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UI/UX Design for Web-Based System of Technical Complaint Logging and IT Team Performance Evaluation using Design Thinking Method at Bandung City Health Office

Endang Amalia[1*], Fauziah[2]

[1,2]*Information System, Faculty of Engineering, Widyatama University, Kota Bandung, Jawa Barat 40125, Indonesia.*

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ABSTRACT

The absence of a digitized system for recording technical complaints remains a significant challenge within the internal operations of the Bandung City Health Department. Currently, the IT team—tasked with resolving issues such as network interruptions, hardware malfunctions, software errors, and application-related problems—lacks a dedicated system for systematically logging and monitoring resolved complaints. This reliance on manual, undocumented procedures result in delays in issue resolution, inconsistent data records, and an inability to objectively assess team performance. Consequently, these shortcomings may impair the effectiveness of the IT team, hinder internal service efficiency, and obstruct data-informed decision-making processes. This study proposes the design of a UI/UX system for web-based technical complaint logging and IT team performance evaluation, employing the Design Thinking methodology, which encompasses five iterative phases: empathize, define, ideate, prototype, and test. In the testing phase, the usability of the developed prototype was assessed using the System Usability Scale (SUS), involving six participants—equivalent to the number of IT personnel at the Bandung City Health Department. The results yielded an average SUS score of 84.58, which is classified within the "Best Imaginable" category, indicating a high level of user acceptance and system usability. These findings suggest that the proposed solution effectively meets user needs and holds strong potential for implementation as a digital system to enhance the recording of technical complaints and the evaluation of IT team performance within the Bandung City Health department.

1. INTRODUCTION

The rapid advancement of information technology has become a critical component in the operational activities of both public agencies and private enterprises. Nearly all organizations now leverage digital

[1*] Corresponding author. *E-mail address*: endang.amalia@widyatama.ac.id
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platforms as tools for managing data. As technology continues to evolve in sophistication and modernity, information systems contribute significantly to improving data management efficiency, resulting in time and cost savings (Setiawan et al., 2023).

In the development of information systems, the implementation of effective UI/UX design is essential for establishing a structured and systematic platform for recording technical complaints and conducting performance evaluations, thereby contributing to the creation of a high-quality information system (Nurohman, 2024). The user interface defines the structural aspects of the system, encompassing user interactions such as issuing commands, inputting data, and accessing content. In contrast, user experience refers to the overall interaction between users and the system, playing a critical role in determining the system's overall effectiveness and user acceptance. At the Bandung City Health Office, the IT team is tasked with resolving various technical issues, including network disruptions, hardware malfunctions, software errors, and application-related problems. However, the current process for logging complaints remains manual and lacks proper documentation. The absence of an integrated system not only causes delays in issue resolution but also leads to inconsistencies in data and challenges in accurately assessing the IT team's performance. This situation threatens to degrade the quality of internal services, slow down operational workflows, and obstruct data-driven decision-making processes. If left unaddressed, the effectiveness of the IT team will continue to decline, potentially impacting the quality and responsiveness of public health services.

Therefore, it is essential to design a digital solution capable of systematically recording technical complaints while simultaneously supporting comprehensive, structured, and sustainable performance evaluations of the IT team. An appropriate approach for designing such a solution is the application of the Design Thinking methodology to develop a user interface (UI) tailored for recording technical issues and assessing the performance of a web-based IT system (Agustina Nugrahani et al., 2023). Design Thinking is a problem-solving methodology that emphasizes user experience and needs, aimed at generating innovative and user-centered solutions (Herlina & Wahyuni, 2024). It involves an iterative design process that allows for continuous refinement and adaptation of the design to ensure it aligns with user requirements. This approach facilitates the exploration of diverse solution pathways and encourages creative problem-solving. The selection of this method is based on its ability to deliver a deep understanding of user needs, its flexibility in accommodating design revisions, and its capacity to generate multiple alternative solutions (Anastasya Priyani & Ratnasari, 2024). Furthermore, Design Thinking is particularly well-suited to addressing real-world challenges in this context—specifically, the need to develop a system that is user-focused, currently non-digitized, and lacking structural organization. In comparison, other methodologies such as User-Centered Design (UCD) and Human-Centered Design (HCD) also prioritize user experience but tend to offer less flexibility in problem exploration. On the other hand, approaches like Lean UX, Agile UX, and Goal-Directed Design are generally more applicable during the system development phase, especially when iterative product cycles are already established.

