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ICT Appropriation in a Regional Superintendence of Labor – Analysis of Efficiency and User Satisfaction [1]

Apropriação de TICs em uma superintendência regional do trabalho – Análise da eficiência e da satisfação do usuário

Apropiación de las TIC en una Superintendencia Regional del Trabajo – Análisis de la Eficiencia y la Satisfacción de los Usuarios

ABSTRACT

The appropriation of Information and Communication Technologies (ICTs) in public administration has transformed the interaction between government and citizens, allowing greater efficiency and accessibility. This study examines the use of ICTs in a Regional Superintendence of Labor (RST) in Brazil, focusing on the CTPS Digital application and the Electronic Contact Form. Our goal is to investigate how ICTs can strengthen the principle of efficiency in public management, raising the quality of citizen service. The research adopts a mixed approach, integrating interviews with RST employees, application of questionnaires to users, and document analysis. The SERVPERF model was used to evaluate the quality of digital services, and quantitative data analysis was performed in the R software. As results, we point out that ICTs contribute to the efficiency and agility of services, but the current modeling presents fragility of security and accessibility, requiring continuous human intervention. The research suggests the need to improve digital services' modeling, strengthen platforms' security, and promote users' digital inclusion.

Keywords: Public administration; Information and communication technologies; Government; Information Management; Quality.

RESUMO

A apropriação de Tecnologias da Informação e Comunicação (TICs) na administração pública vem transformando a interação entre o governo e os cidadãos, permitindo maior eficiência e acessibilidade. Este estudo examina o uso das TICs em uma Superintendência Regional do Trabalho (SRT) em um estado do Brasi, com foco no aplicativo CTPS Digital e no Formulário Eletrônico de Contatos (FEC). O objetivo é investigar como as TICs podem fortalecer o princípio da eficiência na gestão pública, elevando a qualidade do atendimento ao cidadão. A pesquisa adota uma abordagem mista, integrando entrevistas com servidores da SRT, aplicação de questionários aos usuários e análise documental. O modelo SERVPERF foi utilizado para avaliar a qualidade dos serviços digitais, e a análise dos dados quantitativos foi realizada no software R. Como resultados, apontamos que qs TICs contribuem para a eficiência e agilidade dos serviços, mas a modelagem atual apresenta fragilidade de segurança e acessibilidade, requerendo intervenção humana contínua. A pesquisa sugere a necessidade de aprimorar a modelagem dos serviços digitais, fortalecer a segurança das plataformas e promover a inclusão digital dos usuários.

Palavras-chave: Administração pública; Tecnologias da informação e comunicação; Governo; Gestão da Informação; Qualidade.

RESUMEN

La apropiación de las Tecnologías de la Información y las Comunicaciones (TIC) en la gestión pública ha venido transformando la interacción entre gobierno y ciudadanía, permitiendo una mayor eficiencia y accesibilidad. Este estudio examina el uso de las TIC en una Superintendencia Regional del Trabajo (SRT) en un estado de Brasil, centrándose en la aplicación CTPS Digital y el Formulario Electrónico de Contacto (FEC). Nuestro objetivo es investigar cómo las TIC pueden fortalecer el principio de eficiencia en la gestión pública, elevando la calidad del servicio al ciudadano. La investigación adopta un enfoque mixto, integrando entrevistas con empleados de SRT, aplicación de cuestionarios a los usuarios y análisis de documentos. Para evaluar la calidad de los servicios digitales se utilizó el modelo SERVPERF, y el análisis de datos cuantitativos se realizó en el software R. Los resultados apuntan que las TIC contribuyen a la eficiencia y agilidad de los servicios, pero la modelización actual presenta fragilidad de seguridad y accesibilidad, requiriendo una intervención humana continua. La investigación sugiere la necesidad de mejorar la modelación de los servicios digitales, fortalecer la seguridad de las plataformas y promover la inclusión digital de los usuarios.

Palabras clave: Administración pública; Tecnologías de la información y las comunicaciones; Gobierno; Gestión de la Información; Calidad.

