Beyond the Interface: Usability and Value Creation in the Public Services Ecosystem

Rejane M. da C. Figueiredo[1], Andrea C. B. Judice[1], Marcelo O. Judice[1], Glauco V. Pedrosa[1], Flavio F. Costa[1], John L. C. Gardenghi[1], Stefani P. Ferreira[1], Bruna de O. Guedes[1,2]

[1]University of Brasilia (UnB)
Brasilia, DF – Brazil

[2]Ministry of Management and Innovation in Public Services (MGI)
Brasilia, DF – Brazil

{rejanecosta, andrea.judice, marcelo.judice}@unb.br

bruna.guedes@gestao.gov.br

Abstract. Introduction: *Digital transformation in the Brazilian public sector demands user-centered digital services that are accessible, efficient, and able to create public value.* ***Objective****: This report analyzes the usability of SplitGov system, a federal platform for contract and cost-sharing management, using the Public Service Ecosystem (PSE) model.* ***Methodology****: A triangulated evaluation combined heuristic analysis, guided navigation, and usability testing with public servants, aligned with UX principles and digital government strategies.* ***Results****: The study identified barriers related to accessibility, interface consistency, and task flow, proposing redesign recommendations to improve navigation, information retrieval, and user alignment.*
Keywords *user experience (UX), digital government, public service, digital transformation, human-computer interaction.*

1. Introduction

Digital transformation in the public sector represents a paradigm shift that goes beyond the mere digitization of administrative procedures. It entails a fundamental rethinking of citizen-state interactions, requiring digital services to be more accessible, responsive, and genuinely aligned with the needs of the population [Pedrosa et al. 2025]. In this scenario, user experience (UX) emerges as a strategic component for legitimizing and enhancing the effectiveness of digital public policies, contributing directly to increased institutional trust, broader digital inclusion, and improved service delivery [Norman 2013, Vial 2019, Mergel et al. 2019].

The growing emphasis on user experience introduces new challenges for Human-Computer Interaction (HCI), particularly in governmental settings marked by institutional complexity and sociotechnical diversity. The Grand Research Challenges in HCI 2025–2035 highlights the need to reconceptualize public technology through the lenses of inclusion, accessibility, and cultural diversity—advocating for human-centered solutions that are responsive to the country's diverse territorial, cultural, and administrative contexts [Pereira et al. 2024]. This understanding is also aligned with the Grand Challenges in Computing 2025–2035 [Sociedade Brasileira de Computação 2025], which

emphasizes the importance of interpersonal skills (soft skills), digital inclusion, service personalization, and citizen participation as key elements for advancing a human-centered digital transformation. As a result, the systematic evaluation of user experience becomes crucial to informing the development of systems that are more equitable, effective, and legitimate [Figueiredo et al. 2024a].

International research, particularly studies conducted by the OECD (Organisation for Economic Co-operation and Development), highlights that public services should be people-centered, with an emphasis on accessibility, simplicity, and responsiveness [OECD 2024, OECD 2023]. This perspective has gained substantial traction in Brazil, particularly through the institutionalization of the Federal Digital Government Strategy 2024–2027 (FDGS), established by Decree No. 12,198/2024 [Brasil 2024b].

In this context, the Public Service Ecosystem (PSE) model has emerged as both a theoretical and practical framework for understanding how user experience contributes to the creation of public value in digital services [Osborne et al. 2022]. The PSE advocates a systemic perspective that integrates subjective, organizational, institutional, and political dimensions, thereby guiding the design of public services that are more responsive, collaborative, and socially legitimized.

The PSE model proposes that public value emerges from the interaction among different actors, such as citizens, organizations, policies, and sociotechnical contexts. This interaction occurs across four interdependent levels: submicro, micro, meso, and macro. At the submicro level, the focus is on individual user experiences and their specific perceptions. At the micro level, interactions between actors directly influence the perception of value, affecting elements such as trust and satisfaction. At the meso level, professionals involved in service planning and operation, such as user experience analysts, developers, and public managers, connect user needs with institutional decisions. At the macro level, public policies, institutional norms, and regulations structure the conditions for offering digital services with equity and efficiency.

From this perspective, public value is not generated solely by the organizations providing the services. Rather, it emerges from situated and collaborative co-creation processes involving various stakeholders. In this context, applying well-defined user experience practices represents a strategic factor in promoting innovation in the public sector and generating value centered on citizens' needs.

This paper presents the results of a usability evaluation of the SplitGov system, developed by the Shared Services Secretariat of the Ministry of Management and Innovation in Public Services (MGI). SplitGov is a digital platform designed to manage contracts and shared expenses among federal agencies, with a focus on promoting transparency and enhancing administrative efficiency. The central question guiding this study is: *How can the user experience evaluation of the SplitGov system contribute to public value creation within the digital service ecosystem?* To address this question, we employed a triangulated methodological approach that integrates heuristic analysis, guided navigation, and user testing, all aligned with UX principles and the PSE model.

