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User Interface Improvement by Evaluating Usability and User Experience: Case Study of Indonesia's Government Financial Management Information System

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Abstract

Sakti is an enterprise resource planning system developed by Indonesia's Ministry of Finance, integrating 11 modules to support state budget management. Despite Sakti's critical role, a decline in the 2023 user satisfaction index highlighted usability and service quality issues. This study offers user interface improvement by evaluating the usability and user experience of Sakti's contract data recording feature. Qualitative and quantitative data were collected from 23 respondents. Quantitative data was obtained using a system usability scale (SUS) and user experience questionnaire (UEQ). These resulted in an initial SUS score of 67.39 (grade C) and a UEQ attractiveness index of 1.13. Qualitative data was obtained via open-ended questions, interviews, and usability testing, identifying 12 usability issues. A high-fidelity prototype, guided by user-centered design (UCD) principles, improved the SUS score to 84.35 (grade A+) and addressed usability challenges, indicating that the prototype used an intuitive and efficient interface that increased user satisfaction.

A. Introduction

Digitalization of state financial management is a strategic pillar for the Ministry of Finance of the Republic of Indonesia in creating efficient and transparent budget, revenue, and spending management. Sakti is part of an integrated financial management information system (IFMIS) framework that is used with the state treasury and budget system (SPAN) to be the core system for Indonesia's financial management [1]. Sakti is utilized by work units to handle the budget, including planning, reporting, and submitting budget disbursements through the SPAN. The interactions between Sakti and the SPAN are presented in Figure 1.

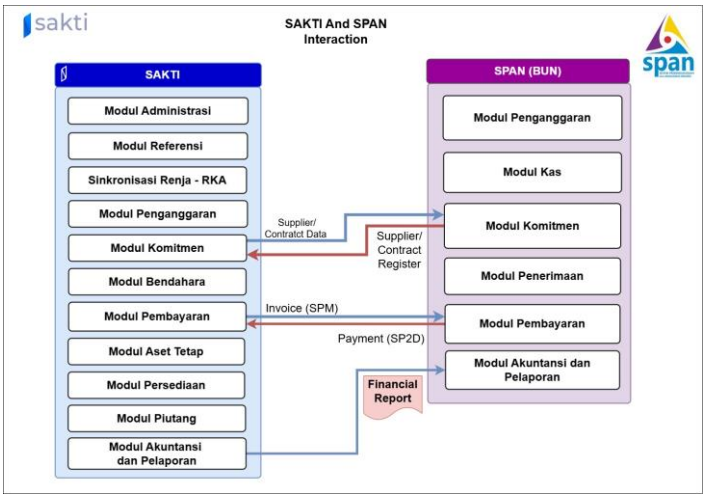

Figure1. Sakti and SPAN interaction patterns

As the only official application used by central government agencies to manage the state budget, Sakti facilitates the target of state budget disbursement reaching IDR 3,325.1 trillion in 2024 [2]. Therefore, this system's sustainability and optimization are crucial to supporting effective government budget management. However, based on observations of internal organizational documents, the user satisfaction index in 2023 showed a downward trend in several assessment aspects, as shown in Table 1, with a total decline of 0.08 points compared to 2022. This does not align with the organization's expectations, which aim for the user satisfaction index to increase every year. This study investigates two aspects that showed the most significant decline: system quality (down 0.13 points) and user satisfaction (down 0.11 points).

Table 1. Sakti user satisfaction index period 2020-2023

Variable	2020	2021	2022	2023	Index Decrease from 2022 to 2023
System Quality	4.48	4.53	4.65	4.52	**0.13**
User Satisfaction	4.52	4.55	4.68	4.57	**0.11**
Service Quality	4.50	4.53	4.63	4.55	0.08
Information Quality	4.60	4.59	4.71	4.65	0.06
Organizational Support	4.49	4.53	4.65	4.60	0.05
Net Benefit	4.59	4.59	4.72	4.70	0.02
Total Average	**4.54**	**4.56**	**4.68**	**4.60**	**0.08**

The maximum index scale for each year and variable is 5.0.

This decline indicates challenges in user experience that can impact the effectiveness and efficiency of system operations. From interviews with a subject matter expert (SME) and internal observations, it was determined that, although Sakti is designed with an agile approach to support technical flexibility, problems with the front-end and user interface are still the main factors affecting user satisfaction. Good system quality depends not only on technical reliability but also on users' ability to interact with the system intuitively and efficiently [3]. Therefore, usability and user experience evaluations are crucial to improve system quality and user satisfaction.

To ensure the success of user interface development, it is important to refer to international standards such as ISO 9241-210, which sets out optimal criteria for a user-centered design (UCD) approach. This standard outlines four main phases in the UCD process: understanding and defining the usage context, determining user needs, generating design solutions, and evaluating the resulting design [4]. These phases provide comprehensive guidelines for creating more effective interactions between users and systems, especially in the context of human–computer interaction (HCI).

In this study, the UCD approach is applied to evaluate the contract data recording feature in the Sakti application, which is designed to support government financial transactions. The UCD cycle shown in Figure 2 serves as a reference to analyze user needs and provide design recommendations that focus on efficiency and user satisfaction, thereby enhancing the overall system quality.