Introduction

Adopting information and communication technologies (ICT) has transformed public administration in several countries, including Brazil, offering tools and platforms that promote efficiency and transparency in citizen services. Digital transformation allows for a more integrated and faster relationship between government and citizens, allowing the provision of services that are accessible, agile, and transparent. In this text, the term 'accessibility' is used in its technical sense, referring specifically to removing barriers that prevent people with disabilities from effectively using digital platforms and services, following the Web Content Accessibility Guidelines (WCAG) and related standards. The Brazilian Digital Governance Policy, established by Decrees Nos. 8,936/2016 and 10,332/2020 are reflected in the creation of digital citizenship platforms, such as the Gov.br Portal, which facilitates access to state services in line with the principles of efficiency, economy, and digital accessibility.

The Regional Superintendence of Labor (SRT), linked to the Ministry of Labor and Social Security, is an example of the incorporation of ICTs in Brazilian public administration. SRT adopts digital tools such as the "Digital Employment and Social Security Card (CTPS)" application, which replaces paper documents and allows workers to access records of employment relationships and benefits, such as unemployment insurance and salary bonuses. The Electronic Contact Form (ECF) complements Digital CTPS, providing a direct channel for communication with SRT in situations that require support or human intervention. These tools are designed to optimize resources and improve the quality of service for citizens, enabling access to public services without frequent travel.

Despite these advances, the digitalization of public services faces challenges regarding security and digital inclusion (Silva, 2023). Using ICTs in public administration can compromise accessibility for some population groups, especially those with low digital proficiency, generating a new type of inequality in service access (Reinsalu, 2022). Issues related to the security and protection of personal data are relevant to providing digital services. Platforms must balance accessibility and security, which requires continuous investment in security protocols and digital literacy practices to enable the public to use them effectively.

This study is part of the debate on the limits and possibilities of technological mediation of SRT public services, given the regional and social differences in the universalization of digital platforms for user services of Brazil's Ministry of Labor and Social Security. The analysis is directed at the impact of digital CTPS and ECF in reducing waiting times and improving user satisfaction, besides discussing the implementation of ICTs within the scope of SRT.

The research questions are as follows: How does incorporating ICTs contribute to the management of services provided by SRT? This study analyzes workers' perceptions of implementing digital tools, user satisfaction, and differences in online and digital service flows. The focus on the impacts of digital literacy on the digitalization of services allows an understanding of the application of ICTs in the public sector.

Literature review

Digitalization represents an extension of the managerialist model applied to the public sector using tools to modernize the relationship between the state and citizens (Franco, 2024), aiming to increase transparency and accessibility to services (Lourenço Andrade; Souza, 2020).

Information sharing between hierarchical levels facilitates decision-making and public policy implementation (Pan; Zhang, 2022). Efficient management of public organizations is associated with a culture of transparency and communication that recognizes information as a resource to be shared among the actors involved in the governance process (Marcolino, 2024).

The interaction between governments, public institutions, and citizens has been strengthened using ICTs, which expands the channels for disseminating information and encourages greater engagement and social participation (Dias, 2019). Using ICTs in governance tends to increase the perception of the quality of services (Foweraker, 2021) by promoting citizen protagonism in accelerating organizational processes (Afiyah, 2024).

The *citizen-driven* model involves the implementation of participatory processes in decision-making, promoting greater alignment between public policies and social demands (Trung, 2024). The government adapts services to the opinions and needs of service users based on practices, such as using open data and multiple communication channels. Open data encourages collaboration between organizations and public management actors, stimulates innovation, and contributes to developing solutions more responsive to society's needs (Café *et al.*, 2022). Part of the model contemplates the diversity of communication channels. It includes formal spaces for participation, such as councils, forums, and public hearings, which strengthen dialogue between the government and civil society. Digital platforms that centralize information at a single access point contribute to cost-effectiveness (Krasnykov *et al.*, 2024) and improve efficiency in the provision of public services (Parinusa *et al.*, 2024). In short, the model integrates transparency, participation, and innovation as central elements in public governance.