Recent studies have increasingly adopted user-centered design frameworks such as Design Thinking and User-Centered Design (UCD) to enhance user interface (UI) and user experience (UX) across digital applications. Research on the Traveliv tourism (Purnomo et al., 2024) application applied the five stages of Design Thinking to develop a user-friendly travel platform, achieving a System Usability Scale (SUS) score of 90, indicating excellent usability (Zamakhsyari & Fatwanto, 2023). A systematic literature review following the Kitchenham method analyzed 39 studies and confirmed the widespread use of Design Thinking, though without a standardized methodology (Addany et al., 2022). In financial technology, an e-wallet study applied Design Thinking to create a user-oriented digital payment prototype, while the Ngetikapaja startup website was developed using the same approach, with usability tests confirming its effectiveness (Yudhanto et al., 2022). Similarly, the Mentor On Demand (MOD) platform for online education achieved high user satisfaction with a Single Ease Question (SEQ) score of 6.2, and an AI-driven mobile learning application scored 73.33% on the SUS scale (Asaddulloh et al., 2023). Collectively, these

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studies affirm the effectiveness of iterative, user-centered approaches in improving usability and user satisfaction across diverse digital domains.

While previous studies have applied Design Thinking to various domains such as education, finance, and digital services, limited research has focused on its implementation within the public health sector, particularly for managing technical complaints and evaluating IT team performance. Existing systems in public institutions, including the Bandung City Health Office, still rely on manual processes that hinder efficiency, consistency, and data-driven evaluations. Therefore, this study addresses the gap by developing a user-centered, web-based system using the Design Thinking approach to enhance complaint documentation and performance assessment within government IT operations.

To ensure that the designed system aligns with user needs and offers ease of use, a usability evaluation will be conducted using the System Usability Scale (SUS) method as the final stage of prototype assessment. The implementation of this system is expected to make the complaint documentation process more systematic and readily accessible to relevant stakeholders.

Based on the interviews conducted, there is a critical need for a technical complaint recording application within the Bandung City Health Office. The challenges identified extend beyond the documentation of complaint types, encompassing inconsistencies in recording the resolution process, unclear timelines for issue resolution, and the absence of comprehensive data to support the performance evaluation of team members. To address these issues, a solution is proposed in the form of a web-based system for recording technical complaints and evaluating the performance of the IT team. This system aims to facilitate the efficient logging and management of complaint resolutions while providing accurate and structured data to support systematic performance evaluations. It is anticipated that the implementation of this system will enhance the efficiency of the complaint handling process, accelerate issue resolution, and simplify the evaluation of employee performance.

2. LITERATURE REVIEW

2.1 User interface

The user interface is a visual representation of a product, designed to be viewed and used by users. This interface includes elements such as colors, shapes, layouts, and other visual aspects. The User Interface (UI) comprises various components, including input fields, data and time, navigation, breadcrumbs, pagination, search fields, sliders *or* track bars, icons, carousel images, and informational elements. All of these components interact with the user based on the circumstances, needs, and required interface conditions (Agustina Nugrahani et al., 2023).

2.2 User experience

User experience refers to the impression formed when interacting with the system interface. This plays a crucial role in determining whether the information conveyed is sufficient and can be effectively received by the user (Ikhlas & Zukhri, 2022). User experience is an approach to product design that focuses on the user's perspective. User experience emphasizes the user's preferences, emotions, perceptions, and physical and psychological responses that occur before, during, and after using a product (Saputra & Kania, 2022).

2.3 Design thinking

Design thinking is a design approach that focuses on human needs to solve problems and produce innovative solutions (Dwi Wahyudi et al., 2022). This method has several stages, starting with gathering information about the user. After understanding their needs, the next step is to design a creative solution accordingly. The solution is then presented and tested to get feedback (Andiani & Wahyui, 2024).

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2.4 System usability scale

System Usability Scale (SUS) is a method commonly used to evaluate a system by measuring its usability level (Wahyuni & Hamzah, 2024). SUS is widely used in software, web applications, and hardware because it provides a fast and reliable measure of the user experience of a product (Oktavian et al., 2025).

3. METHODOLOGY

This study commences with the development of a conceptual framework that underpins its implementation. The following figure illustrates the sequence of activities encompassed within the research framework:

3.1 Literature review

The research process begins with a literature review to gain insights into design methodologies, particularly Design Thinking and the System Usability Scale (SUS).

3.2 Preliminary data collection (interviews and observations)

Initial data collection is conducted through observations and interviews with IT personnel at the Bandung City Health Department.

