



A Qualitative Usability Evaluation of Document-Like Web Interfaces for Village Administrative Staff

Angga Lisdiyanto^{1*}, Agussalim², Laqma Dica Fitrani³, Miftahus Sholihin⁴, Syahri Mumin⁵, Tri Septianto⁶,
Winarti⁷, Vinza Hedi Satria⁸

^{1,2}Departemen of Magister Information Technology, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Indonesia

³Departemen of Digital Bussiness, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Indonesia

⁴Departemen of Informatics, Universitas Islam Lamongan, Indonesia

⁵Departemen of Information System, Universitas Nahdlatul Ulama Sidoarjo, Indonesia

⁶Departemen of Information Technology, Politeknik Negeri Madiun, Indonesia

⁷Departemen of Informatics, Universitas Darul Ulum, Indonesia

⁸Departemen of Informatics, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Indonesia

Correspondence E-mail: angga_lisdiyanto.mti@upnjatim.ac.id

ABSTRACT

Village offices in Indonesia are adopting digital administration, but staff struggle with standard web forms. These forms feel unfamiliar because they separate data entry from the final letter. This study examines whether a document-like web interface eases administrative work for staff. The interface resembled an A4 letter, with input fields inside its sentences. We used Cognitive Walkthrough, Retrospective Think-Aloud, and JavaScript logging to see how users worked. Eight village staff participated. They completed tasks on a conventional web form (System A) and the document-like interface (System B). We recorded completion time, idle time, clicks, and backspace use. Results show System B was faster and required fewer clicks and corrections. Users felt confident because the screen looked like the letters they type. These findings suggest that familiar, document-like interfaces reduce confusion and support low-literacy users in rural e-government services.

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ARTICLE INFO

Article History:

Submitted/Received 09 Oct 2026

First Revised 12 Oct 2026

Accepted 21 Oct 2026

First Available online 22 Oct 2026

Publication Date 22 Oct 2026

Keyword:

Usability

Document-like interface

Skeuomorphic design

Rural administration

E-government

Qualitative evaluation

1. INTRODUCTION

In many villages across Indonesia, administrative work still revolves around paper and Microsoft Word [1]. Staff type letters, fill in citizen data, and print documents for signatures. This way of working has been around for decades. It is not efficient, but it is familiar. When the government introduces web-based administrative systems, the transition is often harder than expected. The problem is not only about internet access or computers [2]. It is also about how the interface feels to people who are not used to digital tools [3].

Most village administrative staff have low to medium digital literacy [1]. They know how to type a letter, but they are not comfortable with abstract web forms. Conventional e-government systems usually present data entry as a series of isolated text boxes. The user has to fill in one box, move to the next, and imagine how the final letter will look. This creates a mental gap. Users have to translate what they see on the screen into the document they are trying to produce. For people with limited digital experience, this translation is not easy. Studies have shown that flat, minimalist interfaces can slow down older and novice users, and increase the number of errors they make [4][5].

Skeuomorphic design offers a possible solution. Skeuomorphism means making digital objects look like their physical counterparts [6][7]. In this case, a web interface can be designed to look like a paper document. The input fields are placed directly inside the sentences of the letter. Users type into the letter itself, not into separate boxes. This approach leverages the user's existing mental model. Instead of learning a new system, they are doing what they already know: filling in a printed form or typing a letter [8][9].

Several studies have explored skeuomorphism for older adults and low-literacy users. Lee et al. found that paper-like structures in digital kiosks improved ease of use for older adults [9]. Liu et al. showed that familiar icons reduce cognitive burden [8]. Medhi-Thies et al. demonstrated that text-free interfaces can help illiterate users [10]. However, most of this research focuses on kiosks, mobile apps, or general user interfaces. There is still very little work on document-like web interfaces specifically for rural village administration. Most e-government studies also rely on surveys and statistical models like TAM or UTAUT. They rarely look at what happens at the interface level—the small pauses, the clicks, the corrections [9][10].

This study tries to fill that gap. We designed a web interface that looks like an A4 official letter. Village staff can enter citizen data directly into the letter's sentences. We then compared it with a conventional web form. We wanted to know three things:

- a. RQ1: How does the document-like interface affect task completion time, idle time, navigation clicks, and backspace use?
- b. RQ2: How do users describe their experience with the interface?
- c. RQ3: What mechanisms explain why visual familiarity and contextual data entry reduce cognitive friction?