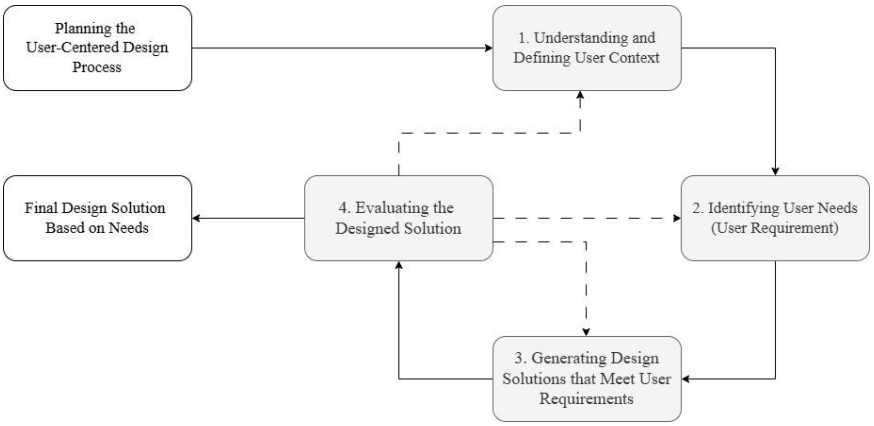

Figure2. Stages in the UCD approach

Following this approach, an in-depth evaluation of the Sakti user interface and user experience is needed to ensure that the system can optimally support the operation of work units. This study will provide recommendations based on empirical findings to overcome these problems, thereby improving the quality of Sakti services in the future. This study focuses on the evaluation of the contract data recording feature in the Sakti application, which is an important component in managing the state budget. This feature is studied because of its crucial role in supporting large-value transactions, especially related to government procurement regulations through contractual mechanisms. This specific feature has never been evaluated for usability and user experience, even though user interaction with the feature directly affects the efficiency and effectiveness of

system operations. With a focused research scope, it is hoped that the evaluation results and proposed design recommendations can provide a valuable contribution to improving this feature's quality and reliability.

Based on the problem formulation, this study addresses the following research questions (RQs):

- **RQ1.** How is the usability and user experience evaluation of the contract data recording feature in the Sakti application?
- **RQ2.** What are the recommended user interface design improvements for the contract data recording feature to enhance user satisfaction?
- **RQ3.** How is the usability evaluation of the recommended prototype design for improving the contract data recording feature in the Sakti application?

This study aims to evaluate the usability and user experience of the contract data recording feature in Sakti's Commitment Module. By identifying the root causes that affect user satisfaction, this study is expected to provide recommendations for a more user-friendly and efficient interface design. The results of this study are expected to not only improve the quality of the Sakti system but also provide insight for the development of other applications in the public sector that utilize enterprise resource planning.

B. Research Method

This study employs a mixed-methods approach with an exploratory research design, integrating the collection, analysis, interpretation, and reporting of both quantitative and qualitative data [5]. This approach includes quantitative data from the user experience questionnaire (UEQ) and system usability scale (SUS), as well as qualitative data from usability testing, open-ended questions, and contextual interviews with the development team and users of Sakti's contract data recording feature. Exploratory research is used to understand topics that have not been well explained, starting with a qualitative approach reinforced by quantitative analysis. This study also uses case studies to explore usability and user experience issues in depth, with findings based on contextual analysis and recommendations generated for improvement. An evaluative research paradigm is used to assess the effectiveness and quality of the feature's user interface through various methods, including questionnaires, open-ended questions, usability testing, and task scenarios. A purposive sampling technique is used, allowing for respondents to be selected based on relevant criteria so as to gain in-depth insights from experienced users.

This study begins by identifying the problem through data collection from organizational reports, developer interviews, and Sakti users in various roles that specifically use the contract-recording feature. It continues with a literature study to develop a theoretical framework based on usability evaluation, user experience, and interface design principles. Research instruments, such as the SUS, UEQ, and open-ended questions, were designed to evaluate the user context following a UCD approach. Data were collected and analyzed using coding, inter-rater validation, and usability heuristics principles.

The results of this analysis are the basis for designing a prototype solution using Shneiderman's eight golden rules of interface design. The prototype was

evaluated through usability testing, UEQs, and SUS surveys [6]. The prototype was created using Figma to simulate realistic interactions, and design recommendations were derived from this testing [7]. The final stage was a comprehensive evaluation, which produced suggestions for improvement to ensure the interface design is optimal for users' needs. The final conclusion was formulated through an inductive method. The research stages are shown in Figure 3.

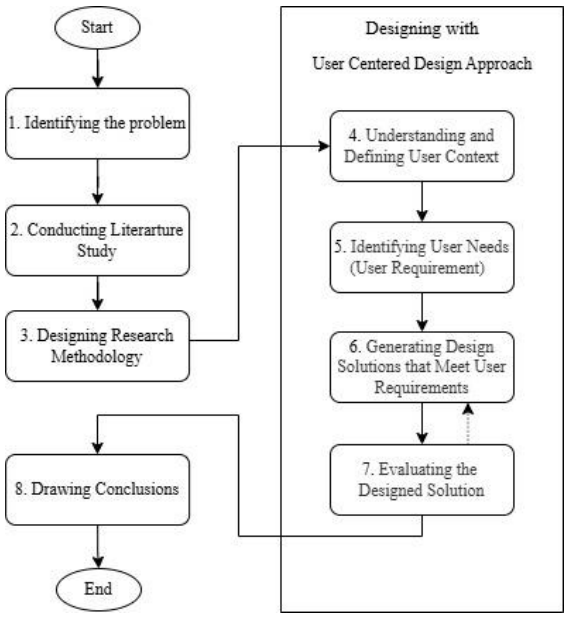

Figure3. Research stages

Data collection in this study is conducted in two stages. The first stage involves identifying respondents, distributing UEQs and SUS surveys online, and screening participants for usability testing related to Sakti's contract data recording feature. Respondents were categorized based on their Sakti user roles—namely, operational users, guidance/support users (i.e., help desk agents), training users, and development users (i.e., the Sakti development team)—each with distinct user IDs and system access levels. In addition to the surveys, qualitative data is collected through interviews and hybrid usability testing. The second stage focuses on evaluating the improved prototype through SUS surveys and usability testing to compare usability results before and after the improvements.