The main contributions of this study are threefold: (i) providing practical recommendations for redesigning the SplitGov interface based on empirical evidence; (ii) illustrating the applicability of the PSE model for analyzing user experience in digital

public systems; and (iii) advancing the HCI research agenda in the public sector by demonstrating how UX practices can enhance digital services and foster public value across subjective, organizational, and institutional levels.

This paper is structured as follows: Section 2 presents the theoretical framework, emphasizing literature on UX, digital transformation, and the PSE model. Section 3 describes the materials and methods used in the SplitGov usability evaluation. Section 4 details the results obtained and their implications. Section 5 discusses practical recommendations in light of the findings. Section 6 points out threats to the validity of the study. Section 7 explores broader contributions to the Public HCI Research Agenda, identifying key challenges for user-centered innovation in digital government. Finally, Section 8 presents the final considerations.

2. Theoretical Framework

2.1. Institutional Advances in Brazil

International organizations, such as the Organisation for Economic Co-operation and Development (OECD), emphasize that digital public services should be designed with a people-centered approach, considering criteria such as accessibility, equity, simplicity, and responsiveness [OECD 2024]. The report Global Trends in Government Innovation 2023 [OECD 2023] highlights emerging practices such as user segmentation (differentiating user profiles based on needs and behaviors) and co-design (co-creating solutions with active user participation) as central elements for generating public value.

This global movement towards more responsive and citizen-centered governments has found strong resonance in recent Brazilian public policies aimed at digital transformation. The Brazilian Federal Government has sought to encourage public agencies to transform their services into digital services for access, monitoring, and evaluation by citizens. Since 2016, important decrees have been published in this regard, such as the Digital Governance Policy (Decree No. 8,638 of January 15, 2016 [Brasil 2016a]), and the Digital Citizenship Platform (Decree No. 8,936 of December 19, 2016 [Brasil 2016b]), within the scope of federal public administration bodies and entities, including direct administration, autonomous agencies, and public foundations. In 2020, the creation of the Secretariat for Digital Government (SGD), and The Digital Government Strategy 2020–2022 (EGD) [Brasil 2020] and the more recent Federal Digital Government Strategy 2024–2027 (EFGD) [Brasil 2024b], demonstrate significant advances in institutionalizing user experience (UX) as a strategic dimension of federal public management.

The SGD has played a central role in this process, coordinating initiatives that incorporate UX principles and practices into the design and evaluation of digital public services. The EGD introduced “citizen centrality” as a structuring principle, promoting the use of satisfaction metrics, usability testing, and responsive interfaces within the Gov.br ecosystem. The EFGD [Brasil 2024b], in turn, elevates user experience to a strategic requirement, linking it to areas such as accessibility, plain language, universal design, and the personalization of federal public services.

In parallel, the National Digital Government Strategy 2024–2027 (ENGD) [Brasil 2024a] reaffirms these principles on a broader scale, guiding directives

for all levels of government-Federal, State, Federal District, and Municipalities-in the joint effort to digitally modernize the State. However, in the specific case of the direct federal public administration, autonomous agencies, and foundations, as in the SplitGov system, it is the EFGD that establishes the primary normative and operational parameters.

Table 1 synthesizes the main government documents that, over the last decade, have consolidated user experience as a structuring dimension of state modernization. These milestones reflect a paradigm shift: digital transformation is no longer understood merely as the digitization of processes, but as the construction of meaningful experiences for citizens. In this new scenario, UX practices—such as user testing, heuristic evaluation, and satisfaction measurement—become mandatory components in the lifecycle of digital services [Brasil 2018, Lima et al. 2022].

These guidelines not only legitimize the adoption of UX practices as part of the State's modernization but also represent a conceptual shift: digital transformation is now understood as effective only when it generates perceptible value for the citizen-both functionally and emotionally. This convergence between institutional guidelines and academic foundations of UX reinforces the importance of evaluations that consider the subjective, contextual, and social components of experience, especially in the context of digital public policies.

Each of these milestones represents a significant step in the evolution of digital governance in Brazil. Together, these strategies demonstrate a maturation of the governmental approach, moving from an instrumental view of technology to a value-creation conception centered on the citizen.

2.2. Recommended UX Practices

User experience (UX) has become a fundamental pillar for the digital transformation of governments worldwide. National research has highlighted the importance of usability in the effectiveness of digital public services. For example, the work of [Pereira et al. 2021] presents an evaluation of the usability of transparency portals of federal universities in Northeast Brazil, identifying that, although some portals partially meet quality and usability criteria, access to information still presents itself in an ordinary manner, indicating the need for improvement in the arrangement of online information.

The OECD, for instance, emphasizes the importance of practices such as user segmentation, universal design, and co-design to promote the generation of people-centered public value [OECD 2023]. In the Brazilian context, these guidelines have been progressively institutionalized through a series of normative and strategic frameworks that reinforce the centrality of citizens in the design and evaluation of digital public services.