3.3 Data collection (empathize)

In the Empathize stage, further data is collected through interviews with prospective users, specifically the IT team. This process aims to explore problems, understand user feelings, and gain insights into user thought processes. The information obtained is then analysed using an empathy map—a user-centered tool designed to understand the user's perspective. The empathy map assists in identifying user needs, thereby enabling the design of user-friendly and experience-oriented solutions.

3.4 Problem and requirement analysis (define)

The Define stage focuses on understanding user perspectives and identifying their needs. Problem analysis is conducted to determine the root causes frequently encountered by potential users. This analysis utilizes an affinity diagram, a method for collecting and organizing data based on thematic similarities.

3.5 Solution ideation (ideate)

The Ideate stage involves generating ideas based on the results of the problem analysis. This process begins with the development of a User Flow and Wireframe as structured user experience solutions. The User Flow illustrates the steps users take within the system to achieve specific goals, while the Wireframe serves as a basic structural representation of the system interface.

3.6 User interface design (prototype)

The Prototype stage involves translating the solution ideas into a user interface design. At this stage, the previously developed Wireframes are transformed into high-fidelity prototypes to provide a more realistic user experience during testing. A high-fidelity prototype is a detailed and interactive representation of the final design, closely resembling the actual system.

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3.7 User interface testing using SUS (testing)

The final stage is Testing, conducted after the prototype has been developed, with the goal of gathering user feedback. The System Usability Scale (SUS) is employed to evaluate the system's usability based on user responses. Testing is conducted using Maze, an online testing tool that facilitates usability assessments. Through this process, researchers obtain a SUS score that reflects how effective, efficient, and user-friendly the developed interface is. Feedback from this stage is used to refine the design to better align with user needs.

4. LITERATURE REVIEW

4.1 Data collection (emphasize)

Based on the interviews conducted, several key issues were identified, which can be summarized as follows:

1. The absence of a dedicated system or technology for recording technical complaints and monitoring the performance evaluation of the IT team.
2. Delays in the complaint resolution process, leading to workload imbalances and overtasking.
3. Difficulties in monitoring and evaluating the performance of the IT team due to the lack of complaint resolution data.

These summarized findings will be further analyzed using an empathy map to assist in identifying user needs and informing the development of a user-centered solution.

4.1.1 Empathy Map

The Empathy Map is a visual tool used to gain a deeper understanding of user needs and experiences. It consists of four key elements: what the user says, thinks, feels, and does. This empathy map is constructed based on insights gathered through interviews. Fig. 1 below present the resulting empathy maps developed by Surya Cahyadi, Taufik Ismail, and Aufa Akhdan.

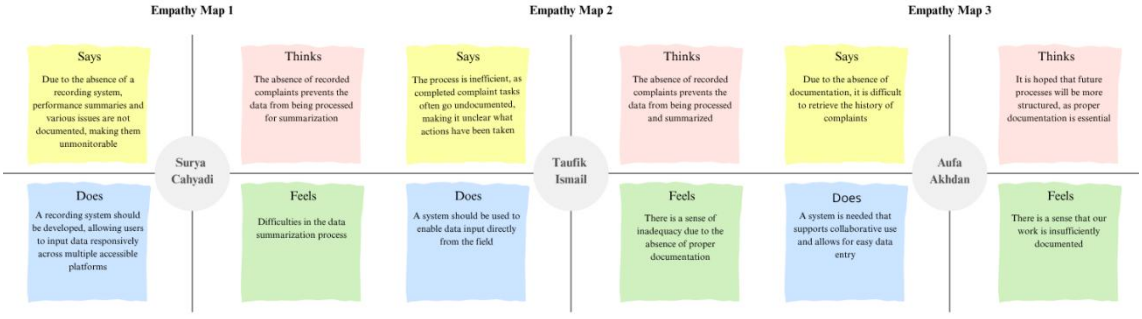

Fig. 1. Empathy map of Surya Cahyadi, Taufik Ismail and Aufa Akhdan

4.2 Problem and requirement analysis (define)

4.2.1 Affinity diagram

In this stage, the findings are categorized into four groups: the main problems, user needs, expectations of the system, and initial solution ideas, which are summarized in the Fig. 2 below:

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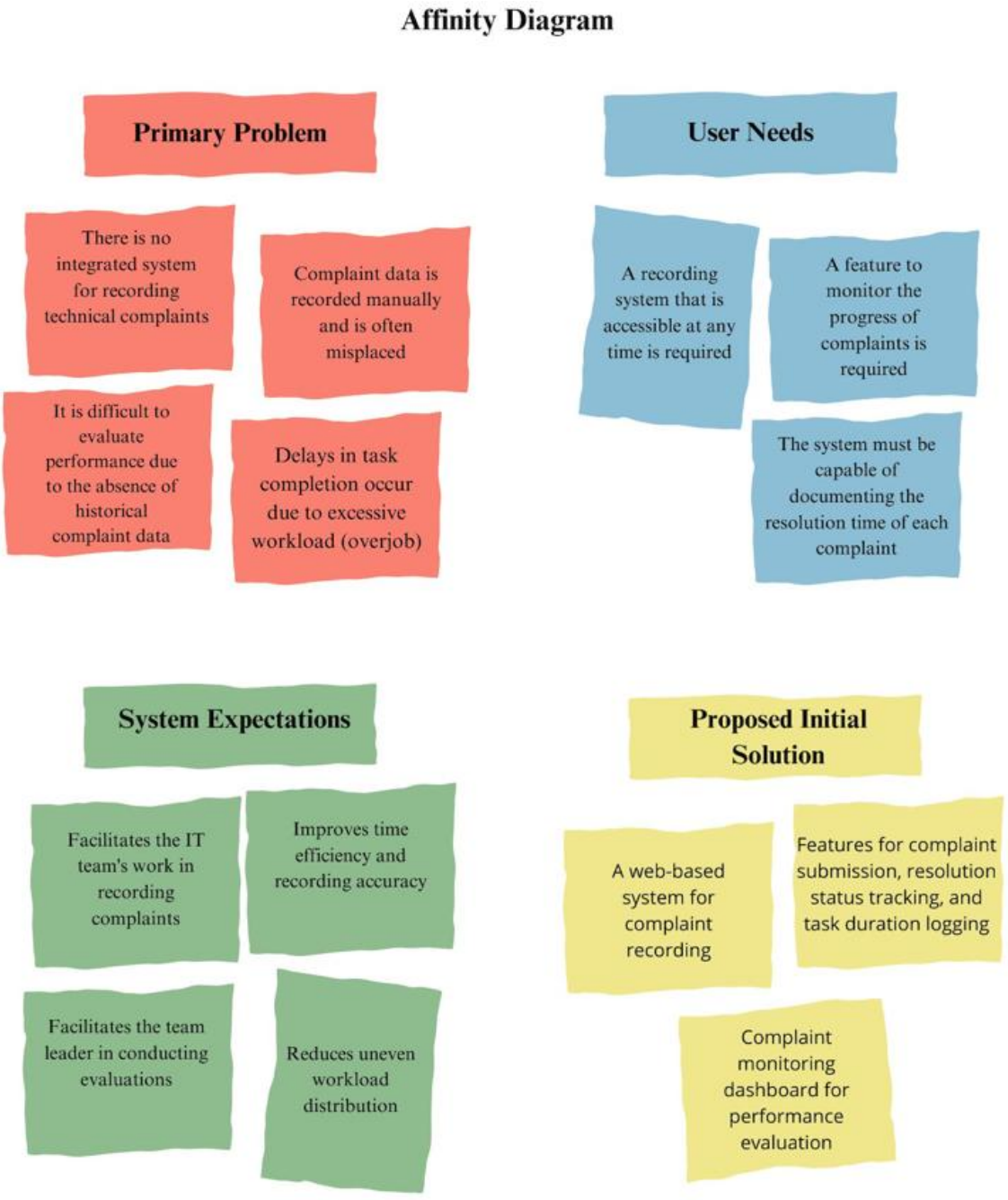

Fig. 2. Affinity diagram

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4.2.2 User persona

The development of the user persona is conducted after the affinity diagram has been established, with the aim of obtaining a clear representation of the prospective users' characteristics. The user persona serves to identify the user profile, goals, needs, and frustrations experienced by users, data which was gathered through interviews with prospective users, namely the IT team, during the Empathize stage. The resulting user persona is presented in the Fig. 3, 4 and 5 below:

Fig. 3. User persona of Surya Cahyadi

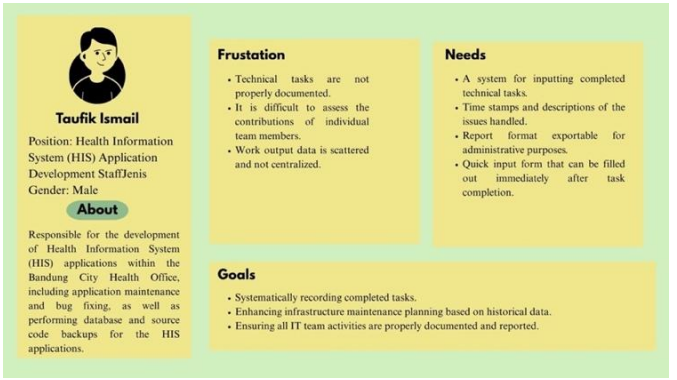

Fig. 4. User persona of Taufik Ismail

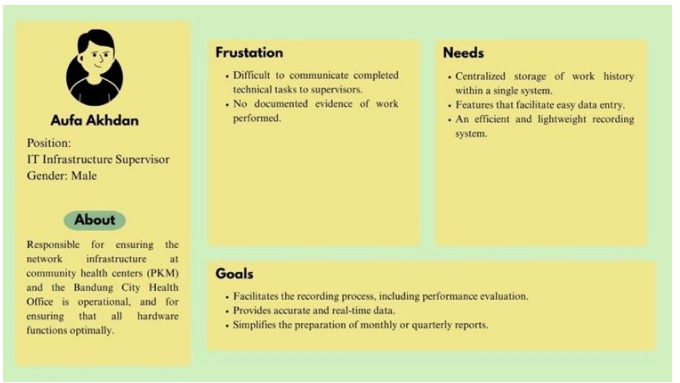

Fig. 5. User persona of Aufa Akhdan

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4.3 Solution ideation (ideate)

The Ideate stage is a phase dedicated to exploring creative solutions based on the problems previously identified. The primary objective is to generate a diverse set of design ideas, which will subsequently be selected and developed into a prototype. This stage involves several activities, including the creation of a user flow—illustrating the sequence of user interactions from the beginning to the end of system usage—and the design of a low-fidelity wireframe, which serves as an initial sketch of the system's interface.

4.3.1 Sitemap

A sitemap is a stage that describes the application framework. Fig. 6 is an overview of the information architecture of the designed system.

