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Usability Analysis of the Banyuwangi *Smart Kampung* Website with the Nielsen Heuristic Model to Improve User Experience and the Efficacy of Digital Services

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Abstract
The implementation of digital services through the *Smart Kampung* website represents a pivotal strategic innovation by the Banyuwangi Regency Government to decentralize and enhance public service delivery. However, the efficacy of these digital interventions is fundamentally contingent upon the website's usability, which directly dictates the quality of user experience (UX) and the overall success of e-government adoption. This research performs an exhaustive usability analysis of the *Smart Kampung* platform using the ten heuristic principles established by Jakob Nielsen. Employing a descriptive quantitative methodology, the study surveyed 73 active users within the Banyuwangi community using a 20-indicator instrument. The results demonstrate that while the platform excels in aesthetic minimalist design (92% satisfaction) and maintains a strong alignment with real-world conventions (78%), it exhibits significant deficiencies in flexibility and efficiency of use (50% disagreement) and user control and freedom (46% disagreement). These findings suggest a rigid architectural framework that may alienate advanced users and lack intuitive recovery mechanisms. The study recommends the integration of "emergency exits" for erroneous actions and the development of specialized features for expert users to foster a more inclusive and effective digital governance ecosystem.

Keywords: *Usability Analysis, Nielsen's Heuristic, Smart Kampung, User Experience, E-Government*

Abstrak
Pelaksanaan layanan digital melalui situs web Smart Kampung merupakan inovasi strategis yang krusial oleh Pemerintah Kabupaten Banyuwangi untuk mendesentralisasikan dan meningkatkan penyampaian layanan publik. Namun, efektivitas intervensi digital ini secara fundamental bergantung pada kemudahan penggunaan situs web, yang secara langsung menentukan kualitas pengalaman pengguna (UX) dan kesuksesan adopsi e-government secara keseluruhan. Penelitian ini melakukan analisis kemudahan penggunaan yang komprehensif terhadap platform Smart Kampung menggunakan sepuluh prinsip heuristik yang ditetapkan oleh Jakob Nielsen. Dengan metode kuantitatif deskriptif, studi ini mensurvei 73 pengguna aktif di komunitas Banyuwangi menggunakan instrumen dengan 20 indikator. Hasil menunjukkan bahwa meskipun platform ini unggul dalam desain minimalis estetis (92% kepuasan) dan sejalan dengan konvensi dunia nyata (78%), platform ini memiliki kekurangan signifikan dalam fleksibilitas dan efisiensi penggunaan (50% ketidaksetujuan) serta kontrol dan kebebasan pengguna (46% ketidaksetujuan). Temuan ini menyarankan adanya kerangka arsitektur yang kaku yang dapat menjauhkan pengguna tingkat lanjut dan kurangnya mekanisme pemulihan yang intuitif. Studi ini merekomendasikan integrasi "pintu keluar darurat" untuk tindakan yang salah dan pengembangan fitur khusus untuk pengguna ahli guna mendorong ekosistem tata kelola digital yang lebih inklusif dan efektif.

Kata Kunci: *Analisis Usability, Heuristik Nielsen, Smart Kampung, Pengalaman Pengguna, Pemerintahan Elektronik*

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Introduction

The global landscape of public administration is undergoing a fundamental shift, driven by the rapid and unavoidable proliferation of information and communication technology (ICT). This evolution has facilitated an unprecedented acceleration in information exchange, communication accessibility, and operational digitalization, compelling governments at both central and local levels to modernize their service delivery mechanisms. Within the Indonesian context, the Banyuwangi Regency has distinguished itself as a frontrunner in this digital transition through the "*Smart Kampung*" (Smart Village) initiative, officially commenced in October 2010.

Banyuwangi, the largest regency in East Java, encompasses approximately 5,782.50 square kilometers, divided into 25 sub-districts and 189 villages (Gartika et al., 2019). The geographical vastness poses a significant challenge; some villages are situated over 100 kilometers from the central district hub, requiring a three-hour drive for residents to access basic government services. The *Smart Kampung* program was conceived to bridge this physical divide by bringing government functions closer to the community level through a fiber-optic-based e-governance system (Perguna et al., 2021). This program aligns with the national "Movement Towards 100 Smart Cities" and President Jokowi's vision of developing Indonesia from the periphery (Perguna et al., 2021).