Data processing methods are divided into quantitative and qualitative. Quantitative data from the SUSs and UEQs surveys were processed using Microsoft Excel office automation. This data is used to measure the level of usability and user experience objectively. Table 2 below shows how the SUS score is translated into user satisfaction levels [6], [7], [8] while the UEQ dimensions describe the aspects of user experience that are assessed as described in Table 3 [9], [10], [11].

Table 2. SUS interpretation scores

Range of SUS Scores	Percentile	Grade	Interpretation
84.1–100	96–100	A+	Best Imaginable
80.8–84.0	90–95	A	Excellent
78.9–80.7	85–89	A-	Excellent
77.2–78.8	80–84	B+	Excellent
74.1–77.1	70–79	B	Excellent
72.6–74.0	65–69	B-	Excellent
71.1–72.5	60–64	C+	Good
65.0–71.0	41–59	C	Good
62.7–64.9	35–40	C-	Good
51.7–62.6	15–34	D	OK
25.1–51.6	2–14	F	Poor
0.0–25.1	0–1.9	F	Worst Imaginable

Table 3. Dimensions of UEQ

Dimensions	*Description*
Attractiveness	Represents the overall perception of the product. It assesses whether users find the product appealing or unappealing.
Perspicuity	Evaluates the ease with which users can become acquainted with the product and whether they can quickly learn to operate it.
Efficiency	Measures the extent to which users can accomplish their tasks with minimal effort and without unnecessary complications.
Dependability	Assesses the user's sense of control and reliability during interactions with the product.
Stimulation	Examines whether the product provides an engaging and motivating experience for users.
Novelty	Determines the product's degree of innovation and creativity, as well as its ability to capture and sustain user interest.

Meanwhile, qualitative data obtained from open-ended questions are processed through an extraction process that involves identifying key themes as part of the analysis [12]. Furthermore, these themes are used to derive relevant design insights aimed at improving user interface performance. This process is conducted using a three-rater approach, ensuring that the raters are relevant to the research and understand the context of the research objectives to enhance the reliability and validity of the analysis results [13].

C. Result and Discussion

Data collection was conducted in two stages: first, to evaluate the usability and user experience of the contract data recording feature in the current Sakti application, and second, to measure the effectiveness of the prototype improvement design. In each stage, 23 respondents were selected based on [specific criteria, e.g., experience level, familiarity with the system, or role in the organization] to ensure the relevance and validity of the results.

The respondents represented diverse roles, including operational end-users who regularly use the system, developer users involved in the technical aspects of the application, Ministry of Finance civil service students serving as trainer users, and Sakti service help desk agents providing guidance and support. Each group had different levels of involvement in the operational process and management of the application, contributing unique perspectives to the evaluation.

Table 4 details the number of respondents in each role and their respective contributions to the study.

Table 4. Demographic distribution of respondents based on role

No.	Role Category	Number	Percentage
1.	Respondents from Operational Users	9 people	39.1%
2.	Respondents from Guidance Support Users (Help Desk)	6 people	26.1%
3.	Respondents from Training Users	4 people	17.4%
4.	Respondents from Development Users	4 people	17.4%

Meanwhile, the diagram in Figure 4 presents this distribution in visual form to provide a clearer picture of the proportion of each group in the study.

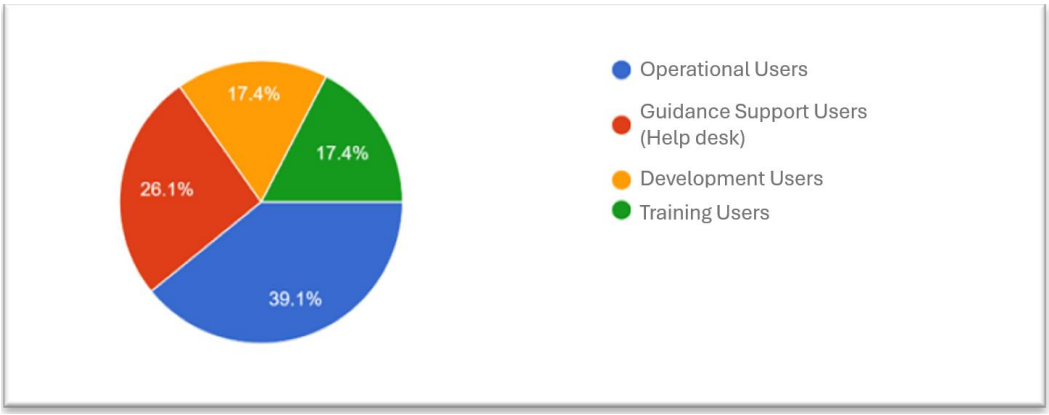

Figure4. Respondent engagement diagram based on role

Through Figure 4, it can be seen that the respondents in this study have different backgrounds. This aims to help ensure that the data collected reflects the perspectives of various relevant parties, thus providing more comprehensive and accurate results for both the first stage evaluation of the current condition and the second stage for the prototype.