By answering these questions, we hope to provide practical design guidance for e-government systems in rural areas.

2. METHODS

2.1. Research Design

We used a triangulation approach. This means we combined two qualitative methods—Cognitive Walkthrough (CW) and Retrospective Think-Aloud (RTA)—with automated behavioral logging. The logging was done through a JavaScript script embedded in both systems. This script recorded four things: task completion time, idle time between fields,

navigation clicks, and backspace presses. The combination of methods allowed us to see not only what users did, but also why they did it. The overall design is illustrated in **Figure 1**.

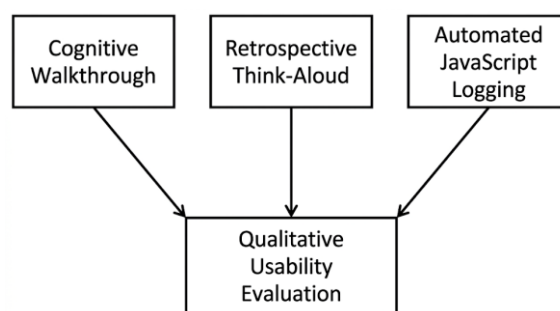


Figure 1. Research Design Triangulation Diagram

2.2. Participants

Eight administrative staff from rural village offices in East Java, Indonesia, took part in the study. They were selected using purposive sampling. All participants had experience drafting official letters and handling citizen data. Their digital literacy ranged from low to medium. None of them had prior experience with the document-like interface. The small sample size is appropriate for an exploratory qualitative study. The goal is not statistical generalization but analytical generalization [11]. Participation was voluntary, and we obtained informed consent.

2.3. Procedure

The evaluation took place in the participants' own offices. This was done to keep the setting as natural as possible. The procedure had three phases.

Phase 1: Introduction and Familiarization. We explained the purpose of the study and the tasks. Participants were given five minutes to try both interfaces. They were not trained on how to complete the tasks.

Phase 2: Task Execution with Logging. Each participant completed two tasks: entering data for a population report and filling in a letter of domicile. They did this on two systems:

- a. System A (Conventional): A standard web-based e-government form. It had isolated text boxes arranged from top to bottom. **Figure 2** shows the layout of this conventional form.

Input Surat Keterangan Warga

Silakan isi kolom formulir di bawah ini dengan lengkap untuk menerbitkan surat keterangan.

1. Identitas Surat

Jenis Surat: SURAT KETERANGAN
 Nomor Surat (Otomatis / Manual): 470 / 003 / 413.311.10 / 2025

2. Data Penandatanganan (Pejabat Desa)

Nama Pejabat: MADARI
 Jabatan: Kepala Desa Nogojatisari
 Alamat Instansi / Pejabat: Dusun Nogo, Desa Nogojatisari, Kecamatan Sambeng, Kabupaten Lamongan

3. Data Warga (Pemohon Surat)

Nomor NIK *: 1111
 Nama Lengkap Warga *: Angga Tes
 Tempat Lahir:
 Tanggal Lahir:

Figure 2. Conventional Web Form Interface (System A)

- b. System B (Document-Like): A web interface designed to look like a physical A4 letter. Data entry fields were embedded directly inside the sentences. The document-like interface is shown in **Figure 3**.

PEMERINTAH KABUPATEN LAMONGAN
KECAMATAN SAMBENG
DESA NOGOJATISARI
Alamat : Jl. Raya Mantup - Sambeng No. 12
SAMBENG - 62284

SURAT KETERANGAN
Nomor : 472 / 009 / 413 .311.10 / 2025

Yang bertanda tangan di bawah ini, Kepala Desa Nogojatisari, Kecamatan Sambeng, Kabupaten Lamongan, dengan ini menerangkan bahwa :

Nama: Anggi Tes
Jenis Kelamin: Perempuan
Tempat / Tanggal Lahir: SURABAYA, 28-09-1992
Status: Pernah Kawin
Nomor NIK: 1112
Agama: Islam
Pekerjaan: Buruh
Alamat: NOGO, RT 010 / RW 001, Desa Nogojatisari, Kecamatan
Keterangan: 1. Bahwa orang tersebut berdomisili di NOGO, RT 010 / RW 001,

Figure 3. Document-Like Skeuomorphic Interface (System B)

To avoid order effects, we counterbalanced the presentation. Some participants used System A first, others used System B first. The JavaScript logging script recorded all interactions silently.