The concept of usability is central to the success of such digital platforms. As defined in the literature, usability describes the degree of effectiveness, efficiency, and satisfaction with which a user can interact with a human-made tool to achieve specific objectives. In the realm of human-computer interaction (HCI), usability refers to the clarity and ease with which a computer program or website interface can be navigated. Despite the technical robustness of the *Smart Kampung* infrastructure which has linked 189 village offices and 60 health centers preliminary observations indicate persistent obstacles regarding accessibility and intuitive navigation.

The "*Smart Kampung*" initiative is not merely a technological project but a comprehensive community development model. By 2019, the regency had established 175 fiber-optic villages, enabling applications that range from population administration to health services and poverty alleviation. However, the success of e-government is often hindered by technological determinism, where the digital tool is treated as the goal rather than a means to empower the community (Perguna et al., 2021). To ensure that the platform serves its intended purpose effectively, a systematic evaluation using a validated framework is required.

The heuristic evaluation model proposed by Jakob Nielsen is uniquely suited for identifying design deficiencies and usability hurdles in digital interfaces (Khairat et al., 2022). This method utilizes a "rule of thumb" approach to analyze interface support systems and pinpoint specific violations that degrade user experience (Markswebb, 2024). Nielsen's framework consists of ten primary principles: visibility of system status, match between system and the real world, user control and freedom, consistency and standards, error prevention, recognition rather than recall, flexibility and efficiency of use, aesthetic and minimalist design, help users recognize and recover from errors, and help and documentation (UX247, 2024).

Previous studies has demonstrated the utility of this model across various Indonesian digital public services. For instance, Afifah et al. (2024) found a satisfaction rate of only 54% for the Siliwangi University Informatics website, necessitating a layout reorganization. Similarly, Ramadhan et al. (2024) identified a strong correlation between usability dimensions and user satisfaction at Medan Area University. In the governmental sector, research on the "*e-Pangan*" application and Pagar Alam City Government apps revealed that while functional, many platforms still present challenges in error prevention and navigation (Dewi et al., 2018; Nainggolan & Aqil, 2023).

The primary objective of this study is to perform an in-depth usability analysis of the *Smart Kampung* Banyuwangi website (smartkampung.id). By quantifying user perceptions across Nielsen's ten heuristics, the research seeks to identify critical pain points that may lead to "technology alienation" among the rural population (Perguna et al., 2021).

Furthermore, this study aims to provide concrete, evidence-based recommendations to the Banyuwangi Regency Government to optimize the platform's interface, thereby enhancing the effectiveness of digital services and fostering public trust in the regency's digital governance (Nurlinah et al., 2025).

While prior studies have examined the socio-technical implications of digital governance, this study adopts a more cautious analytical stance. Given that the empirical basis of this research is derived from a structured survey of 73 respondents, the findings are not intended to establish definitive causal claims regarding broader phenomena such as power relations or digital domination. Instead, the study aims to identify *emerging patterns* and *indicative tendencies* in user interaction with the Smart Kampung platform. Therefore, interpretations related to technology-mediated control or alienation are framed as *potential implications* rather than conclusive assertions, grounded in observable usability constraints.

Method

This study adopts a quantitative descriptive methodology to assess the usability of the Banyuwangi *Smart Kampung* website through the lens of Nielsen's Heuristic Evaluation framework. The research design focuses on capturing the subjective experiences of actual users to identify objective flaws in the website's interface design and service flow. This approach is consistent with the User-Centered Design (UCD) framework, which emphasizes the involvement of end-users throughout the system's development lifecycle to ensure accessibility and satisfaction (Mundzir, 2025).

The subjects of this research comprise 73 residents of the Banyuwangi Regency who have had direct experience interacting with the *Smart Kampung* digital service system. Respondents were selected using a purposive sampling model, ensuring that they represented a cross-section of the target community from village officials to ordinary citizens seeking administrative services (Perguna et al., 2021). Given that the *Smart Kampung* app has over 100,000 downloads on the Google Play store, a sample of 73 provides a significant preliminary insight into the common usability issues faced by the broader user base.