1. Analysis of Current Condition Evaluation Results

The analysis of the current condition evaluation was conducted to identify the level of usability and user experience in the contract data recording feature of the Sakti application. This evaluation involved four key methods: usability testing using task scenarios, the SUS questionnaire, the UEQ, and open-ended questions. These methods aimed to understand how well the contract data recording feature meets user needs, identify potential problems encountered, and evaluate user perceptions of the application's interface.

First, usability testing was conducted using 12 scenarios divided into four scenario groups: recording (R1-R7), editing (U1-U2), deleting (H1), and drafting contract (D1-D2). The distribution and mapping of scenario completion processes are detailed in Table 5. The usability testing revealed 15 issues identified by respondents during task execution, which are summarized in Table 6. These issues ranged from navigation inefficiencies to unclear interface elements, significantly impacting task completion time and user satisfaction.

Table 5. Problems mapping matrix: stage 1

Respondents	Completion Task											
	R1	R2	R3	R4	R5	R6	R7	D1	D2	U1	U2	H1
RPD-01												
RPD-02												
RPD-03												
RPD-04												
RPD-05												
RPD-06												
RPD-07												
RPD-08												
RPD-09												
RPD-10												
RPD-11												
RPD-12												
RPD-13												
RPD-14												
RPD-15												
RPD-16												
RPD-17												
RPD-18												
RPD-19												
RPD-20												
RPD-21												
RPD-22												
RPD-23												
Problems Frequency	2	3	10	11	3	18	23	8	7	3	4	5
Percentage	8.7	13	43.5	47.8	13	78.2	100	34.8	30.4	13	17.4	21.7

Tasks successfully executed
Tasks run with notes/problems

The distribution of identified issues from usability testing, as detailed in Table 5, shows varying impacts on user interactions, categorized into four severity levels in Table 6 [14]. Low severity issues appeared in ≤10% of sessions, middle severity in 11%–50%, high severity in 51%–89%, and very high severity in ≥90%. The most critical issue was found in task R7, where all respondents had difficulty viewing the overall progress of the contract data recording process, making it a very high severity issue that requires immediate attention. This classification helps prioritize improvements to the most impactful usability problems.

Table 6. Summary of grouping of task problems: stage 1

Level	Status	Frequency Range	Tasks
1	Low	≤10%	R1
2	Middle	11%–50%	R2, R5, U1, U2, H1, D1, D2, R3, R4
3	High	51%–89%	R6
4	Vert High	≥90%	R7

Second, the SUS surveys comprised 10 questions answered by all respondents. After calculating the SUS scores, the current usability score was 67.39, which corresponds to a grade of C. This score indicates that the usability of the contract data recording feature is average but requires improvement to achieve a higher

level of user satisfaction and system efficiency. The detailed score interpretation is presented in Table 7.

Table 7. SUS calculation value: stage 1

Respondents	Calculation result value per question											Final Scores
	1	2	3	4	5	6	7	8	9	10	Total	(Total*2,5)
RPD-01	3	4	3	4	3	3	3	3	3	1	30	75
RPD-02	4	3	4	3	3	3	2	3	1	0	19	47,5
RPD-03	4	4	4	4	4	4	4	4	4	4	40	100
RPD-04	4	4	4	4	4	4	4	4	4	4	40	100
RPD-05	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-06	4	4	4	4	4	4	4	4	4	4	38	95
RPD-07	4	4	4	4	4	4	4	4	4	4	36	90
RPD-08	3	3	3	4	4	3	4	4	3	3	25	62,5
RPD-09	4	3	4	4	4	4	3	4	4	3	26	65
RPD-10	4	4	3	4	4	4	3	3	3	4	30	75
RPD-11	3	3	3	3	4	3	4	4	4	4	20	50
RPD-12	4	4	4	3	3	4	4	3	4	3	29	72,5
RPD-13	3	4	3	4	4	4	4	4	3	3	29	72,5
RPD-14	4	4	4	4	4	4	4	4	4	4	37	92,5
RPD-15	3	4	3	4	3	4	4	4	4	4	34	85
RPD-16	4	3	3	3	4	3	3	3	4	4	26	65
RPD-17	4	4	4	4	4	3	4	4	3	4	34	85
RPD-18	3	3	3	4	3	4	3	4	4	3	27	67,5
RPD-19	4	3	3	3	4	3	3	4	3	3	23	57,5
RPD-20	4	4	4	4	3	3	4	4	4	3	34	85
RPD-21	4	3	4	3	3	3	3	3	3	3	21	52,5
RPD-22	3	4	3	4	4	4	4	4	4	4	33	82,5
RPD-23	4	4	4	4	4	3	4	4	4	4	37	92,5
										Average Score		67.39

Third, the UEQ included 26 questions covering six dimensions: attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty. Results showed that the attractiveness dimension scored the lowest at 1.13, falling below the average benchmark, as detailed in Table 8. This finding highlights the need to enhance the visual appeal and overall aesthetic quality of the interface.