Furthermore, reinforcing citizen centrality implies recognizing experience as situated, relational, and often unequal, requiring approaches that are sensitive to the diversity of social, cultural, and institutional contexts across the country [Figueiredo et al. 2024a]. This shift broadens the scope of Human-Computer Interaction (HCI) in the public sector, positioning it as an ally in institutional transformation. The acknowledgment of citizen diversity and the need for contextual adaptation is emphasized in initiatives such as the Public Sector Diversity Guide [Viana et al. 2024], reinforcing the importance of inclusive solutions that are responsive to socioterritorial differences in the

Tabela 1. Government Milestones of Citizen-Centered Digital Transformation

Year	**Strategy or Document**	**Contribution to the user experience in the public sector**	**Reference**
2016	Digital Governance Policy	Establishes initial guidelines for digitalization with a citizen focus, promoting governance and interoperability.	[Brasil 2016a]
2018	E-Digital – Brazilian Strategy for Digital Transformation	Reinforces digital inclusion and equity, focusing on access, connectivity, and population training.	[Brasil 2018]
2020–2022	Digital Government Strategy (EGD)	Introduces the principle of citizen centrality, institutionalizes UX metrics, and expands the gov.br ecosystem.	[Brasil 2020]
2024–2027	Federal Digital Government Strategy (EFGD)	Consolidates UX as a strategic requirement, emphasizing accessibility, plain language, and service personalization.	[Brasil 2024b]
2024–2027	National Digital Government Strategy (ENGD)	Expanding the digital transformation agenda across all three branches and levels of government, the strategy promotes integration, innovation, and the delivery of citizen-centered public services. It reinforces UX principles, such as accessibility, personalization, and citizen-centered design, while fostering collaboration across government levels to ensure seamless and inclusive digital experiences.	[Brasil 2024a]

design of digital services. It also supports the redesign of public services through a Service Design approach, placing the user at the center of development [Figueiredo et al. 2024b].

2.3. The Public Service Ecosystem (PSE) Model

To understand the effects of user experience on public value creation, it is necessary to adopt models that articulate multiple levels of analysis. The Public Service Ecosystem (PSE) model, proposed by [Osborne et al. 2022], offers a robust conceptual framework for this purpose. It organizes value creation into four interconnected levels:

1. **Submicro**: individual users' beliefs, values, motivations, and capabilities;
2. **Micro**: direct experience of use and interaction with the service;
3. **Meso**: organizational practices, institutional competencies, and operational routines;
4. **Macro**: the political, normative, and cultural environment that shapes public services.

The PSE shifts the traditional view of services as mere "delivery" toward a relational perspective, in which value is co-produced by multiple actors, citizens, public servants, managers, designers, and sociotechnical systems. This approach expands the role of design and HCI, requiring alignment between operational and strategic levels of the ecosystem. Digital solutions should not be conceived as isolated artifacts or one-off technical responses, but rather as interdependent components of a broader system, sustained by institutional relationships, organizational capabilities, and public policies.

Consequently, design must consider the structural and operational constraints that shape the implementation and use of services over time. The PSE emphasizes an understanding of services as platforms for value creation. Public services are interactive spaces in which different forms of value (functional, symbolic, and relational) are co-created through interactions among diverse actors. The effectiveness of a service, therefore, lies not only in its operational efficiency but also in its capacity to address users' contextual needs, strengthen trust relationships, and produce shared meanings.

Another central implication is the recognition of co-design and co-production as structuring practices in public innovation processes. Active listening, citizen participation, and multi-stakeholder collaboration, among civil servants, designers, managers, and end users, should be understood not as peripheral, but as fundamental elements for the development of legitimate, relevant, and sustainable solutions.

Moreover, the model advocates for a multi-level impact assessment. The effectiveness of a service should be evaluated not only by technical-operational performance indicators, but also by its influence on institutional structures, organizational routines, user experiences, and subjective perceptions of value, trust, and legitimacy.

In the Brazilian context, the adoption of the Federal Digital Government Strategy (EFGD 2024–2027) [Brasil 2024b] and the prioritization of UX as a strategic pillar illustrate the macro level's orientation toward citizen-centered value creation. Practices such as usability testing, heuristic analysis, and satisfaction metrics reflect meso-level institutional capabilities. The SplitGov system, evaluated in this study, provides a concrete case at the micro level, enabling analysis of how citizens interact with a public digital solution and which experience dimensions contribute (or not) to perceived value.

Ultimately, the PSE model guides a shift in posture in the development of digital public services. It demands institutional openness, cross-sector collaboration, and a focus on long-term trust relationships with citizens. Within this framework, public value emerges from social interactions and institutional responsiveness. Less emphasis is placed on isolated technical performance, and greater importance is given to the relational legitimacy of the service—expressed in the quality of interactions, shared meanings, and the State's capacity to act with empathy, justice, equity, and purpose.