Phase 3: Retrospective Think-Aloud and Cognitive Walkthrough. After finishing the tasks, participants watched a screen recording of their own session. They were asked to speak aloud about what they were thinking and feeling at each step. We also conducted a Cognitive Walkthrough using a set of structured questions [12]. All audio was recorded and transcribed.

2.4. Data Analysis

Quantitative log data were summarized using descriptive statistics. Qualitative data from RTA and CW sessions were analyzed using thematic analysis [13]. We looked for patterns related to cognitive load, confidence, and mental model alignment.

3. RESULTS AND DISCUSSION

3.1. Objective Behavioral Metrics

The JavaScript logs showed clear differences between the two systems. **Table 1** summarizes the results.

Table 1. Comparison of objective usability metric

Metric	System A (Conventional)	System B (Document-Like)	Reduction
Mean Task Completion (sec)	264.69	149.00	43.7%
Mean Idle Time (sec)	82.88	27.94	66.3%
Mean Navigation Clicks	24.31	11.81	51.4%
Mean Backspace Count	17.13	4.94	71.2%

On System A, users paused frequently between fields. These pauses were especially long when they had to figure out where their input would appear in the final letter. On System B, the flow was much smoother. Idle time dropped by about two-thirds. Users also clicked less and made fewer corrections. The backspace count was 71% lower on System B. This suggests that the contextual layout helped them enter data correctly on the first try.

The differences in completion time and idle time are also visualized in **Figure 4**. Meanwhile, **Figure 5** presents the comparison of navigation clicks and backspace counts.

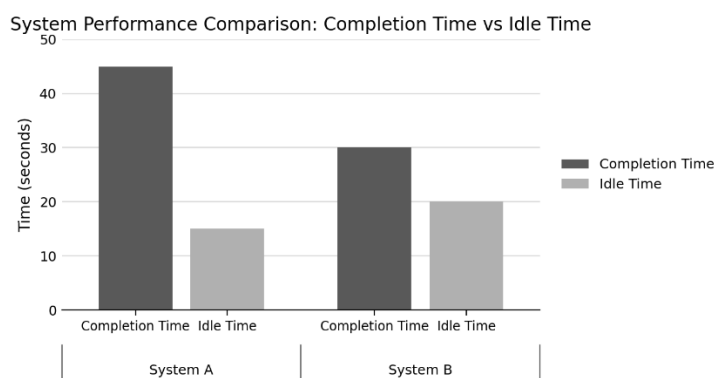


Figure 4. Comparison of Mean Task Completion Time and Idle Time

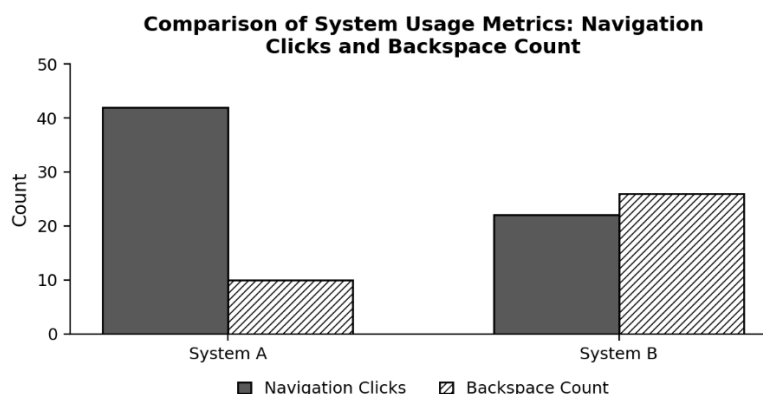


Figure 5. Comparison of Mean Navigation Clicks and Backspace Count

3.2. Retrospective Think-Aloud Findings

Two main themes emerged from the RTA transcripts.

Theme 1: Feeling safer and more confident. Participants said they preferred the document-like design because it looked like the letters they usually type. One participant said: “When I use the standard form, I am always worried I will type in the wrong box because I cannot see the whole letter. With this new system, it feels like typing on a regular piece of paper. The data just fits into the sentences.” This fear of making mistakes is a big barrier for low-literacy users. System B reduced that fear. The familiar layout gave them a sense of psychological safety.