Table 8. Average value of UEQ scale index

No.	Identity	*Mean*	*Comparisson to Benchmark*
1.	Attractiveness	1.13	Below Average
2.	Perspicuity	1.21	Above Average
3.	Efficiency	1.26	Above Average
4.	Dependability	1.70	Good
5.	Stimulation	1.47	Good
6.	Novelty	1.22	Good

The UEQ results presented in Table 8 are further illustrated in the accompanying graphical representation in Figure 5, highlighting the comparative scores across all six dimensions. From the visualization, it is evident that the attractiveness dimension received the lowest rating, scoring 1.13, which falls below the average benchmark. This indicates that users perceive the system's visual appeal and overall aesthetic quality as suboptimal. Given its significant

impact on user experience, attractiveness was identified as a key focus for further investigation in this study, guiding the development of design improvements aimed at enhancing the interface's overall usability and user satisfaction.

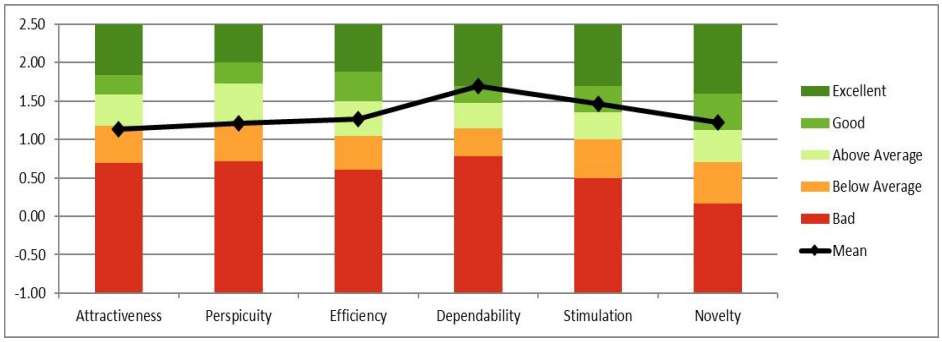

Figure5. UEQ dimensions score graph

Finally, qualitative insights were extracted from open-ended questions, focusing on users' difficulties, suggestions for improvement, and overall experience with the contract data recording feature in Sakti. Key issues included interface complexity and usability challenges. Suggestions for improvement emphasized simplifying the process and enhancing the interface. Thematic analysis, assisted by three raters, generated 12 design insights, leading to actionable recommendations for improving user satisfaction. The results are presented in Table 9.

Table 9. Design insights consensus list

Code	Issues (Consensus)	Design Insight
DI-1	Application performance drops when traffic increases	Optimize servers with auto-scaling and cache to handle load spikes.
DI-2	Poor mobile device display	Use responsive design and simplify UI to be mobile-friendly.
DI-3	Layered form pages are confusing when filling in contract data	Improve the filling sequence according to the business process to be more intuitive and efficient.
DI-4	Too many recording forms	Combine related forms and simplify recording
DI-5	No guidance or hints	Add tooltips or wizards to guide users through the filling process.
DI-6	No mandatory marks on fields.	Use the (*) symbol on mandatory labels, with additional legends for explanation.
DI-7	Input in many forms	Combine forms and use auto-fill or default values to simplify the input process.
DI-8	Forms are too detailed and complicated	Simplify the form by combining related fields and removing irrelevant fields.
DI-9	The recording form display is very dense and the layout is messy	Arrange the layout of each field and simplify the filling.
DI-10	Addendums are too complex	Create addendum templates and add a duplicate option to reduce manual filling.
DI-11	Char of Account (COA) recording is inefficient	Simplify COA selection steps, apply simple filter method
DI-12	Cannot see recording progress and resume in helicopter view	Simplify the filling and Combine forms into one-page view

The analysis of the four methods provided comprehensive insights into the current state of the contract data recording feature. Table 10 summarizes the key findings from each evaluation method, including identified usability issues, SUS scores, UEQ results, and qualitative feedback. Overall, the results indicate that while the system meets basic usability standards, significant improvements are required in attractiveness, ease of use, and addressing identified issues to enhance the overall user experience.

Table 10. Summary of overall evaluation results: stage 1

No.	Methods	Indicators	Findings	Summary
1.	Usability testing	Task scenario completion level	The frequency range of problems is at a moderate level (9 out of 12 scenarios are run with constraints/input from respondents). There is 1 scenario with a high scale (100% of respondents experience problems).	The contract data recording feature in the Sakti application shows less than optimal usability performance, so significant improvements are needed in the design and efficiency of the feature.
2.	SUS	Average SUS Score	Score 67.39 with Grade C. (Below average)	
3.	UEQ	UEQ index	The lowest index was found in the Attractiveness dimension which has an index of 1.13 with Below Average status.	
4.	Open-ended question	Feedback themes	A total of 12 problem consensuses were obtained which were classified into six categories of usability problems.	

2. Designing Interface Improvement Prototypes

After obtaining the list of issues from the open-ended questions, the integration stage was conducted by combining the findings with input from usability testing using a heuristic evaluation approach. This principle was used to analyze issues based on interface design frameworks such as visibility of system status, consistency and standards, and user control and freedom. The grouping was carried out by merging findings with similar patterns or meanings, resulting in a focused and structured list of issues (code: PHE), as presented in Table 11. Issues that were deemed irrelevant or did not significantly impact usability were eliminated during the mapping process to ensure that only critical and actionable problems were considered for further analysis and design improvements.