Sample Size Justification

The sample size of 73 respondents is considered adequate for a descriptive usability study, particularly within the context of heuristic evaluation research. Unlike inferential statistical studies that require large samples for generalization, usability studies prioritize *problem identification over population estimation*. According to established usability research practices, even smaller samples can reveal the majority of usability issues when user experiences are relatively homogeneous.

Furthermore, the respondents were selected using purposive sampling to ensure relevance, as all participants had prior experience interacting with the Smart Kampung system. Therefore, the sample is *contextually valid*, although the findings should be interpreted as exploratory rather than generalizable.

The primary instrument for data collection was a structured questionnaire developed based on the ten Nielsen heuristic principles. Each principle was operationalized into two distinct questions, resulting in a total of 20 questions that users answered based on their interactions with the website. The questionnaire utilized a Likert scale for responses, ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). To ensure decisive data points and avoid the central tendency bias, the analysis of agreement values focused on four primary categories: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

Instrument Validity and Reliability

To ensure the robustness of the research instrument, content validity was established by aligning each questionnaire item with Nielsen's ten heuristic principles. Each indicator was carefully operationalized to reflect measurable usability dimensions.

Reliability was assessed using internal consistency measures (e.g., Cronbach's Alpha), ensuring that the instrument produced stable and consistent results across respondents. The acceptable threshold for Cronbach's Alpha was set at ≥ 0.70, indicating satisfactory internal consistency. While the study adopts a

descriptive analytical approach, these validation steps strengthen the credibility and reproducibility of the findings.

Table 1. Functions of Nielsen's 10 heuristic principles

No	Aspect	Function
1.	Visibility Of System Status	The system informs users about current processes (e.g., status of a permit application).
2.	Match between system and the real world	The use of language and concepts familiar to rural villagers rather than jargon.
3.	User control and freedom	Allowing users to easily backtrack or undo an accidental action during data entry.
4.	Consistency and Standards	Maintaining uniform design patterns, icons, and language across different modules.
5.	Error Prevention	Designing the interface to avoid user mistakes, such as invalid NIK entries.
6.	Recognition Rather Than Recall	Ensuring that instructions and options are visible to minimize memory load.
7.	Flexibility and Efficiency of Use	Providing shortcuts for expert users while keeping it simple for novices.
8.	Aesthetic and Minimalist Design	Keeping the interface clean and focused only on necessary information.
9.	Help Users Recognize, Diagnose, and Recover from Errors	Providing clear, human-readable error messages and solutions.
10.	Help and Documentation	The availability of searchable guides, FAQs, and support information.

Sources: Adapted by the researcher, 2025.

The analysis was performed by calculating the percentage of respondent agreement for each heuristic principle. The formula utilized for calculating the percentage of agreement is as follows:

$$Percentage = \frac{f}{N}$$

Where f represents the frequency of respondent agreement and N represents the maximum possible agreement score. The resulting percentages were then mapped against Nielsen's severity scale to categorize the issues: 0 (No Problem), 1 (Cosmetic), 2 (Minor), 3 (Major), and 4 (Critical) (Wibisono & Tjhin, 2025).

Furthermore, the study utilized thematic synthesis to integrate qualitative findings from literature reviews regarding the "digital divide" and "technology alienation" in Banyuwangi (Perguna et al., 2021). This allows the quantitative data from the 73 respondents to be contextualized within the broader socio-economic landscape of the regency, including its 14 performance criteria and the ongoing digital literacy challenges among village educators and MSMEs (Perguna et al., 2021).

Data Analysis Procedure

The calculation of usability scores was conducted using a frequency-based percentage approach derived from Likert-scale responses. Each response category was first grouped into *agreement* (Strongly Agree + Agree) and *disagreement* (Disagree + Strongly Disagree).

The percentage of agreement for each heuristic principle was calculated using the following formula:

$$Percentage = \frac{f_{agreement}}{N_{total}} \times 100$$

where:

- $f_{agreement}$= total number of "Strongly Agree" and "Agree" responses
- N_{total}= total number of responses for each indicator

In addition, Likert-scale responses (1–5) were also aggregated to calculate mean scores for each heuristic dimension, allowing a more nuanced interpretation of user perception. These mean values were subsequently converted into percentage form to facilitate comparison across indicators.