The concept of digital governance in Brazil is reflected in the *Gov.br Portal*, which integrates services and information from public agencies. The citizens' experience in accessing processes, which previously required travel to a public agency, is optimized by reducing waiting times. Ultimately, the benefits of providing public services, aimed at an agile and satisfactory response to citizens' needs, impact the use of public resources (Bower, 2023).

Digital Governance and SRT

SRT has incorporated ICTs as part of its employee service strategy, emphasizing using the CTPS Digital application and the ECF. ICTs are part of the digital government context as they reduce the need for in-person services. CTPS Digital replaced the physical work card, allowing citizens to access employment records and apply for benefits. The ECF complements CTPS Digital, serving as a channel between the employee and SRT, especially in cases requiring human intervention. However, SRT faces challenges in implementing Digital Governance, such as the need for an authentication system and the adequacy of technological infrastructure to guarantee universal access.

Security in handling and storing personal data is a central issue to be addressed, including protecting users against threats, such as information interception, identity theft, and unauthorized access. (Gulyamov; Raimberdiyev, 2023). The CTPS Digital application, for example, uses the *Gov.br* login, but ECF still lacks an equivalent authentication system, which exposes the platform to security risks and vulnerabilities. It is worth noting that the additional security layer contributes to a better user experience of the system and interoperability between digital services (Linden *et al.*, 2024).

Another aspect that influences using ICTs in Brazil is the low level of digital literacy among users and inequalities in access due to the cost of internet use. While Nguyen et al. (2024)

analyze these challenges in the context of a different country, the issues identified, such as limited digital skills and high connectivity costs, are also observed in the Brazilian context, as discussed in this study. Inequalities in access to ICTs represent a limitation in digital government, as many citizens face difficulties in using digital platforms because of a lack of technical skills or adequate infrastructure, such as access to quality Internet. Without digital inclusion actions, segments of the population are excluded from accessing digital platforms, demonstrating a lack of compliance with public service principles (Schiefler; Cristóvam; Sousa, 2020).

An alternative way to serve individuals with less digital familiarity or in situations that require direct interaction is to integrate digital and in-person channels. The inclusion of citizens as partners in government activities can be operationalized through infrastructure that enables access to government electronic services, contributing to the reduction of the digital divide (Wiley; Goulding, 2023).

Recognizing user limitations in access or digital knowledge should not hinder the evolution of the digital transformation of services. Management can implement facilitating instruments through technological infrastructure or digital literacy processes, which tend to influence the engagement and acceptance of services (Sahur; Amiruddin, 2023). The propensity for adoption increases when users understand the benefits of services and receive adequate support (Abouelfaiz, 2024).

When designed in an integrative manner, the use of multichannel in citizen service enhances the efficiency of public services and raises levels of satisfaction and transparency (Ducci; Materassi; Solito, 2020). Providing multiple access points to public services offers citizens greater convenience and flexibility, promoting an inclusive experience and expanding accessibility, especially for people with special needs or living in remote areas. However, for effective implementation, the multichannel service strategy requires a centralized guideline that ensures both the integration of systems and the continued qualification of the staff to meet demands in the channels offered adequately.

Methodology

This study adopts a mixed approach to examine the effectiveness of ICTs in an SRT, focusing on using the CTPS Digital application and ECF. The methodological choice aimed to ensure accuracy in data analysis and facilitate the visualization of patterns, allowing the identification of both potentialities and limitations in SRT's digital service flows.

Semi-structured interviews were conducted with three SRT workers representing different activity levels to collect qualitative data: national management, regional management, and user service (TABLE 1).