By applying the PSE to the Brazilian context, it becomes possible to analyze how norms, institutional capacities, and everyday interactions shape the effectiveness of digital services. The model also reinforces the importance of practices such as co-design, active listening, and participatory evaluation, which contribute to more inclusive and socially legitimate services. Thus, the PSE aligns with contemporary challenges of digital transformation while offering concrete pathways to strengthen public value.

3. Materials and Methods

3.1. Evaluation Context and System Characterization

The usability evaluation of the SplitGov system was conducted in April 2025 as part of a partnership between the University of Brasilia and the Shared Services Secretariat (SSC) of the Ministry of Management and Innovation in Public Services (MGI). The study focused on identifying usability barriers and proposing improvements to the user experience, based on UX practices and the Public Service Ecosystem (PSE) model framework.

SplitGov is a digital platform designed for managing shared contracts and expenses among federal public administration agencies. The tool integrates information on public properties, administrative contracts, and cost-sharing reports, automating the distribution of expenses based on physical space occupancy and current contractual rules. The system serves civil servants working in planning, budgeting, engineering, and contract management across 13 ministries participating in the ColaboraGov program, as well as other public agencies.

The solution is structured into three main modules:

- **Properties:** responsible for the registration and management of federal properties;
- **Contracts:** allows for the registration and monitoring of shared contracts between agencies;
- **Reports:** provides data extraction functionalities to support decision-making and accountability.

System access is provided through the unified Gov.br login, with authorization granted via institutional registration. The diversity of user profiles and the complexity of tasks justify the use of user-centered methods for evaluating the platform.

3.2. Methodological Strategy

The usability evaluation of the SplitGov system was conducted using a methodological triangulation approach, as illustrated in Figure 1. Each of these techniques contributes distinct perspectives on the user experience, enabling a more robust and comprehensive analysis:

1. **Guided navigation with experienced users:** sessions were conducted with two SSC staff members with different user profiles (view-only and editing). The sessions took place in real usage contexts and were monitored by UX analysts who recorded user interactions, obstacles encountered, and spontaneous strategies adopted. The technique was adapted to incorporate principles of contextual inquiry, with an emphasis on active listening and participants' perceptions [Norman 2013].
2. **Usability testing with direct observation and *think aloud*:** five public servants participated, selected for convenience. During the sessions, users performed typical tasks in the system while verbalizing their actions, questions, and perceptions [Nielsen 1994]. Other civil servants observed the sessions, enabling opinion triangulation and collaborative observations.
3. **Expert heuristic evaluation:** three evaluators with experience in Human-Computer Interaction applied Nielsen's ten usability heuristics, adapted to the context of government systems [Nielsen 1994]. The heuristics were applied across all platform functionalities, supported by functional documentation provided by SSC.

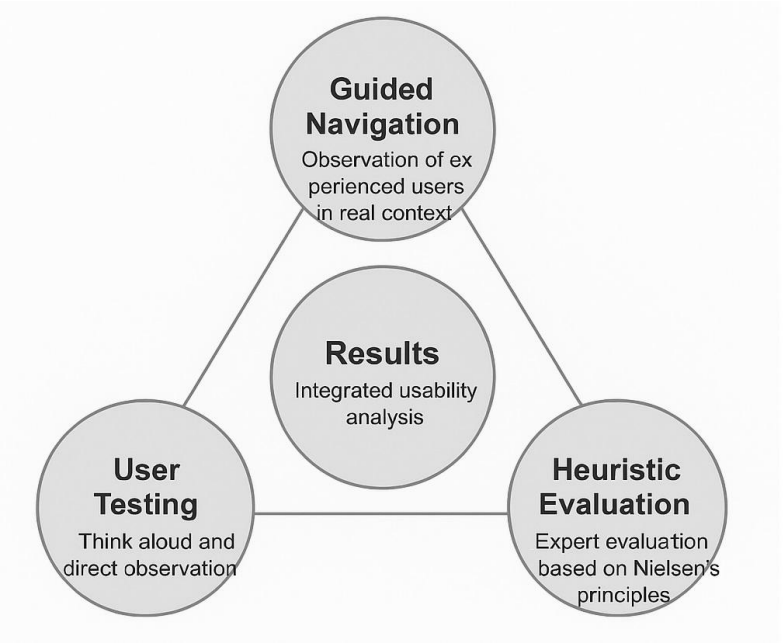

Figura 1. Methodological triangulation for the evaluation of SplitGov.

This methodological combination aimed to capture different dimensions of the user experience: the users' subjective perspective, functional performance in real tasks, and design inconsistencies identified by experts.

3.3. Integration of Results

Data from the three methods were integrated through a cross-analysis, which allowed for the identification of recurring patterns, critical usability issues, and opportunities for improvement in the system's interface and functional logic. This approach is consistent with the PSE model, as it simultaneously considers the users' perspective, the organizational structure, and the institutional constraints that influence service delivery.

The triangulation of methods enhanced the robustness of the evaluation and provided empirical support for redesign proposals aimed at public value creation, as will be detailed in the next section.