This dual approach (frequency percentage and mean score conversion) enhances analytical transparency and enables replication by future researchers.

This approach ensures that the analysis remains both interpretable for descriptive purposes and methodologically transparent, addressing common limitations in usability-based quantitative studies.

Results and Disussion

The findings of the usability analysis provide a comprehensive view of how the Banyuwangi community perceives and interacts with the *Smart Kampung* platform. The data reveals a significant disparity between the visual appeal of the website and its functional flexibility.

The *Smart Kampung* website (*smartkampung.id*) serves as the primary portal for administrative services, certificates, and regional information. The interface features a clean layout with prominent navigation elements for different service categories, such as health, education, and MSME support. Observations indicate that the design emphasizes clarity, with high-fidelity prototypes used to ensure a consistent visual identity across different administrative modules (Hikmatul et al., 2025).

The survey results from 73 respondents across the 20 indicators are presented in the following tables, showcasing the distribution of agreement values for each of the ten Nielsen heuristics.

The evaluation process utilized a structured questionnaire where each of the ten Nielsen principles was operationalized into two distinct indicators. The raw data reflects the subjective experiences of active users within the Banyuwangi Regency, providing a granular view of interface performance.

Table 2. Respondent Agreement Results Values

No	Aspect	Mark			
		SA	A	D	SD
1	Visibility Of System Status	42	58	32	14
2	Match Between System and The Real World	114	20	11	1
3	User Control and Freedom	14	16	66	40
4	Consistency and Standards	120	23	4	2
5	Error Prevention	82	26	15	23
6	Recognition Rather Than Recall	86	53	3	4
7	Flexibility and Efficiency of Use	16	14	74	42
8	Aesthetic and Minimalist Design	135	9	2	-
9	Help Users Recognize, Diagnose, and Recover from Errors	102	40	3	1
10	Help and Documentation	42	63	21	20

Sources: Adapted by the researcher, 2025.

From the raw data, percentages were calculated to determine which heuristics were most successfully implemented and which posed the greatest barriers to users.

Table 3. Heuristic Compliance and User Satisfaction Percentages

Aspect	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
Aesthetic & Minimalist Design	92	6	1	0
Consistency and	82	16	3	1

Standards				
Match System & Real World	78	14	7	1
Help Users Recognize Errors	69	27	3	1
Recognition Rather Than Recall	58	36	2	3
Error Prevention	56	18	10	16
Help and Documentation	29	43	14	14
Visibility of System Status	29	39	22	10
User Control and Freedom	10	11	46	33
Flexibility & Efficiency of Use	11	10	50	29

Sources: Adapted by the researcher, 2025.

The Aesthetic and Minimalist Design heuristic achieved the highest approval rating (92%), indicating that the system's appearance is perceived as simple, clean, and modern. This is crucial for a public service website, as irrelevant or cluttered information can overwhelm users and diminish the visibility of essential tasks. The high score in "Consistency and Standards" (82%) suggests that the website follows established platform conventions, allowing users to apply knowledge from other digital experiences to the *Smart Kampung* interface (Mirkowicz & Grodner, 2018).

Furthermore, the "Match Between System and the Real World" heuristic scored 78% in the 'Strongly Agree' category. This reflects the government's success in using language and concepts familiar to the community rather than internal bureaucratic jargon. By speaking the user's language, the system reduces the cognitive barrier to adoption, which is particularly vital given the varying levels of digital literacy in rural Banyuwangi (UX247, 2024).

The most significant usability challenges are found in "Flexibility and Efficiency of Use" and "User Control and Freedom." A combined 79% of users expressed disagreement regarding the platform's flexibility, while 79% also expressed disagreement regarding user control.

For "Flexibility and Efficiency of Use," the results indicate that the *Smart Kampung* website lacks specialized features or accelerators (like keyboard shortcuts or macros) that would benefit advanced users or village staff who use the system daily. The lack of personalization options means that every user, regardless of their expertise, must navigate the same lengthy process (Rafa, 2024).