Tabel 11. Problem-solution mapping based on heuristic evaluation principles

Issue Codes	Problem Codes	Problem Description	Heuristic Evaluation Principle Categories
PHE-01	DI-3	Layered form pages make it confusing to fill in data.	*Recognition Rather Than Recall*
PHE-02	DI-4	Too many recording forms.	*Aesthetic and Minimalist Design*
PHE-03	DI-5	There is no guide or hint, there is no link/information on how to record.	*Help and Documentation*
PHE-04	DI-6	There is no mandatory mark on the field, it cannot be identified which	*Help Users Recognize, Diagnose, and Recover From Errors*

Issue Codes	Problem Codes	Problem Description	Heuristic Evaluation Principle Categories
		contract data is incomplete.	
PHE-05	DI-7	Input in multiple fields per form.	*Aesthetic and Minimalist Design*
PHE-06	DI-8	Form is too detailed and complex.	*Aesthetic and Minimalist Design*
PHE-07	DI-9	The recording form layout is very dense and the layout is not neat.	*Aesthetic and Minimalist Design*
PHE-08	DI-11	COA recording is not efficient.	*Flexibility and Efficiency of Use*
PHE-09	DI-12	Cannot see the recording progress and resume in helicopter view.	*Visibility of System Status*

Based on the integrated list of issues presented in Table 11, the final result was a list of issues coded with the PHE group code. After identifying the issues, further analysis was conducted by formulating interface recommendations based on Shneiderman's eight golden rules for interface design. To complement and enrich the improvement solutions to be made, the list of recommended improvements (code: SSR) was also derived from the design insights generated through the analysis of open-ended question responses presented in Table 12. This ensures that the proposed solutions are not only based on theory but also relevant to users' needs and experiences.

Tabel 12. Problem-solution mapping based on Shneiderman's eight golden rules of interface design

Solution Codes	Issue Codes	Recommendations	Shneiderman's Eight Golden Rules
SSR-01	PHE-01	Combine related forms into one screen or use a wizard flow to make navigation easier.	Strive for Consistency
SSR-02	PHE-02	Remove irrelevant forms or combine similar fields to reduce user burden.	Strive for consistency
SSR-03	PHE-03	Add tooltips, hyperlinks, or help icons to provide step-by-step guidance.	Offer informative feedback
SSR-04	PHE-04	Add visual indicators like an asterisk (*) for mandatory fields and highlight incomplete data.	Design dialog to yield closure
SSR-05	PHE-05	Provide templates or default inputs to speed up the process of filling in data on repetitive forms.	Enable frequent users to use shortcuts
SSR-06	PHE-06	Break down forms into smaller sections with only the essential fields.	Strive for Consistency
SSR-07	PHE-07	Use a grid-based design to streamline the layout of elements on the form.	Strive for consistency
SSR-08	PHE-08	Add search, filter, or dropdown features to make COA recording easier.	Permit easy reversal of actions
SSR-09	PHE-09	Provide a dashboard or summary view feature that displays work progress in a concise manner.	Reduce short-term memory load
SSR-09	PHE-09	Provide a dashboard or summary view feature that displays work progress in a concise manner.	Reduce short-term memory load

This table presents a detailed mapping of the usability issues identified with specific solutions, categorized by scenarios tested during the usability evaluation.

The solutions focused on improving the workflow and interface design for the process of recording, changing, deleting, and drafting contract data.

After the development of Table 11 and Table 12, a prototype was created that summarized all the findings from each scenario run in the usability testing. The interface before the improvements is presented in Figure 6, which illustrates the challenges and inefficiencies that existed.

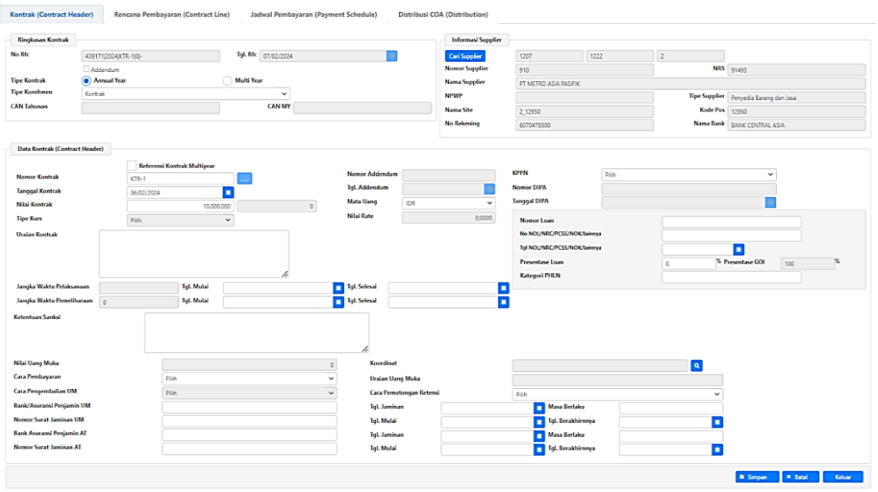

Figure6. Contract data recording feature interface (as is)

A prototype of the revised interface, which addresses the identified issues, is shown in Figure 7. This improved design is aligned with usability principles to improve user experience and operational efficiency.