3.4. Ethical Considerations

The study was conducted in accordance with ethical principles aligned with best practices for research involving human participants. All participants were previously informed about the evaluation objectives, the methodology used, and how the collected data would be utilized. Participation was voluntary, based on free and informed consent, and the names of participants and specific institutions were anonymized to ensure confidentiality. It was also made clear that participants could withdraw from the study at any time without any consequences.

Mitigation measures were prepared to offer support in case any discomfort arose, such as fatigue or frustration during the sessions. Guided navigation sessions and usability tests were conducted in a safe environment during regular working hours, respecting the routines and institutional context of the civil servants involved. No sensitive or personally identifiable data were stored, and all observations were recorded in an aggregated and non-identifiable manner.

As this was an applied research project carried out in an institutional setting aimed at the continuous improvement of public services—and not involving the collection of personal data or clinical experimentation, it was conducted in compliance with ethical standards for non-biomedical research. Nonetheless, the principles of Resolution No. 510/2016 of the Brazilian National Health Council were observed, particularly regarding respect for participants' dignity, autonomy, and well-being, focusing exclusively on understanding user opinions about digital interfaces, products, and services.

4. Results and Discussion

The integrated data analysis enabled the identification of a set of usability barriers that directly impact the clarity, autonomy, and efficiency of interactions with the SplitGov system. These findings reflect both design flaws and gaps in operational workflows, which affect the quality of the experience for public servants.

Moreover, the results point to concrete opportunities for improving the system's interface and functionalities, aligned with citizen-centered digital transformation guidelines. The methodological diversity adopted made it possible to understand the user experience from technical, functional, and subjective perspectives, strengthening the validity of the findings.

4.1. Main Usability Issues Identified

The evaluation led to the identification of five main categories of usability issues:

- **Status visibility and lack of feedback:** insufficient visual feedback after actions such as deleting or editing contracts, causing uncertainty among users.
- **Interface overload:** presence of irrelevant buttons and tabs for certain user profiles, hindering navigation and increasing task completion time.

- **Lack of filters and search functionality:** absence of adequate search fields and filters in the contracts and reports modules, requiring manual effort to locate information.
- **Difficulty in reading reports:** complex and poorly explained report structures that compromise their usefulness for decision-making.
- **Vague error messages:** lack of clear instructions for error resolution, making it difficult for users to correct their actions.

4.2. Connection with the Applied Methods

The methodological triangulation enabled consistent identification of these issues:

- **Guided navigation** allowed the observation of concrete obstacles during task execution and mismatches between users' mental models and the interface logic.
- **Think-aloud usability testing** revealed frustrations related to interface overload and the absence of filters, while also highlighting the role of ambiguous language in the reports.
- **Heuristic evaluation** confirmed violations of Nielsen's heuristics, particularly in the categories of system status visibility, error prevention, consistency and standards, and help and documentation. These findings are summarized in Table 2.

4.3. Contributions in Light of the PSE Model

The analysis of the collected data enabled the interpretation of the usability evaluation findings through the lens of the Public Service Ecosystem (PSE) model, which structures public value creation across four interdependent levels: submicro, micro, meso, and macro. Below, we describe how each of these levels manifests in the context of the SplitGov system.

- **Submicro level (individual user experience):** during tests and interviews, it was observed that users with different profiles expressed feelings of frustration, uncertainty, and hesitation when facing poorly indicated or ambiguous functionalities. The lack of clear visual feedback after critical actions (such as saving or deleting contracts) undermined users' sense of control and security. These aspects demonstrate how individual values (such as trust, autonomy, and clarity) are directly impacted by interface design decisions.
- **Micro level (interaction with the service):** usability issues compromised the fluidity of direct interaction with the system. The absence of filters and search mechanisms made basic tasks more difficult, increasing the time required to find information. Visual overload, with redundant or irrelevant buttons for the user profile, also caused confusion and negatively affected interaction efficiency. This level highlights the role of HCI in mediating between the user and the service.
- **Meso level (organizational and operational context):** limitations were identified in the alignment between system functionalities and the administrative processes of user units. In some cases, access profiles allowed actions that did not correspond to the user's institutional responsibilities, revealing a flaw in organizational design. The absence of formal support routines or direct feedback channels for recurring issues was also noted, indicating institutional weaknesses in maintaining the quality of the digital service.

- **Macro level (political and regulatory environment):** the usability evaluation itself, with the active participation of the SSC technical team and the university's support, represents a practice aligned with the guidelines of the Federal Digital Government Strategy 2024–2027. This initiative contributes to consolidating a culture of listening, continuous improvement, and user-centered evaluation within public administration. The use of HCI methods in the context of digital public policy reinforces the value of inter-institutional collaboration in improving the quality of government services.

Interpreting the findings through the PSE model helps to understand that usability issues are not limited to the interface but reveal complex relationships between individuals, systems, organizations, and policies. Therefore, improving SplitGov requires interventions at multiple levels of the service ecosystem to ensure that public value is effectively perceived by users.