Table 1. Profile of Interviewees

Interview-ee	Education	Organizational Section	Time in SRT (in years)	Time in Labor Policies (years)
E1	Master's degree	General Coordination of Benefit Management (National)	34	15
E2	Undergraduate	Labor Policies Section	45	25
E3	Undergraduate	Administrative Sector	13	13

Source: Authors, field research

The quantitative study was developed by applying a structured questionnaire based on the SERVPERF model, allowing the assessment of user satisfaction with the services. The SERVPERF model was selected due to its focus on measuring service performance, which is defined as the user's perception of the actual quality delivered by the service provider. Unlike the SERVQUAL model, which assesses the gap between expectations and perceptions, SERVPERF evaluates only the performance dimension, thus providing a more direct and reliable assessment of service quality (Fu *et al.*, 2022). SERVPERF has been widely adopted in public service contexts for its internal consistency and ability to inform improvement plans and public policies (Michael *et al.*, 2023). Its main advantages include a reduced number of items, which simplifies application and minimizes respondent fatigue, while maintaining statistical validity quality (Fu *et al.*, 2022). It makes it particularly suitable for evaluating the quality of digital services provided by SRT, where performance and user satisfaction are central concerns.

A pre-test was conducted with ten respondents who did not identify any problems and validated the construction. Subsequently, the questionnaire was distributed electronically to 414 users of services such as unemployment insurance and Salary bonuses. A dichotomous scale, ranging from "Totally Disagree" to "Totally Agree," was used, with the dimensions of tangibility, reliability, responsiveness, security, and empathy in the digital services provided. Quantitative data analysis was conducted using the R programming language.

Results

The analysis of the interviews revealed that the strategy for incorporating ICTs into SRT depends on preparing users and employees to use digital tools effectively. According to E1, adopting CTPS Digital and ECF applications is necessary to increase service efficiency. He highlighted the need for ongoing digital literacy actions so that all users can operate the systems easily and safely, corroborating the vision of helping citizens enjoy public services independently.

Another point is the need for continuous remodeling of internal processes. SRT constantly seeks to adapt and integrate new digital tools into service flows to improve the user experience. However, as E1 noted, the transition is not without difficulties. The lack of centralized guidelines for digitalization in a national network, which includes other SRT units, the National Employment System (SINE), city halls, and the "Alô Trabalho" Center, compromises the uniformity of services. The interviewee said that the appropriation of technological solutions occurs differently between different regional units, creating variations and causing inconsistencies in the service.

Regarding digital inclusion, the interviewees agreed on the importance of maintaining in-person services to serve a portion of the population facing difficulties using ICTs. The comparison between in-person and digital service flows highlights the efficiency gains in digital services, such as reduced response time and the need for human interaction, particularly in services such as unemployment insurance and salary bonuses. In-person service waiting times are longer than digital services, which speeds up service flow and reduces dependence on human intervention. ECF is used to resolve specific issues that digital systems do not cover, thereby demonstrating the limitations of the current modeling of SRT digital services.

Security has emerged as one of the central aspects of ICT implementation. Interviewees expressed concerns about credential fraud and misuse of user data. Participant E3 reported

incidents involving password leaks, emphasizing the need to improve the security of citizens' data on SRT digital platforms. This recommendation is supported by E1, who suggests strengthening authentication measures, balancing protection and usability, and investing in advanced security technologies.

Another aspect mentioned by the participants was the lack of integration between the SRT service channels, which can harm the user experience. Interviewee E1 highlighted the need to consolidate and coordinate digital and in-person channels to avoid duplication of efforts and improve communication between different contact points. He argued that the lack of integration creates barriers for users to find quick and effective solutions to their demands, impacting the perception of digital services' quality. In E3's view, SRT should expand social networks and other means to inform citizens about available services and the features offered by applications, promoting greater adoption of digital services.