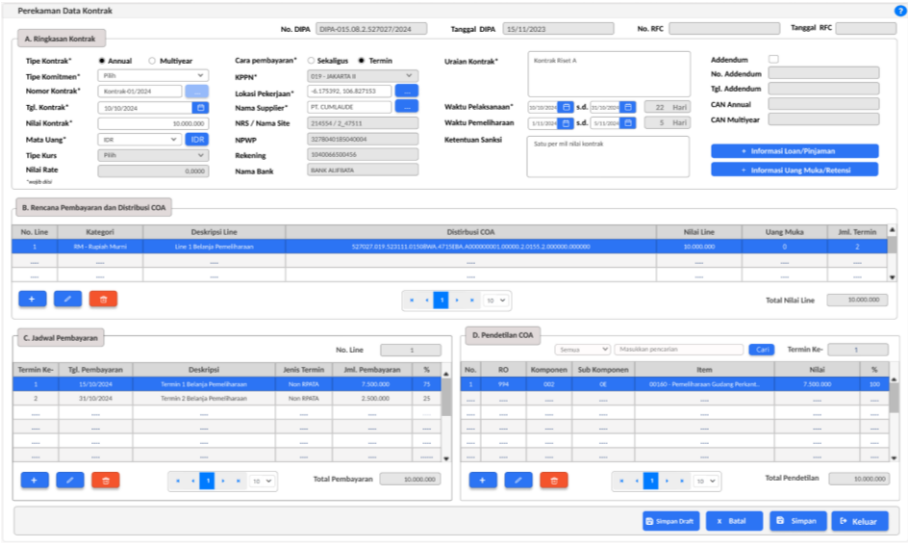

Figure7. Contract data recording feature interface (prototype)

This prototype integrates all recommendations, including more intuitive navigation, simplified workflows, and improved visual clarity. A key enhancement in this prototype is the ability to provide users with a comprehensive progress overview (helicopter view) of data entry within a single interface. Previously, the system used a layered tab structure, which restricted users from viewing their

progress holistically. This iterative process is carried out to ensure that the improvements meet user expectations and address the root causes of usability issues.

The results of this prototype will then be further analyzed to understand respondents' impressions through prototype evaluation. This evaluation aims to measure the usability and user experience of the improved interface to ensure the effectiveness of the implemented solution.

3. Analysis of Prototype Evaluation Results

The analysis of the prototype condition evaluation results was carried out to identify the level of usability of the prototype resulting from the improvement of the contract data recording feature in the Sakti application. This evaluation, considered stage 2, involved three usability testing methods: task scenarios, filling out the SUS questionnaire, and open-ended questions.

The mechanism used in usability testing at the prototype evaluation stage is the same as the first stage for evaluating current conditions. There are 12 scenarios divided into 4 groups, namely scenarios for recording, changing, deleting, and drafting contracts. The distribution of the mapping of the scenario work process by respondents is explained in detail in Table 13.

Table 13. Problems mapping matrix: stage 2

Respondents	Completion Task											
	R1	R2	R3	R4	R5	R6	R7	D1	D2	U1	U2	H1
RPD-01												
RPD-02												
RPD-03												
RPD-04												
RPD-05												
RPD-06												
RPD-07												
RPD-08												
RPD-09												
RPD-10												
RPD-11												
RPD-12												
RPD-13												
RPD-14												
RPD-15												
RPD-16												
RPD-17												
RPD-18												
RPD-19												
RPD-20												
RPD-21												
RPD-22												
RPD-23												
Problems Frequency	0	0	2	2	2	1	3	3	4	1	2	0
Percentage	0	0	8.7	8.7	8.7	4.3	13	13	17.4	4.3	8.7	0

Tasks successfully executed
Tasks run with notes/problems

The results of the prototype testing showed that most of the obstacles faced were at a low to moderate level, with several minor obstacles that still need attention to improve optimal support for users. These findings are summarized in Table 14.

Table 14. Summary of grouping of task problems: stage 2

Level	Status	Frequency Range	Tasks
1	Low	≤10%	R4, R5, R6, U1, U2, D1
2	Middle	11%–50%	R3, R7, D2
3	High	51%–89%	-
4	Vert High	≥90%	-

Based on the 10 SUS questions answered by all respondents, the SUS score was calculated for the prototype. The results showed that the prototype achieved a score of 84.35, which is included in Grade A+, with the status of "Best Imaginable". This reflects that the prototype design significantly improves the level of usability compared to the current condition. Details of the SUS results are further explained in Table 15.

Table 15. SUS calculation value: stage 2

Respondents	Calculation result value per question											Final Scores
	1	2	3	4	5	6	7	8	9	10	Total	(Total*2,5)
RPD-01	4	4	4	4	4	4	4	4	4	3	39	97,5
RPD-02	4	4	4	4	4	4	4	4	4	4	40	100
RPD-03	4	4	4	4	4	4	4	4	4	4	40	100
RPD-04	4	4	4	4	4	4	4	4	4	4	40	100
RPD-05	3	3	3	3	3	3	3	3	3	3	23	57,5
RPD-06	4	4	4	4	4	4	4	4	4	4	40	100
RPD-07	4	4	4	4	4	4	4	4	4	4	40	100
RPD-08	4	4	4	4	4	4	4	4	4	4	40	100
RPD-09	4	4	4	4	4	4	4	4	4	4	40	100
RPD-10	4	4	4	4	4	4	4	4	4	4	40	100
RPD-11	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-12	4	4	4	4	4	4	4	4	4	4	40	100
RPD-13	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-14	4	4	4	4	4	4	4	4	4	4	40	100
RPD-15	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-16	4	4	4	4	4	4	4	4	4	4	40	100
RPD-17	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-18	4	4	4	4	4	4	4	4	4	4	40	100
RPD-19	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-20	4	4	4	4	4	4	4	4	4	4	40	100
RPD-21	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-22	4	4	4	4	4	4	4	4	4	4	39	97,5
RPD-23	3	3	3	3	3	3	3	3	3	3	28	70
											Average Score	84.35

