. This vision allows us to understand that state digitalization must go beyond publishing information online, as it requires functional, understandable and usable services for different user profiles. In a complementary way, Malodia et al. (2021) point out that the development of e-government depends on the integration between technological infrastructure, institutional trust, quality of service, and citizen participation.

Web accessibility is understood as the possibility for anyone to perceive, understand, navigate and interact with digital content, regardless of their physical, sensory, cognitive or technological conditions. Manzoor and Vimarlund (2018) indicate that digital technologies can promote the social inclusion of people with disabilities when they respond to their real needs. Along the same lines, the literature recognizes that digital accessibility represents both a technical challenge and an opportunity to build more equitable services (Kulkarni, 2019).

Various studies have shown that government sites still have problems with usability, mobile compatibility and compliance with accessible standards. Agrawal et al. (2022) identified limitations in India's e-government portals, especially in navigation, accessibility, and mobile readiness. These findings coincide with research carried out in other countries, where similar difficulties were observed in state portals, even in contexts with greater technological progress (Al-Khalifa et al., 2017; Csontos & Heckl, 2021). This shows that the existence of digital services does not in itself guarantee an inclusive experience.

The problem does not correspond only to a specific region or level of development. Ismailova (2017) found accessibility, usability, and security deficiencies in government sites in Kyrgyzstan, while Kesswani and Kumar (2022) evidenced relevant differences in compliance with accessible criteria between G7 and BRICS countries. This background shows that the quality of digital services must be analyzed not only from their availability, but also from the real possibility of use by people with different conditions.

Compliance with international standards, such as the Web Content Accessibility Guidelines, is essential to assess the inclusive quality of institutional environments. Paul (2022) evidenced, through an analysis based on WCAG 2.1, that several e-government platforms maintain obstacles that affect the navigation and understanding of content. Similarly, Al-Sakran and Alsudairi (2021) highlight that accessibility should also be considered in mobile interfaces, due to the growing use of smartphones to access public services.

Technical evaluation is necessary, but not sufficient to understand the real experience of users. AlSaeed et al. (2020) analyzed e-government systems from the perspective of visually impaired people and demonstrated that their perceptions allow them to identify problems that are often not visible in automatic diagnoses. In the field of public health, Alajarmeh (2022) also highlights the importance of guaranteeing accessible sites so that institutional information can be consulted by the entire population. Therefore, the user's perspective becomes key to assessing the effectiveness of inclusive digital services.

In Latin America, this issue acquires special relevance due to the persistence of social, technological and territorial inequalities. Campoverde-Molina and Valverde (2019) identified accessibility limitations in institutional portals in Ecuador, which shows the need to strengthen inclusive design in digital spaces for public use. Although his research focused on educational institutions, his results allow us to recognize problems applicable to other state services, especially in countries where digitalization advances along with connectivity and digital literacy gaps.

The digital divide affects people with disabilities differently, not only because of access to devices or the internet, but also because of the way in which online services are designed. Kolotouchkina et al. (2022) warn that smart cities and digital services can widen inequality when they do not consider the needs of these groups. Consequently, accessibility is directly linked to social justice, citizen participation and the right to public information.

Another relevant aspect is the technical and institutional capacity of those who develop and manage digital environments. Alghamdi et al. (2024) point out that developers face difficulties associated with knowledge of standards, application of best practices, and resolution of web accessibility issues. This shows that the limitations do not only originate in the final design of a page, but also in planning, training and technological maintenance processes.

Despite the growth of studies on e-government and web accessibility, there is still little empirical evidence focused on the direct perception of people with disabilities in Latin American countries. Most research has focused on technical evaluations or comparisons between websites, while less frequent studies that analyse how users value navigation, clarity of information, compatibility with assistive technologies and autonomy to carry out digital procedures. This gap justifies the need for research that incorporates the experience of those who face these conditions into their daily use.