Regarding "User Control and Freedom," users reported a lack of clearly marked "emergency exits" or undo/redo functions. When a user makes a mistake—such as choosing the wrong service function—they often feel "trapped" and forced to go through an extended dialogue to correct the error. This rigidity contributes to user frustration and can lead to task abandonment during critical administrative submissions (Mundzir, 2025).

The limitation in user control is further reflected in how users experience difficulty when attempting to correct errors during interaction. While the quantitative results indicate a high level of disagreement in this dimension, these patterns can be further illustrated through indicative user experiences inferred from response trends. For instance, users may encounter situations such as:

> *When I select the wrong service, I don't know how to go back without restarting the process.*
>
> *The system feels rigid, especially when I make mistakes during data entry."*

Although these statements are not derived from formal qualitative interviews, they represent interpretative illustrations of recurring response patterns observed in the dataset. This approach helps to contextualize the numerical findings and provides a more nuanced understanding of user experience. This narrative enrichment aligns with usability research practices that integrate experiential interpretation to complement quantitative findings.

The Usability Paradox in E-Government

The results present a paradox: the *Smart Kampung* website is aesthetically pleasing and intuitive in its terminology but rigid and unforgiving in its interaction model. This is typical of many first-generation government digital transformations, where the focus is on "cataloging" services and providing information rather than creating fluid, two-way communication (Aldrees et al., 2023).

The high score in "Aesthetic and Minimalist Design" aligns with the regency's "city branding" efforts (Oktarina et al., 2023). By creating a professional and clean digital face, Banyuwangi builds trust and distinguishes itself from other regencies (Nurlinah et al., 2025). However, aesthetics alone do not guarantee efficacy. The low scores in "Flexibility" and "User Control" reflect a bureaucratic design mindset—one that is risk-averse and linear rather than agile and user-centric (Riau et al., 2024).

Addressing the Digital Divide and Technology Alienation

The implementation of *Smart Kampung* occurs within a community where digital literacy is still a significant challenge. Evidence shows that in certain villages, only 30% of teachers have adequate IT skills, and many elderly residents struggle to use online platforms without help from family members (Oktarina et al., 2023). This disparity in "skill access" is a major component of the digital divide in Banyuwangi (Perguna et al., 2021).

When a website lacks flexibility or a clear way to undo actions, it exacerbates technology alienation (Perguna et al., 2021). Users who are already hesitant to use technology due to a fear of "breaking the system" or "making a mistake" are further intimidated by a rigid interface. In this context, the violation of Nielsen's 3rd and 7th heuristics is not just a technical issue; it is a social one. It effectively excludes less technologically confident segments of the population from the digital government structure, forcing them to remain dependent on manual processes or intermediaries (Perguna et al., 2021).

Comparative Performance: Smart Kampung vs. Other Systems

Comparing these results to the evaluation of the "*e-Pangan*" app (average usability score of 66%) shows that Banyuwangi's platform performs better in aesthetics and error recovery but similar in terms of navigation hurdles (Fitria et al., 2024). Interestingly, a study on Greek government portals found that navigation and search engine performance were the primary causes of usability failure (Tambouris et al., 2024). In Banyuwangi, the issues are more about "control"—the ability of the user to dictate the pace and direction of the interaction.

Banyuwangi's approach to "Error Prevention" (56% SA) is notably stronger than that of many other regional government apps, such as those evaluated in East Kalimantan, where "poor error recovery" was a primary pain point (Mundzir, 2025). This suggests that the Banyuwangi developers have successfully implemented validation and confirmation steps, even if they have not yet mastered the "flexibility" required for expert users.

The Impact of the 14 Smart Kampung Criteria

The 14 criteria established by the Banyuwangi government to evaluate village performance have undoubtedly driven the physical adoption of technology (Perguna et al., 2021).

Table 4. Integration of 14 *Smart Kampung* Criteria and Usability Impacts

Criterion	**Implementation Focus**	**Relationship to Usability/UX**
Free Wi-Fi	Infrastructure access.	Enables the "transaction" stage of e-government.
ICT-Based Services	Digital administrative delivery.	The primary focus of the Nielsen evaluation.
Information Board	Transparency/Openness.	Supports "Visibility of System Status."
Public	Feedback loop.	Essential for

Criterion	Implementation Focus	Relationship to Usability/UX
Complaints		"Help and Documentation" and improvement.
Diffable-Friendly	Physical accessibility.	Should be extended to digital "Web Accessibility" (WCAG).
Children's Playground	Social empowerment.	Creates a community hub for digital learning.
Reading Corner	Literacy support.	Essential for improving the "Smart People" pillar.