A survey of users of SRT services revealed that the level of education is directly related to the ability to deal with digital technologies, influencing the use and evaluation of public services offered by online platforms. Participants with a higher education (H.E.) degree (28.4%) showed greater familiarity with the use of technologies and a greater ability to search for processes and use information effectively (Figure 1).
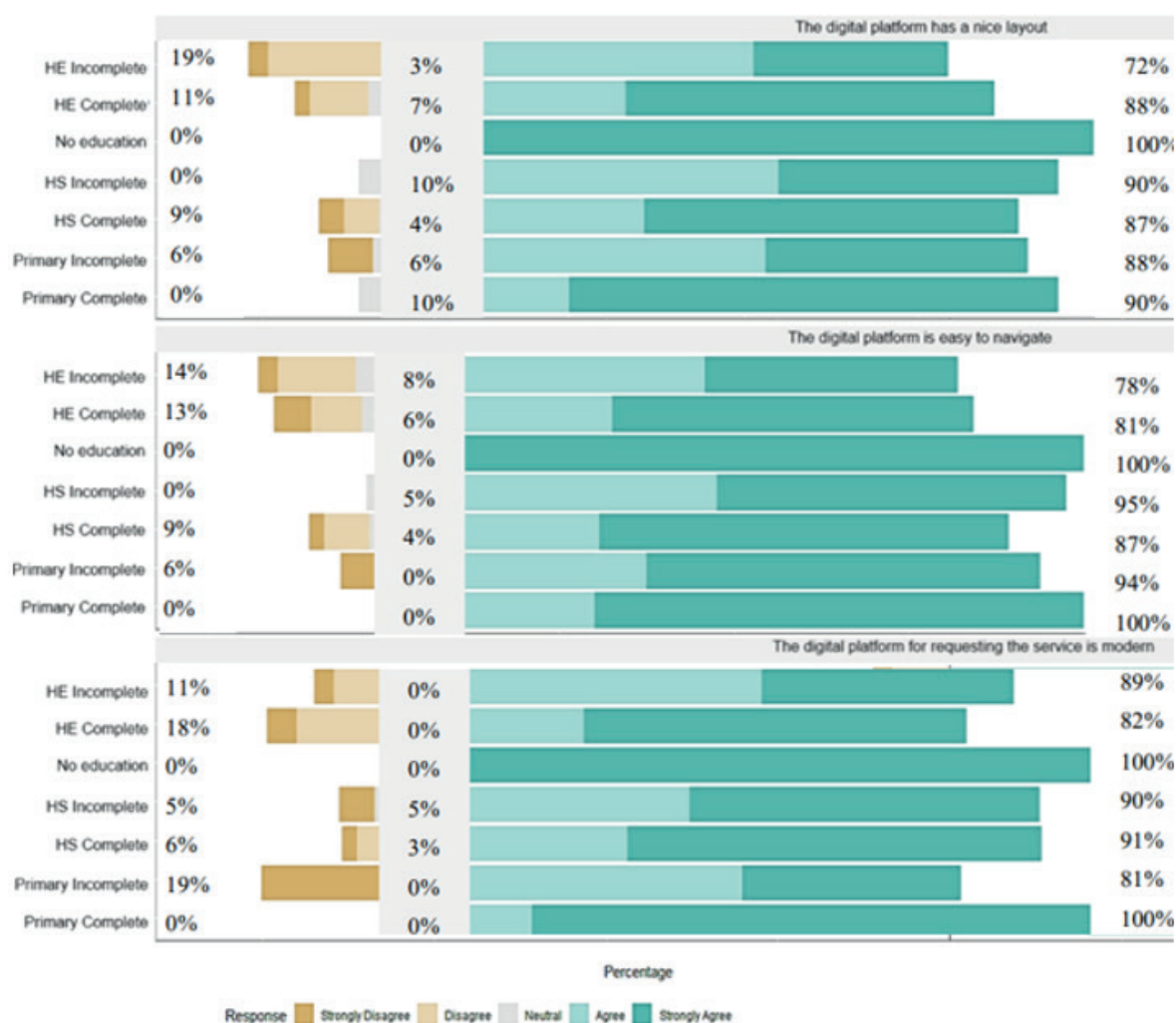
Figure 1. Education level of users of SRT services
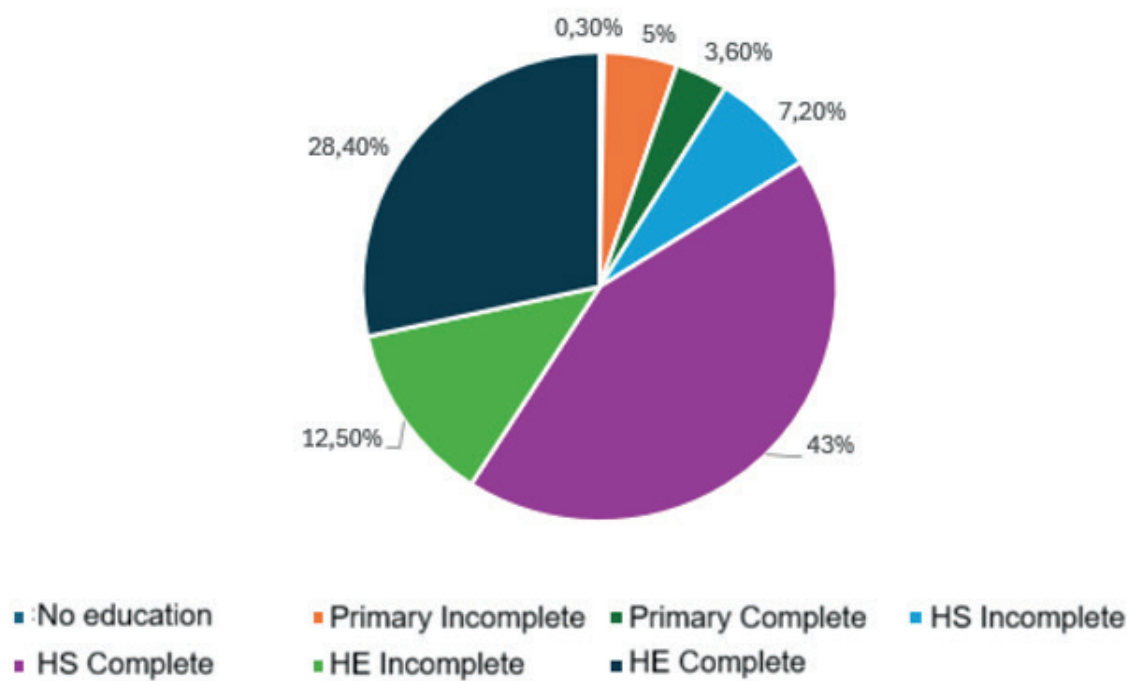
Source: The authors, field research