Table 3 summarizes the main findings organized according to the four levels of the PSE model, facilitating the visualization of the evaluation's contributions across different layers of the digital service ecosystem.

5. Practical Recommendations

Based on the identified usability issues, a set of recommendations was developed to improve the user experience of the SplitGov system. The suggestions were organized into three main areas: (i) interface and navigation, (ii) user profiles and functionalities, and (iii) support and documentation. These recommendations not only address specific shortcomings but also reinforce the importance of UX practices as a strategic pillar for generating public value in digital services.

Table 4 summarizes the proposed actions, grouped according to the nature of the identified issues and the required level of intervention.

Implementing these recommendations can contribute not only to increased user satisfaction and productivity but also to strengthening collaborative governance and promoting adherence to digital platforms in the public sector. The adoption of iterative evaluation and improvement cycles, with active user participation, is essential to consolidate a citizen-centered design culture.

5.1. Redesign Based on UX Principles

The recommendations presented in the previous section can be further developed based on specific User Experience (UX) principles and the findings from the evaluation. For each action area, we propose detailed guidelines to support the redesign of the SplitGov system.

5.1.1. Interface and Navigation: Implementation of Responsive Design

In addition to visual clarity and standardization across modules, it is recommended to implement responsive design to accommodate the various access conditions of public servants. During the tests, it was observed that some users accessed the system from

Tabela 2. Usability Issues Identified in SplitGov According to Nielsen's Heuristics

Problem Category	Observed Example	Violated Heuristic
Status Visibility	Lack of visual feedback when removing contracts	Visibility of system status
Error Prevention	Free text fields accepting inconsistent terms	Error prevention
Consistency and Standards	Differences in layout and font across modules	Consistency and standards
Help and Documentation	Absence of contextual help or direct support channel	Help and documentation

Tabela 3. Contributions by levels of the PSE model.

PSE Level	Conceptual focus	Evaluation evidence	Contribution to value creation
Submicro	Values, beliefs, and dispositions of the actors involved	Technical team's openness to active listening and review of design decisions	Promotion of empathetic and reflective attitudes, fundamental for user-centered design
Micro	Individual user experience with the public service	Navigation difficulties, lack of feedback, unclear messages, ambiguity of permissions	Improvement of user experience and trust in the system, with potential to increase autonomy and reduce errors
Meso	Organizational processes and relationships between institutional actors	Cooperation among developers, managers, UX analysts, and experienced users	Strengthening of co-production and institutional learning, impacting the prioritization of improvements and organizational culture
Macro	Institutional structure and public policies that shape the services	Alignment with the Federal Digital Government Strategy (2024–2027) and international guidelines on UX in the public sector	Integration of the evaluation into the national effort for citizen-centered digital transformation

Tabela 4. Recommendations for Improving SplitGov Usability

Action Area	Detailed Recommendations
Interface and Navigation	- Redesign the interface with a focus on visual clarity and standardization across modules. - Implement immediate visual feedback after critical actions (e.g., save, delete, submit). - Add filters, text search, and sorting options to the contract, property, and report lists. - Restructure reports with visual elements (tables, icons, charts) and accessible language.
User Profiles and Functionalities	- Review access profiles to hide actions not relevant to certain users. - Implement adaptive conditional logic for menus and fields based on the user profile. - Prioritize improvements in the most commonly used workflows (such as contract registration and report generation).
Support and Documentation	- Include contextual help (tooltips, info icons) directly on the screens. - Provide a user manual with step-by-step instructions and illustrations. - Create a direct and visible technical support channel for resolving questions and collecting feedback.

different devices and with significant variations in screen resolution, which compromised the visibility of important interface elements.

The redesign should consider:

- **Clear visual hierarchy:** Establish a visual hierarchy that highlights primary and secondary actions, using contrast, size, and positioning to guide the user's eye. During the tests, users frequently spent time searching for essential functions that were visually underrepresented in the interface.
- **Adaptive design:** Ensure that the interface properly adapts to different screen sizes and devices, maintaining usability and readability under all access conditions.
- **Consistency across modules:** Standardize interaction elements (buttons, fields, menus) throughout the system modules, using the same visual and interactive vocabulary to reduce the learning curve. The heuristic analysis identified significant inconsistencies, such as buttons with the same function appearing differently across modules.
- **Immediate feedback:** Implement clear visual indicators after critical actions, such as:
  - Visible confirmations after saving information;
  - Completion messages following successful operations;
  - Progress indicators for longer operations;
  - Visual alerts for irreversible actions.