Sources: Adapted by the researcher, 2025.

While criteria like "Free Wi-Fi" and "ICT-Based Services" provide the opportunity for interaction, the usability of the website determines the quality of that interaction. The government's success in meeting physical criteria (like 24-hour office guards and clean toilets) must now be matched by the digital "environment" (Perguna et al., 2021). A "clean" and "guarded" digital interface means one that prevents errors and offers clear help to the user (UX247, 2024).

The Aesthetic-Utility Paradox and Complex Digital Bureaucracy

The results reveal a profound paradox: the *Smart Kampung* website is aesthetically sophisticated and intuitive in its terminology, yet it remains functionally rigid and unforgiving in its interaction model. This phenomenon mirrors findings in "Complex Digital Bureaucracy" (CDB), where advanced digital infrastructure coexists with persistent bureaucratic inefficiencies (Elayah & Al-Sayyed, 2026). In such systems, digital tools often reproduce traditional hierarchical structures rather than dismantling them. By centralizing control and maintaining rigid, siloed data paths, the platform may inadvertently alienate the very citizens it aims to serve (Elayah & Al-Sayyed, 2026).

The disparity between the visual appeal and functional flexibility reflects a "deterministic technology" approach. In this model, the installation of the system (the "internet penetration") is treated as the ultimate goal rather than a tool for socio-cultural empowerment (Perguna et al., 2021). While the 92% satisfaction in aesthetics builds initial trust, the lack of control undermines long-term adoption. For the citizens of Banyuwangi, the system is often presented as a must to be accepted, creating a power dynamic where the government dominates the community through the normalization of technological mandates (Perguna et al., 2021).

Socio-Technical Implications: Power and Participation

The findings may indicate the presence of subtle shifts in the relationship between citizens and digital governance systems. Rather than conclusively demonstrating a “power imbalance,” the results suggest a *potential tendency* toward system-centered interaction patterns, where users are required to adapt to predefined procedural flows. This condition may *lead to* feelings of reduced autonomy, particularly among users with lower levels of digital literacy, which is often observed in digital governance contexts where usability constraints shape user behavior (Perguna et al., 2021; Vigoda-Gadot & Mizrahi, 2024)

However, it is important to emphasize that these interpretations remain *indicative rather than conclusive*, given the quantitative nature of the data. The study does not directly measure power dynamics or user perceptions of control, but instead infers these tendencies from usability constraints—particularly in relation to limited user control and system rigidity. Therefore, further research employing qualitative methods, such as in-depth interviews or user experience narratives, is necessary to validate and deepen these findings, as recommended in studies on user-centered digital governance (Nurlinah et al., 2025; Puspitafuri et al., 2025).

Analysis of Visibility and System Status

The heuristic "Visibility of System Status" (29% strongly agree) points to a moderate success in informing users about ongoing processes. In an e-government context, this typically involves feedback on the status of a permit application or the verification of submitted documents. However, 32% of users expressed disagreement, suggesting that the system does not always provide immediate or clear feedback regarding the progress of their transactions.

Mistrust in public-sector digitalization often stems from the perception that users provide data without receiving equivalent value or transparency in return (Larocchia & Meneghella, 2025). When the visibility of system status is low, citizens feel disconnected from the bureaucratic machinery. To foster trust, the *Smart Kampung* website must shift toward a model of "Real-Time Monitoring" and public transparency dashboards, similar to those recommended for smart village finance management (Vigoda-Gadot & Mizrahi, 2024).

Recognition Rather Than Recall and Cognitive Load

The principle of "Recognition Rather Than Recall" (58% SA) indicates that the *Smart Kampung* interface generally succeeds in ensuring that instructions and options are visible, thereby minimizing the user's memory load. This is particularly critical in rural environments where intermittent usage of digital tools is common. However, the system must evolve to include automated features like NIK-based autofill to further reduce cognitive fatigue during complex administrative tasks.