In this context, the present research aims to evaluate the digital accessibility of public platforms from the perception of people with disabilities in Bolivia and Ecuador. To this end, a structured survey with a Likert scale will be applied to a sample of 128 participants, considering dimensions related to ease of navigation, understanding of information, compatibility with assistive technologies, access to online procedures, autonomy of use and perceived digital inclusion. The reliability of the instrument will be verified using Cronbach's Alpha, with a value of 0.82, supported by a previous pilot test aimed at verifying the clarity and relevance of the items. With this, the study seeks to provide useful evidence to improve the design of more inclusive public digital services focused on the real needs of people with disabilities.

2. METHODOLOGY

The research was developed under a quantitative approach, because numerical data obtained through a structured survey were collected and analyzed. The design was non-experimental, since the study variables were not manipulated, but the perceptions of the participants were observed in their real context of use. In addition, it had a cross-sectional scope, because the information was collected at a single time, and a descriptive-correlational scope, aimed at

characterizing perceived digital accessibility and analyzing the relationship between its main dimensions.

The population of interest was made up of people with disabilities from Bolivia and Ecuador who had used public digital platforms to consult information, carry out procedures, access institutional services or interact with state entities. The sample consisted of 128 participants, selected through non-probabilistic convenience sampling. The inclusion criteria were to be a person with a disability, reside in Bolivia or Ecuador, have previous experience in the use of public digital platforms and voluntarily accept their participation in the study.

A structured questionnaire with a five-level Likert scale was designed for information collection, where 1 represented "strongly disagree" and 5 "strongly agree". The instrument made it possible to measure the perception of digital accessibility based on dimensions related to ease of navigation, clarity of information, compatibility with assistive technologies, access to online procedures, autonomy of use and perceived digital inclusion. The items were written in clear language, trying to make them understandable to the participants and consistent with the objective of the research.

Before the final application, a pilot test was carried out with a small group of people with similar characteristics to the final sample. This phase allowed us to verify the clarity of the questions, the relevance of the dimensions, the time required to answer the questionnaire and possible difficulties in comprehension. Based on the results obtained in the pilot test, minor adjustments were made in the wording of some items, in order to improve the accuracy of the instrument and avoid ambiguities in the answers.

The validity of the questionnaire was reviewed through expert judgment, who evaluated the coherence between the items, the dimensions proposed, and the objective of the study. This process made it possible to verify that the questions were relevant to assess digital accessibility on public platforms from the perception of people with disabilities. The internal reliability of the instrument was verified using Cronbach's alpha coefficient, obtaining a value of 0.82, which evidenced an adequate internal consistency for the application of the questionnaire in the selected sample.

The data collection procedure was carried out by applying the survey to the 128 participants from Bolivia and Ecuador. Previously, the purpose of the study, the voluntary nature of participation and the confidentiality of the information collected were explained. The

responses were organized in a database for subsequent statistical processing, taking care that the information was kept anonymous and used only for academic purposes.

For the analysis of the data, descriptive statistics were used, such as frequencies, percentages, means and standard deviations, in order to identify the levels of perception in each dimension evaluated. In addition, due to the ordinal nature of the Likert scale, Spearman's correlation was applied to analyze the relationship between perceived digital accessibility, autonomy of use, and digital inclusion. This analysis made it possible to determine whether the dimensions evaluated maintained significant associations with each other and provided evidence to respond to the objective of the research.

From an ethical point of view, the study respected the principles of voluntary participation, confidentiality and responsible use of information. Participants were informed about the purpose of the research and were free to decide whether they wished to answer the questionnaire. No sensitive personal data was requested to directly identify the participants, thus guaranteeing anonymity and protection of the information collected.

3. RESULTS

The results were organized according to the dimensions evaluated in the survey applied to 128 people with disabilities from Bolivia and Ecuador. The Likert scale used allowed us to identify the level of agreement of the participants regarding the digital accessibility of public platforms, considering aspects related to navigation, clarity of information, compatibility with assistive technologies, online procedures, autonomy of use and perceived digital inclusion.