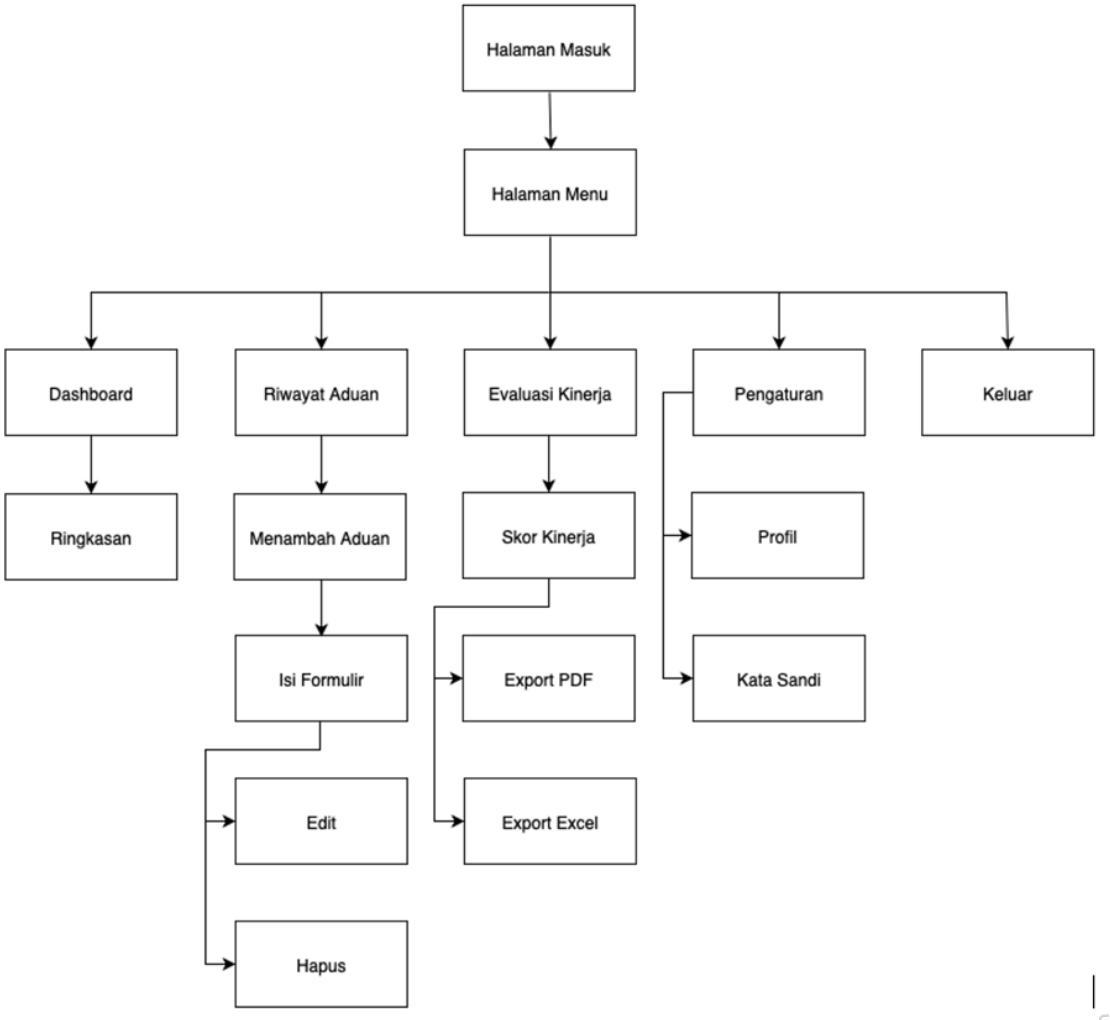

Fig. 6. Sitemap design

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4.3.2 User flow

Fig. 7 explains several user flows that have been developed, comprising dashboard, performance evaluation, and report creating page user flow:

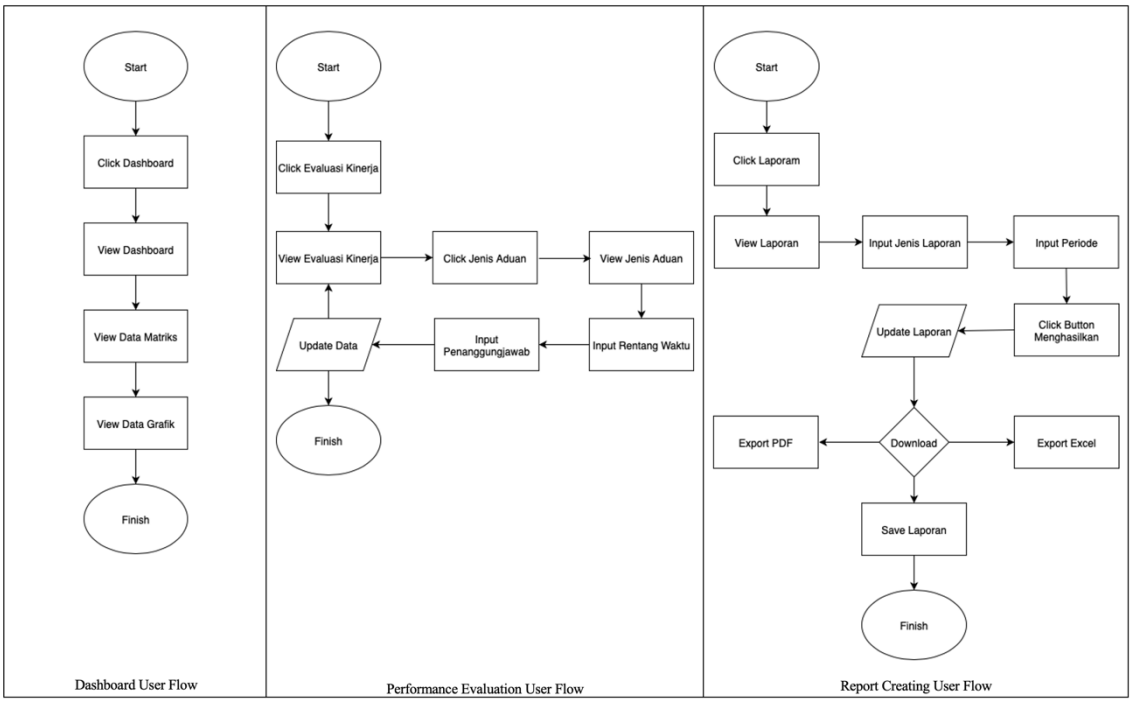

Fig. 7. User Flow of Comprising Dashboard, Performance Evaluation, and Report Creating Page

4.3.3 Sketch

A UI sketch is an initial description of the user interface created to represent a design idea before it is developed into a wireframe or prototype as described in Fig. 8 below.