5.1.2. Enhancement of Search and Filtering

The absence of efficient search and filtering mechanisms was one of the most critical barriers identified during user testing. It is recommended to implement a robust search system with the following features:

- **Unified search:** A global search field allowing users to find information across all system modules, with contextual suggestions and autocomplete functionality.
- **Advanced filters:** Filtering options tailored to the specific needs of different user profiles, such as:
  - Filters by time period (contract start and end dates);
  - Filters by status (ongoing, completed, pending);
  - Filters by agency or administrative unit;
  - Filters by value or budget category.
- **Personalized views:** Allow users to save frequently used search and display configurations, reducing time spent on repetitive operations.

During the test sessions, it was observed that experienced users developed their own strategies to overcome the lack of filters, such as exporting data to external spreadsheets and then performing searches. This practice, although functional, is inefficient, compromises data integrity, and increases the risk of errors.

5.2. Multilevel Approach to Experience Improvement

Aligned with the Public Service Ecosystem (PSE) model, a multilevel approach is proposed for implementing the identified improvements, considering interventions across different layers of the ecosystem:

5.2.1. Interventions at the Submicro Level (Individual Experience)

- **Contextual personalization:** Implement interface customization options based on users' specific preferences and needs, such as contrast adjustments, font size, and element layout.
- **Personalized onboarding:** Develop interactive tutorials tailored to the user's profile, guiding them through the most relevant features for their specific roles and responsibilities.
- **Emotional feedback:** Include design elements that generate positive emotional responses, such as messages of recognition for completed tasks or achieved milestones.

5.2.2. Interventions at the Micro Level (Interaction with the Service)

- **Simplification of critical workflows:** Redesign the most frequently used workflows, such as contract registration and report generation, by reducing the number of required steps and eliminating redundant information.
- **Proactive error prevention:** Implement real-time form validation, highlighting potential issues before users attempt to submit information.

- **Cross-channel consistency:** Ensure that the user experience is coherent across all access channels to the system, including the web version, potential mobile applications, and integrations with other government systems.

5.2.3. Interventions at the Meso Level (Organizational Context)

- **Community of practice:** Create a collaborative space for users from different agencies to share best practices, solutions to common issues, and suggestions for system improvement.
- **Review of competencies and profiles:** Align system permissions and functionalities with the actual responsibilities of civil servants, avoiding overload from irrelevant options or lack of access to essential features.
- **Structured feedback cycles:** Institutionalize regular processes for collecting user feedback, including satisfaction surveys, contextual interviews, and co-creation sessions to support the system's continuous evolution.

5.2.4. Interventions at the Macro Level (Political and Regulatory Environment)

- **Public value metrics:** Develop indicators to measure the impact of usability improvements on public value generation, such as reduced time for administrative processes, increased transparency of shared expenses, and greater agency participation in the program.
- **Collaborative governance:** Establish a multidisciplinary governance committee for the system, including UX specialists, public managers, and end-user representatives.
- **Alignment with national guidelines:** Ensure that system developments comply with the standards set by the Federal Digital Government Strategy and the federal government's digital accessibility guidelines.

6. Threats to Validity

Despite the adoption of a robust methodological strategy, some threats to validity must be acknowledged, both in relation to the generalization of the findings and the interpretation of the data. The main limitations are presented below:

- **External validity:** the tests were conducted with users from a single agency (SSC/MGI), which may limit the representativeness of the findings in relation to other user profiles within the federal government. The results should not be automatically generalized to all agencies or digital public systems.
- **Data fidelity:** the sessions were not fully recorded due to institutional privacy concerns, which prevented exact review of verbal and non-verbal interactions. Notes and records were taken manually and interpretively.
- **System evolution:** SplitGov is under continuous development, which means that some functionalities may have been updated after the evaluation. This may affect the current relevance of specific findings or recommendations.

It is important to note that the short timeframe available for testing imposed some methodological constraints. The limited number of sessions focused on two user profiles

available during the evaluation period, which may not represent the full range of system usage experiences. Participant selection was conditioned by scheduling availability, which limited the diversity of tested profiles and contexts. Nevertheless, the insights gathered provided valuable contributions for improving the solution.

These limitations do not invalidate the results obtained but indicate the need for future replications of the evaluation with different user profiles, as well as the institutionalization of iterative testing cycles to accompany the platform's evolution. Complementary studies with a quantitative or longitudinal focus could also enrich the understanding of the impacts of the proposed improvements.

7. Contributions to the Public HCI Research Agenda

Based on the empirical findings and the interactions with various institutional actors during the evaluation of the SplitGov system, challenges emerged that go beyond the scope of the analyzed platform and resonate with the contemporary research agenda in Computing applied to the public sector. In this section, we reflect on three of these challenges, emphasizing their relevance to the field of Human-Computer Interaction (HCI) and Com- puting [Pereira et al. 2024, Sociedade Brasileira de Computacao 2025] in the context of the public sector:

7.1. Personalization and adaptation in rigid normative contexts

One of the main challenges lies in designing interfaces that dynamically adapt to different user profiles while simultaneously complying with legal and administrative constraints. Systems like SplitGov require differentiated levels of access and functionality, demanding adaptive design solutions grounded in profile modeling and complex business logic.