Table 1

Instrument reliability using Cronbach's alpha

Dimension evaluated	Number of items	Cronbach's alpha
Ease of navigation	4	0.80
Clarity of information	4	0.79
Support for assistive technologies	4	0.83
Access to online procedures	4	0.81
Autonomy of use	4	0.84

Perceived digital inclusion	4	0.82
General instrument	24	0.82

Note. The general value of 0.82 shows an adequate internal consistency of the instrument applied.

The reliability of the questionnaire presented an overall Cronbach's alpha value of 0.82, indicating adequate internal consistency. The dimensions evaluated obtained values between 0.79 and 0.84, which demonstrates stability in the answers and coherence between the items. This result supports the relevance of the instrument to measure the perception of digital accessibility on public platforms from the experience of people with disabilities.

Table 2
Perception of ease of navigation on public platforms

Item evaluated	Media	Standard deviation	Interpretive level
The platform makes it easy to find information	3.12	1.08	Medium
Menus and links are understandable	3.05	1.11	Medium
Navigation can be done without the help of another person	2.89	1.16	Low
Site structure makes it easy to complete actions	2.96	1.13	Low
Dimension Average	3.01	1.12	Medium

Note. The dimension shows an intermediate perception, with greater difficulties in autonomous navigation.

The results show that ease of navigation obtained an overall average of 3.01, located at a medium level. Although some participants pointed out that they can find basic information within the platforms, there are also difficulties in navigating without external support. The item with the lowest rating was the possibility of browsing autonomously, with an average of 2.89, which reflects that a part of the users still depend on assistance to complete digital actions in public services.

Table 3
Clarity of information and support for assistive technologies

Item evaluated	Media		Standard deviation	Interpretive level
Information is presented in clear language	3.18	1.04		Medium
The texts are understandable to the user	3.09	1.07		Medium
The platform works well with assistive technologies	2.76	1.18		Low
Forms are accessible to people with disabilities	2.71	1.20		Low
Dimension Average	2.94	1.12		Low

Note. The results reflect greater limitations in technological compatibility and accessibility of forms.

The dimension related to clarity of information and compatibility with assistive technologies presented an average of 2.94, which represents a low level. Although language clarity obtained average values, the items associated with the operation with assistive technologies and accessibility of forms reached the lowest averages. This shows that public platforms do not always respond adequately to the needs of people who use screen readers, enlargers, voice commands or other digital assistance resources.

Table 4
Digital barriers perceived by people with disabilities

Barrier identified	Frequency	Percentage
Hard-to-fill forms	37	28.9%
Unclear or highly technical information	29	22.7%
Lack of support for assistive technologies	26	20.3%
Confusing menus or links	19	14.8%
Difficulty finding paperwork or services	17	13.3%
Total	128	100%

Note. The main barriers are related to forms, institutional language and technological compatibility.

The most frequent barriers were difficult-to-complete forms, reported by 28.9% of participants, followed by unclear or highly technical information, with 22.7%. The lack of compatibility with assistive technologies was also identified as a relevant problem, indicated by 20.3%. These results indicate that the limitations are not only concentrated in the visual structure of the sites, but also in the way in which digital processes are organized and institutional information is presented.

Table 5
Perception of autonomy of use and digital inclusion

Item evaluated	Media		Standard deviation	Interpretive level
I can carry out digital procedures without help	2.82	1.15		Low
Public platforms save me time	3.21	1.06		Medium
I feel included in the State's digital services	2.88	1.17		Low
The platforms respond to my needs as a person with disabilities	2.74	1.19		Low
Dimension Average	2.91	1.14		Low

Note. Autonomy and perceived digital inclusion have low values, especially in terms of adaptation to specific needs.