Theme 2: Less mental mapping. Users also talked about how confusing System A was. They felt “lost” and “confused” about the order of the form. With System B, they described the process as “effortless” and “straightforward.” They could “see the whole picture.” This matches the idea of mental model alignment. Their existing knowledge of word processors

transferred directly to the web interface. They did not have to build a new mental model from scratch. These themes and their sub-themes are summarized in **Figure 6**.

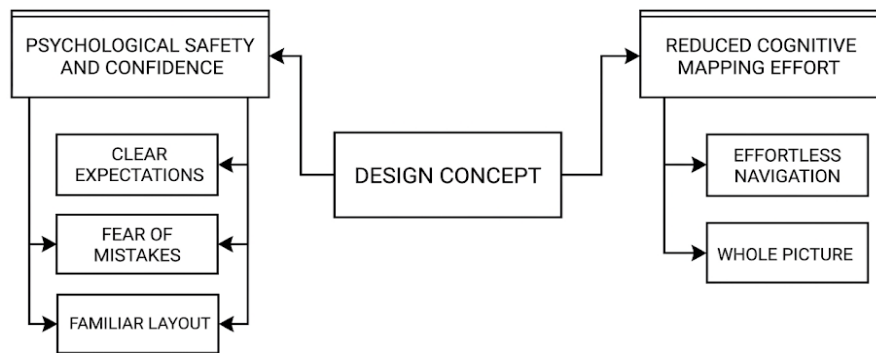


Figure 6. Thematic Map of User Experience

The Cognitive Walkthrough confirmed these findings. On System B, participants correctly identified the next action at each step. On System A, they often failed to notice that they needed to scroll down or that a field was optional. This led to hesitation and a loss of confidence.

3.3. Discussion

Our findings support previous research on cognitive accessibility. Concrete, familiar visual cues work better than abstract designs for novice users [10][8]. The triangulation of objective logs and subjective feedback gives us a clearer picture of why this happens. The proposed cognitive bridge model is depicted in **Figure 7**.

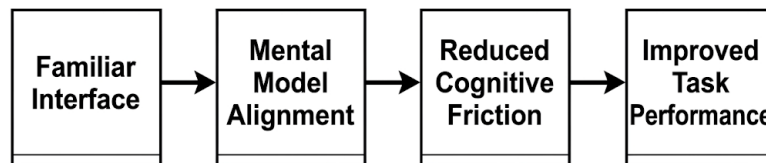


Figure 7. Cognitive Bridge Model

First, familiarity reduces cognitive friction. The 66.3% drop in idle time on System B is the strongest evidence. This is not just about saving time. It shows that users spent less mental effort on mapping. On System A, they had to translate abstract fields into the concept of a letter. On System B, the interface was the letter. No translation needed.

Second, the benefit is not just visual familiarity. It is also procedural familiarity. Users were not just looking at a familiar object. They were performing a familiar action: filling in blanks within a text. This is an important distinction. It suggests that e-government interfaces should mimic the workflow of the traditional paper-based task, not just its appearance.

Third, the reduction in backspace use is a behavioral sign of increased confidence. Fewer corrections mean users are making correct first guesses about where to input data. This confirms that the interface aligns with their expectations.

These findings have practical implications. We should not assume that flat design is always best. For tech-savvy users, it may be fine. But for low-literacy populations, it can be a barrier [9][10]. Designers should consider re-mediating existing workflows instead of reinventing them. The goal is to build a cognitive bridge that helps users move from analog to digital.

4. CONCLUSION

This study provides evidence that document-like interfaces can help address the digital divide in rural administration. By replacing fragmented web forms with visually cohesive

digital letters, we reduced cognitive friction. Users were faster, clicked less, and made fewer corrections. They also felt more confident.

The main limitation is the small sample size. We cannot claim statistical generalization. The findings offer analytical generalization instead. They give us a deep understanding of how and why this interface works in a specific rural context. Future research should test this approach across more villages and with more participants. Longitudinal studies could also look at whether long-term use improves digital literacy.

5. ACKNOWLEDGMENT

We thank the village administrative staff who participated in this study. Their honesty and patience made this research possible. We also thank Universitas Pembangunan Nasional Veteran Jawa Timur for supporting this work.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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