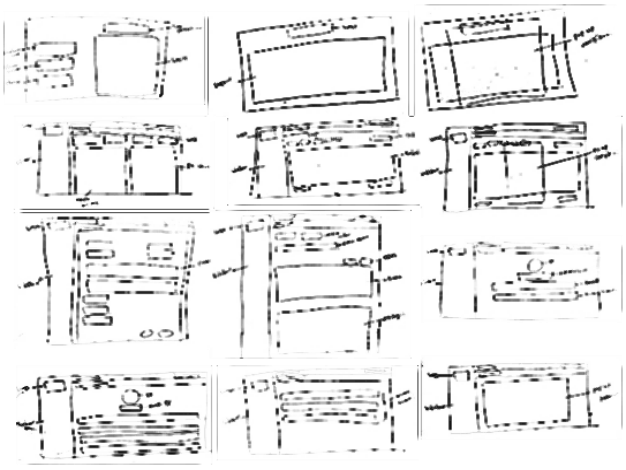

Fig. 8. Sketch of interface

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4.3.4 Wireframe

Wireframe is the basic framework of an initial product design, serving to visualize the layout, placement of elements, and interaction flows within the design. This stage is done after creating a user flow and generating a low-fidelity wireframe. Fig. 9 results of creating a low-fidelity wireframe. Here are the results of creating a low-fidelity wireframe:

Fig. 9. Wireframe interface

4.4 User interface design (prototype)

The Ideate stage is a phase dedicated to exploring creative solutions based on the problems previously identified. Fig. 10, 11, 12 and 13 are several prototypes designed for this system:

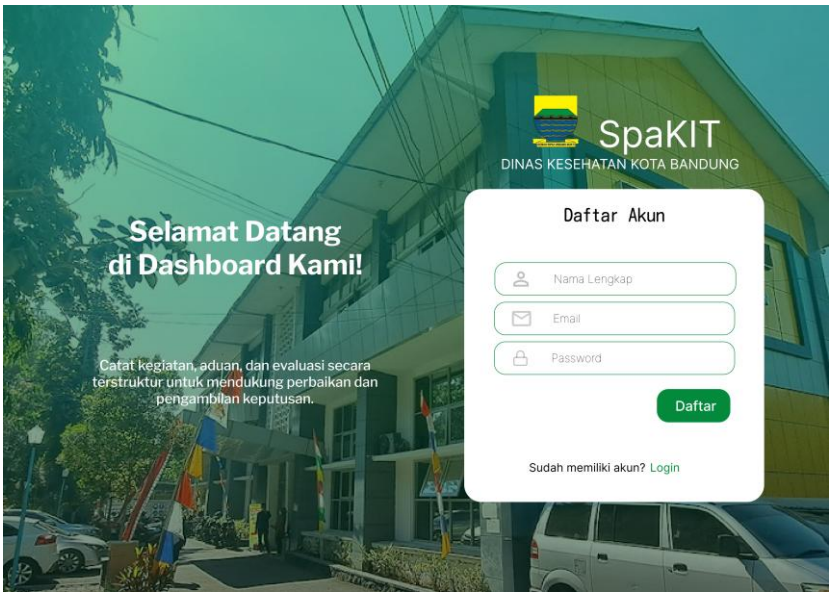

Fig. 10. User interface design of Dashboard

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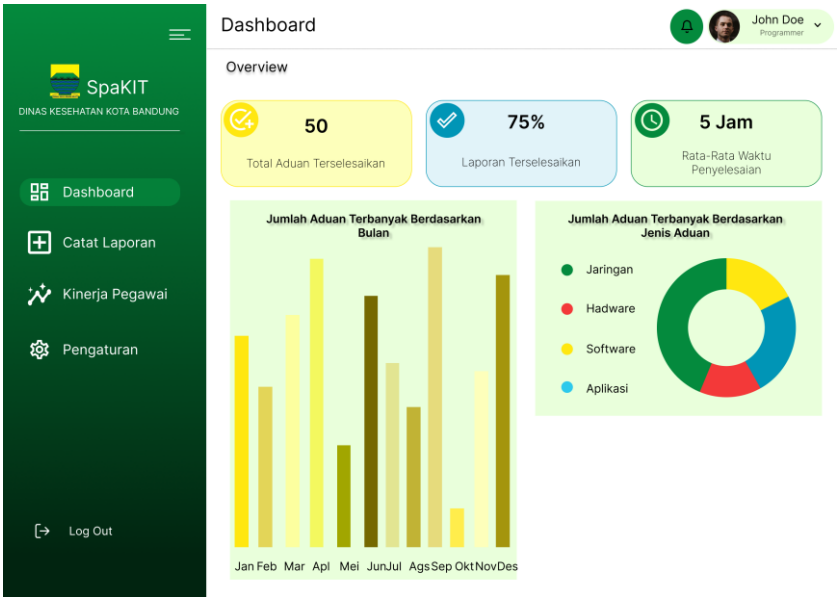