Autonomy of use and perceived digital inclusion reached an average of 2.91, located at a low level. The most critical result was observed in the item referring to whether the platforms respond to the needs of people with disabilities, with an average of 2.74. This suggests that, although digital services can represent a useful alternative to reduce times and journeys, they still do not guarantee a fully inclusive and autonomous experience for all users.

Table 6
Spearman's correlation between dimensions of digital accessibility

Relationship analyzed	Spearman's Rho	Bilateral Sig.	Interpretation
Ease of navigation – Autonomy of use	0.58	0.000	Moderate-positive relationship

Technology Compatibility – Perceived Digital Inclusion	0.61	0.000	Moderate-positive relationship
Clarity of information – Autonomy of use	0.49	0.001	Moderate-positive relationship
Access to online procedures – Perceived digital inclusion	0.55	0.000	Moderate-positive relationship
Overall Digital Accessibility – Perceived Digital Inclusion	0.64	0.000	Significant positive relationship

Note. The correlation was significant at the 0.01 level.

The correlational analysis using Spearman evidenced positive and significant relationships between the dimensions evaluated. The highest relationship was presented between general digital accessibility and perceived digital inclusion, with a coefficient of 0.64 and significance of 0.000. This indicates that the greater the perception of accessibility on public platforms, the greater the perception of digital inclusion by people with disabilities. A relevant relationship was also observed between technological compatibility and perceived digital inclusion, with a coefficient of 0.61, confirming the importance of adapting digital services to assistive technologies.

Overall, the results show that the public platforms evaluated present a low to medium level of digital accessibility from the perception of people with disabilities in Bolivia and Ecuador. The main difficulties relate to autonomous navigation, accessibility of forms, compatibility with assistive technologies and clarity of institutional information. In addition, the correlations obtained allow us to accept the research hypothesis, as a significant relationship between perceived digital accessibility and digital inclusion has been verified.

4. DISCUSSION

The results obtained show that the digital accessibility of public platforms, from the perception of people with disabilities in Bolivia and Ecuador, is between low and medium levels. This finding shows that the digitization of state services alone does not guarantee an inclusive experience, especially when digital environments present navigation difficulties, inaccessible forms, complex institutional language, and low compatibility with assistive technologies. In this sense, accessibility should be understood as a necessary condition for

people with disabilities to be able to exercise their right to information, participation and the use of digital public services autonomously.

The dimension of ease of navigation presented a medium level, although with important weaknesses in the possibility of performing actions without the help of third parties. This result coincides with Janusz et al. (2023), who point out that the accessibility of public institutions does not depend only on the existence of available services, but on the real capacity of people with specific needs to use them in appropriate conditions. In this way, when a platform requires constant assistance, the user's autonomy is reduced and the inclusive sense of the digital service is limited.

The results also showed difficulties in the clarity of the information and in the organization of the contents. This situation is related to what Sánchez Vanderkast (2013) pointed out, who stresses that access to government information should not be analyzed only from the availability of documents or data, but from the conditions that allow citizens to understand and use them. Therefore, online public information must be presented with clear language, logical structure and accessible formats, especially when it is aimed at users with different sensory, cognitive or technological conditions.

One of the most relevant limitations identified was the low compatibility with assistive technologies, such as screen readers, enlargers, voice commands or other digital assistance resources. This finding coincides with previous studies that warn that many institutional platforms maintain design errors that affect the interaction of people with disabilities, even when the content is formally available online (Mañez Carvajal, 2020; Casasola Balsells et al., 2019). Consequently, accessibility cannot be limited to publishing information in digital media, but must guarantee real conditions of interaction with the systems.

The most frequent barriers identified by participants were difficult-to-complete forms, unclear technical information and lack of technological compatibility. These results allow us to understand that the main difficulties are not only concentrated in the initial access to the platforms, but also in the completion of procedures and processes. Chemnad and Othman (2024) argue that digital accessibility has become more complex in the era of artificial intelligence and advanced technological environments, because systems must adapt to different user profiles and not only meet minimum technical criteria. From this perspective, digital public services require permanent processes of evaluation and improvement.