The results of the open-ended questions were analyzed using thematic analysis involving three raters to gain design insights. From this process, the impression was that the majority of users found the prototype easy to use, efficient, and fast. However, some respondents required initial adjustments, encountered technical difficulties, or needed additional guidance. The findings from this analysis are detailed in Table 16.

Table 16. Respondents' impressions of prototype themes

No.	Themes	Respondents' Impressions (Open Codes)
1.	No issues found	No issues, No difficulties, No obstacles, The features are already displayed on one screen, No comments, No difficulties because the flow is very clear, No obstacles, just requires getting used to, The prototype version is simpler and almost without obstacles.
2.	Easy to use	Easy to use and attractive, Easy to use features even for new users, Easy to use and informative, Easy to use with one-page display, The filling flow is easier to understand than before, Practical and easier, Contract data recording is easier and simpler, Quite good experience, More user-friendly and efficient.
3.	Efficient and fast	Effective, efficient, and neat appearance, More efficient recording on the new interface, Positive experience and provides insight, Application helps in recording contract data, Simple flow and simpler appearance, Save Draft feature is very helpful, Better than previous experiments.
4.	Needs initial adjustment	Need to adapt to new interface, Need post-update adjustment due to significant changes, Need to get used to it, Need adjustment, Need adaptation at the beginning, Need adaptation at the beginning of use, easier after getting used to it.
5.	Lack of guidance or Info	Lack of information or guidance regarding the use of the menu, Lack of guidance or technical instructions in the menu, Ignorance about the columns/sections that must be filled in, Simple display raises doubts about the completeness of the data.
6.	Technical difficulties	Difficult to identify Line values because they are not listed in the document, Confusion when recording payment schedules, The difference between the "save draft" and "save" menus is confusing.
7.	Notes on display aspect	Display size is too small, Modern display and easier navigation, Simple display raises doubts about the completeness of the data, Large amounts of data are still easy to understand and coherent.

The results of the analysis of the three methods applied show that the prototype successfully overcomes most of the obstacles found in the evaluation of the current condition. A summary of the results of the analysis of usability testing, SUS, and open-ended questions is summarized in Table 17, which provides a comprehensive overview of the effectiveness of the prototype in improving user experience.

Table 17. Summary of overall evaluation results: stage 2

No.	Method	Indicator	Findings	Summary
1.	Usability testing	Task scenario completion level	Prototype testing showed that most of the obstacles were at a low to moderate level, with relatively minor obstacles that still require attention to improve optimal support for users.	Overall, the prototype performed very well with most users finding it easy to use and efficient, although there are still some minor issues that require improvement to improve the user experience.
2.	SUS	Average SUS score	Score 84.35 with Grade A+ (Best Imaginable Status).	
3.	Open-ended question	Feedback themes	The majority of users found the prototype easy to use, efficient, and fast, although some required initial adjustments, encountered technical difficulties, or needed additional guidance.	

The evaluation results showed that the prototype of the contract data recording feature interface improvement in the Sakti application successfully improved usability and user experience. The SUS score increased from 67.39 (Grade C) to 84.35 (Grade A+), proving the effectiveness of the UCD approach in improving interface quality. Thematic analysis of open-ended questions revealed that the prototype met user expectations regarding ease of navigation, time efficiency, and clarity of information, although there were some minor issues that required further improvement. These findings also confirmed that the application of principles such as "Shneiderman's eight golden rules of interface design" can improve intuitive and efficient interface design, contributing to the development of public information systems in the government sector.

D. Conclusion

This study evaluates the usability and user experience aspects of the contract data recording feature in the Sakti application. Key findings include interface complexity, the need to fill in a lot of data, and the lack of adequate guidance, which hinder user efficiency and convenience. As a solution, this study produced a design prototype based on UCD principles that offers a simpler, more efficient, and more intuitive interface. This prototype was designed with a focus on simplifying the process, optimizing navigation, and improving readability.

Evaluation of the prototype showed significant improvements in usability, including task completion efficiency and positive user perceptions. These results are supported by an increase in SUS scores, usability testing results, and open-ended question analysis. Redesigning the interface with a UCD approach significantly increases user satisfaction, provides a better user experience, and is expected to help support the organization's operational needs to be more optimal. These findings can be a valuable reference in the development of a government information system that is oriented towards user needs and digital transformation in the public sector.

However, this study has certain limitations. It focuses solely on one module of the Sakti application, the contract data recording feature, so the findings may not be fully applicable to other modules. Further testing is needed across different modules to ensure consistency and overall usability improvement in Sakti.

For broader implementation, similar studies should be conducted on various features within the government financial management system and other public sector applications. This would provide a more comprehensive understanding of challenges and solutions to enhance user experience at the organizational level. Future research could also expand the evaluation scope by involving users from diverse backgrounds and expertise to gain more varied and in-depth insights.

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F. References

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