The quantitative analysis, based on the results of the SERVPERF questionnaire, indicates a positive perception regarding the quality of digital services offered by SRT, especially in tangibility and security (FIGURE 2).

Figure 2. Opinion of Digital CTPS Users

Source: The authors, field research

The tangibility dimension suggests that users consider SRT digital platforms modern and easy to use. However, there is variation across education levels; users with greater familiarity with technology demonstrate greater dissatisfaction with reliability and responsiveness, which points to the need for process adjustments to meet different expectations.

Regarding the type of service, the number of requests via ECF during the period studied was higher than the number of requests via the *Gov.br Portal* (FIGURE 3). Considering only the non-face-to-face means of user interaction, the number of users who use the CTPS Digital application and the Portal, compared with the requests via ECF, approximately 26.6% of the services require intervention or personalized guidance to the user.

Figure 3. Service Modality—Year 2022
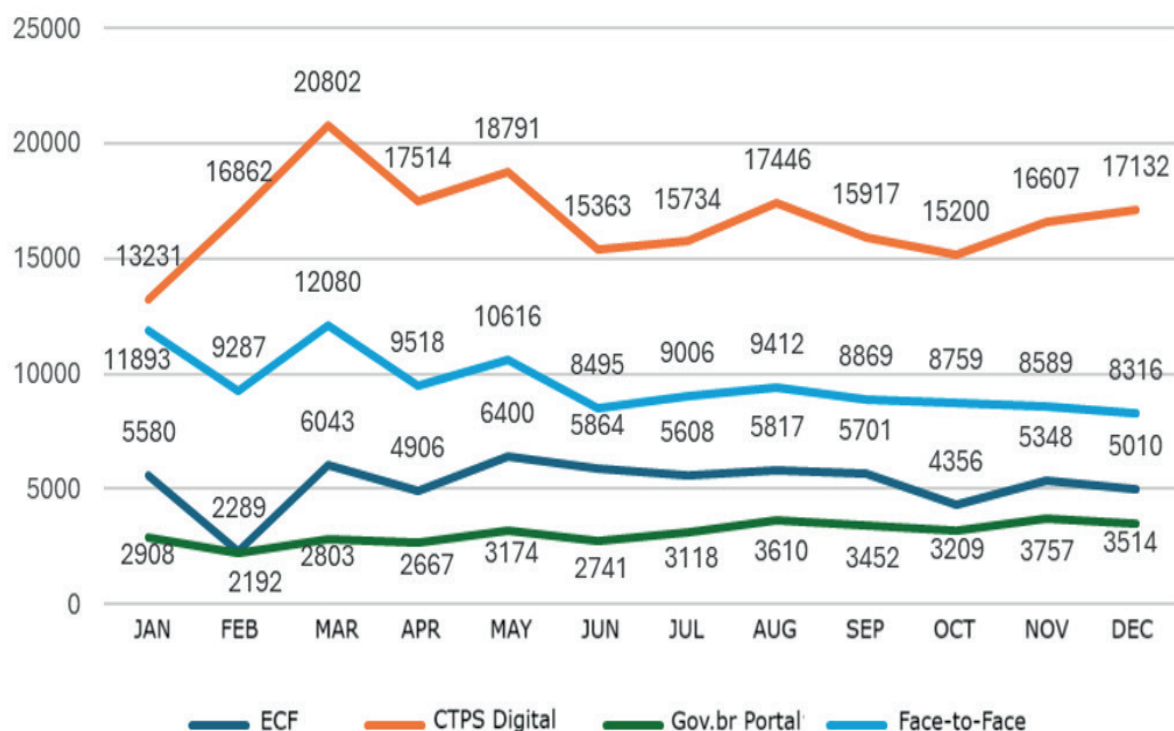
Source: The authors, field research

The results reveal that the modeling of the digital public service offered by SRT needs to be improved because it does not allow the entire digital journey of the user to occur within the platforms created for granting the benefit, requiring the intervention of attendants for the granting of the benefits to be effective. It is important to remember that delays in providing unemployment Insurance services can result in workers not receiving the benefit for weeks or even months, thus compromising financial vulnerability.

The security data, with a level of agreement of approximately 86%, indicates that users trust the system, mainly because of the use of single sign-on in Digital CTPS, which contributes to the perception of protection in accessing services. The analysis of the results confirms that incorporating ICTs through platforms such as Digital CTPS and ECF contributes to the efficiency of SRT services. However, continuous improvements in areas such as security and digital inclusion are essential to ensure a satisfactory and accessible user experience for all citizens, especially for those who face technological barriers.

Conclusions

This research investigated the incorporation of ICTs in SRT, focusing on CTPS Digital and ECF applications. The objective was to evaluate how digitalization contributes to strengthening the principle of efficiency in public management and to identify the challenges associated with digital inclusion, security, and modeling of digital services. The methodology included the application of questionnaires, interviews, and documentary analysis, allowing the triangulation of qualitative and quantitative data to capture the perceptions of users and employees.

The results indicate that the adoption of ICTs has brought improvements in reducing bureaucracy, response time, and accessibility, especially in services such as unemployment insurance and salary bonuses. Tangibility and security are the best-rated dimensions, highlighting the positive impact of automation on public services. However, responsiveness showed lower rates, suggesting that employee training is essential to meet demands quickly. In addition, limitations were identified in digital modeling, which still requires human assistance in specific steps, and gaps related to the inclusion of users who are less familiar with the use of technologies. The integration of channels and strengthening platform security require attention, particularly in ECFs.

The findings of this study indicate that the adoption of ICTs by SRT has contributed to increased efficiency and reduced waiting times in service delivery. However, persistent challenges related to digital literacy, security, and integration of service channels were identified. These results justify the need for future research to focus on the effectiveness of digital inclusion initiatives and training programs aimed at expanding the use of digital platforms among less digitally proficient users. Further investigation is also warranted on strategies to integrate digital and in-person service channels to overcome access barriers and ensure equitable service provision. These research directions are directly informed by the limitations and gaps identified in the present study.

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