The low valuation of autonomy of use and perceived digital inclusion demonstrates that people with disabilities have not yet fully experienced the benefits of the digital transformation of the public sector. While online services can reduce travel, costs, and wait times, these benefits are weakened when platforms don't respond to specific needs. This interpretation is related to what Vidal-Alaball et al. (2023) propose, who argue that digital transformation should be aimed at reducing the digital divide and not at deepening existing inequalities. Therefore, digital inclusion requires technical accessibility, communicational clarity and institutional support.

From a social perspective, the results reflect that digital accessibility must be linked to broader inclusion processes. Cubillos-Bravo and Avello-Sáez (2022) highlight that assistive technologies can strengthen rehabilitation, autonomy, and social participation when properly integrated into everyday environments. In the case of public platforms, this implies that the systems must be compatible with such technologies and allow people with disabilities to carry out procedures or consultations without permanently depending on another person. Digital autonomy, therefore, is not only a technical indicator, but also an expression of social inclusion.

The correlational analysis confirmed a positive and significant relationship between general digital accessibility and perceived digital inclusion. This result indicates that, when users perceive greater ease of navigation, better clarity of information and greater technological compatibility, their feeling of inclusion in the State's digital services also increases. This relationship coincides with Park et al. (2023), who show that access to and use of information technologies can be related to better conditions of well-being in vulnerable populations, provided that there are adequate conditions of access and use. In this study, accessibility appears as a key factor for public digitalisation to have a truly inclusive effect.

The findings also coincide with Alajarmeh (2022), who warns that public sites linked to essential services, such as health, must ensure accessibility to prevent certain groups from being excluded from relevant information. Although this research focuses on public platforms in general, the principle is similar: when digital environments are not accessible, the possibility of exercising rights, resolving procedures or accessing institutional services is limited. Therefore, accessibility must be considered a cross-cutting criterion in the design, evaluation and updating of state digital services.

Overall, the discussion allows us to argue that the public platforms analyzed still present significant challenges in responding to the needs of people with disabilities in Bolivia and Ecuador. The results not only show technical difficulties, but also problems of communication, institutional design and user experience. For this reason, it is necessary to strengthen the application of accessibility standards, incorporate tests with real users, improve compatibility with assistive technologies and simplify digital processes. In this way, the digital transformation of the public sector will be able to move towards a more inclusive model, focused on autonomy and the right of all people to participate fully in digital life.

5. CONCLUSIONS

The research showed that the digital accessibility of public platforms, from the perception of people with disabilities in Bolivia and Ecuador, is at low and medium levels. Although digital services represent an important alternative to access information and state procedures, there are still difficulties that limit an autonomous, clear and inclusive experience for this group of users.

The results show that the main barriers are related to forms that are difficult to complete, unclear institutional information, confusing menus and low compatibility with assistive technologies. These limitations directly affect the autonomy of people with disabilities, as they often require external help to complete processes that should be able to be carried out independently.

The reliability of the instrument, verified by means of a Cronbach's alpha of 0.82, supports the consistency of the survey applied and allows us to maintain that the dimensions evaluated were adequate to measure the perception of digital accessibility. The pilot also contributed to improving the clarity of the items and strengthening the methodological relevance of the study.

The correlational analysis confirmed a positive and significant relationship between perceived digital accessibility and digital inclusion. This shows that, when public platforms are easier to use, understandable and compatible with assistive technologies, people with disabilities perceive greater conditions of inclusion, autonomy and participation in the State's digital services.

In practical terms, it is concluded that Bolivia and Ecuador should strengthen the permanent evaluation of their public platforms, incorporating international standards of accessibility and testing with real users. The digital transformation of the public sector should not be limited to transferring procedures to the internet, but should ensure that these services can be used by all people on equal terms.

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