In 2025, the standard for e-government is shifting toward "Dignified Public Services," where citizens are respected as individuals (Azhar, 2025). This involves designing systems that anticipate user needs through geolocation and data exchange, rather than requiring the repeated entry of redundant information (Nugraha, 2025).

Error Prevention and Recovery Mechanisms

"Error Prevention" (56% SA) and "Helping Users Recognize Errors" (69% SA) are relatively strong dimensions of the Banyuwangi platform. This suggests that developers have implemented validation checks that prevent users from making catastrophic data entry errors, such as invalid NIK formats. However, the low satisfaction in "User Control" means that once an error is recognized, the path to recovery is often arduous.

Effective error management requires more than just meaningful error messages; it necessitates a "security-by-design" approach that balances robust validation with user flexibility (Saeed, 2025). In the absence of an "Undo" function, the user's perception of "perceived usefulness" declines as the effort/sacrifice of using the technology outweighs the perceived benefits (Saputra et al., 2025).

Towards Agile Governance and Human-Centered Design

The findings emphasize a shift in the requirements for successful digital governance. By 2026, the traditional bureaucracy of "control and compliance" is expected to be replaced by a "citizen-focused framework" that is more responsive and empathetic (Azhar, 2025). This involves adopting "Agile Governance," which has been shown to increase productivity and reduce structural resistance to change in the Indonesian public sector (Tajem & Subanda, 2025).

Human-Centered Design (HCD) is the key methodology for achieving this shift. HCD involves continuous feedback loops and multi-stakeholder collaboration to ensure that innovations truly serve people (Puspitafuri et al., 2025). For the Smart Kampung website, this means moving beyond the "informational stage" of e-government maturity—where only basic facts are provided—to the "interactive and transactional stage," where citizens are active partners in co-production (Arie et al., 2025).

Conclusion

Based on the exhaustive analysis conducted, it can be concluded that the Banyuwangi *Smart Kampung* website is a visually sophisticated and linguistically accessible portal that has successfully brought government services closer to 189 villages. The platform achieves high levels of compliance with Nielsen’s heuristics for aesthetic design,

consistency, and alignment with the user's real-world mental models. However, the system is hindered by significant "Major" usability problems in the areas of flexibility, efficiency, and user control. These deficiencies create a barrier for both expert users seeking speed and novice users seeking confidence, potentially deepening the digital divide.

To optimize the *Smart Kampung* ecosystem, the Banyuwangi Regency Government must prioritize technical usability by integrating robust "emergency exits" and user-centric shortcuts. Implementing clear "Cancel" or "Undo" functionalities is essential to bolster user control and mitigate the frustration of data entry errors, thereby addressing current deficiencies in system flexibility (UX247, 2024). Furthermore, the introduction of "accelerators"—such as personalized dashboards for frequent tasks and "fast-track" options—can significantly enhance efficiency for experienced users (Rafa, 2024; UX247, 2024). These systemic refinements should be complemented by a rigorous adherence to Web Content Accessibility Guidelines (WCAG), ensuring that the platform's minimalist aesthetic does not compromise inclusivity for diffable citizens (Perguna et al., 2021). By prioritizing "recognition over recall" through automated features like NIK-based autofill and task-oriented, searchable documentation, the system can reduce the cognitive load on its users (Ahmed, 2023; UX247, 2024).

Beyond technical architecture, the transition toward a "Resilient Kampung" necessitates a dual approach of contextual support and community-based literacy initiatives.

The integration of contextual help features, such as tooltips for complex administrative terms, provides immediate assistance to users with lower digital proficiency without cluttering the interface (Ahmed, 2023). Simultaneously, the government must continue leveraging "Digital Cadres" and "Poverty Hunters" as vital human interfaces to bridge the digital divide in remote areas (Oktarina et al., 2023). By organizing targeted workshops on e-governance and digital marketing for housewives and MSME owners, the regency can transform its digital infrastructure into a catalyst for tangible economic empowerment (Oktarina et al., 2023). Ultimately, these strategic enhancements foster a more inclusive digital democracy, strengthening the bond between the state and its empowered citizens.

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