Advancements in this area may involve the development of models that integrate legal requirements with usability heuristics, enabling personalized experiences without compromising regulatory compliance—an essential yet sensitive issue for digital transformation in the public sector.

7.2. Supporting participatory processes in iterative development cycles

Institutionalizing continuous evaluation and improvement cycles calls not only for appropriate tools, but also for profound cultural and organizational shifts. HCI must contribute with methods and infrastructures that enable the participation of non-technical users throughout the system lifecycle, fostering co-creation and collaborative testing in real time.

The SplitGov experience highlighted the value of participatory approaches such as contextual design and direct observation testing, but also revealed the institutional challenges to scaling such practices. Public computing must therefore evolve toward agile, context-aware methodologies that incorporate continuous evaluation without compromising system stability or security.

7.3. Scalability of UX solutions in complex sociotechnical ecosystems

Even when good UX practices are identified, replicating them across different government contexts presents significant obstacles. Legacy systems, diverse institutional actors, and varying degrees of digital maturity hinder the broad dissemination of solutions.

This underscores the need for scalable and adaptable UX models that are sensitive to the institutional diversity of the public sector. Such models must be capable of operating across different stages of digital transformation, promoting standardization without disregarding local specificities, an important frontier for applied HCI and service design research in the public domain. Addressing this challenge is vital to ensure the scalability of user-centered innovations and to foster more inclusive and effective public digital services.

8. Conclusion

This study aimed to evaluate the user experience of the SplitGov system through the lens of the Public Service Ecosystem (PSE) model, seeking to understand how the platform's usability can contribute to the creation of public value in digital government services. The guiding question — *How can the user experience evaluation of the SplitGov system contribute to public value creation within the digital service ecosystem?* — was investigated through a methodological triangulation strategy combining heuristic analysis, guided navigation, and user testing.

For design and HCI professionals working in the public sector, this study offers a practical example of how to conduct usability evaluations in government systems and translate their results into actionable recommendations. The integration of the PSE model into UX practice represents an innovative approach that can be replicated in other public administration contexts, contributing to more people-centered digital services aligned with institutional needs.

The results revealed significant flaws in the interface, navigation flows, and system-user communication, compromising the clarity, efficiency, and reliability of interactions. The integrated analysis of the findings led to practical recommendations for system redesign, focusing on usability improvements, alignment of functionalities with user profiles, and enhanced contextual support.

The main contributions of this study include: (i) the empirical identification of usability barriers in a complex public system; (ii) the demonstration of the applicability of the PSE model as an analytical lens for evaluating digital services; and (iii) the proposal of structured recommendations that align UX principles with the institutional guidelines of the 2024–2027 Federal Digital Government Strategy.

Beyond its applied contributions, the study also opens avenues for future research. In particular, the reflections presented in Section 7 highlight emerging challenges for Public HCI, such as designing adaptive systems in regulatory contexts, institutionalizing participatory methods, and scaling UX practices across complex sociotechnical environments. These challenges underscore the need for new approaches, frameworks, and infrastructures that enable human-centered innovation in the public domain

This study also contributes to the field of Human-Computer Interaction (HCI) applied to the public sector by showing how systematic user experience evaluation can support concrete improvements in complex government systems. The analysis of SplitGov through the PSE model revealed that usability is not merely an interface issue, but a structural element in the creation of public value across multiple levels of the digital service ecosystem.

For future work, we recommend: (a) iterative implementation of the proposed improvements with a new round of testing involving diverse users; (b) adoption of continuous experience and performance indicators for platform monitoring; and (c) integration of UX metrics into results-based management models, such as institutional OKRs.

In addition to reinforcing the relevance of HCI in the State's digital transformation, the study also highlights the importance of active listening, empathy, and the participation of multiple actors in the continuous improvement of public services. By adopting a human-centered approach, the federal government can not only improve the operational efficiency of its systems but also strengthen bonds of trust, inclusion, and legitimacy with citizens.

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Ethical Considerations

This study was conducted in collaboration with a public agency that requested the research, with the aim of evaluating the usability of the SplitGov system, which is under development by the agency itself. The study involved two members of the partner Secretariat team and five public servants, who voluntarily participated in the evaluation activities, including guided navigation sessions, usability tests with think-aloud protocols, and expert heuristic evaluations.

The activities were carried out with methodological rigor and ethical oversight, ensuring respect for privacy, transparency, equity, and confidentiality. The triangulation of methods and the presence of expert observers allowed for reliable recording of users' interactions and perceptions without compromising their integrity or well-being. All participants were fully informed about the objectives, procedures, and nature of the study, and agreed to participate voluntarily, without any form of coercion or financial incentive.

The results were used exclusively to improve the system, with no disclosure that could identify the participants. Although the research was not submitted to a Research Ethics Committee (CEP), adherence to the ethical principles of the Brazilian Computing Society and collaboration with a public agency committed to institutional best practices ensured that the study was conducted with responsibility, integrity, and respect for both the participants and the research object

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