Fig. 11. User interface design of Catatan Laporan

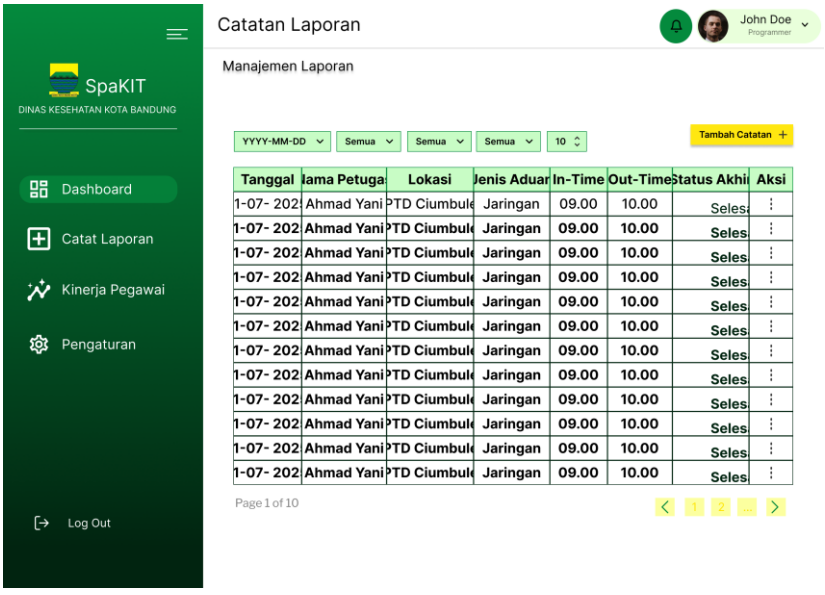

Fig. 12. User interface design of Tambah Catatan

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Fig. 13. User interface design of Bukti Penyelesaian Aduan

4.5 User interface testing using SUS (testing)

The final phase of the Design Thinking methodology is the testing stage. In this phase, the prototype of the proposed solution was evaluated by ten prospective users, comprising IT coordinators, programmers, and infrastructure specialists. The evaluation utilized the System Usability Scale (SUS) method and was conducted through an online testing platform using Maze.

4.5.1 System Usability scale score calculation

Usability testing using the SUS method is conducted to evaluate users' satisfaction with the system designed (Pratama, 2019) .During implementation, users will be asked to answer 10 questions related to their experience with the system. Each statement is answered using a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree.", the result describes as follow in Table 1.

Table 1. System usability scale (SUS) statement

No	Statement
1	I anticipate frequent use of this system.
2	I perceive the system as complex and challenging to operate.
3	I consider the system to be user-friendly and easy to navigate.
4	I believe I would require assistance from others to effectively use this system.
5	I find the system's features to be well-integrated and functionally cohesive.
6	I perceive inconsistencies within the system's design or functionality.
7	I believe most users will be able to learn how to use this system with minimal difficulty.
8	I find the system's interface or workflow to be confusing.
9	I feel confident and self-assured when operating this system.
10	I believe substantial learning is required before becoming proficient in using this system.

This section presents the results of usability testing conducted using the System Usability Scale (SUS) method. The results were obtained from a questionnaire that respondents completed after trying the

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prototype system. The SUS value is used to determine whether the system is easy to use and provides a good user experience in Table 2 and 3.

Table 2. Summary of usability results

Scenario	Success Rate	Average Duration	Misclick Rate	Note
List	100%	4.6 seconds	0%	The design proved to be optimal, as all participants were able to complete the process successfully without encountering any obstacles or making unintended interactions (misclicks)
Enter	100%	11.5 seconds	5.9%	The login process functioned properly; however, a minor misclicks occurred due to participants deviating from the intended navigation path.
Complaint History	100%	44.3 seconds	69.4%	The elevated number of misclicks can be attributed to unclear or confusing navigation on the complaint history form page.
Performance Evaluation	100%	5.0 seconds	0%	All participants were able to complete the tasks efficiently and without any unintended interactions (misclicks).
Setting	100%	6.6 seconds	11.1%	Certain areas remain susceptible to misclicks, primarily due to unclear icons or labels that are not easily understood by participants.
Out	100%	1.9 seconds	0%	The exit process was executed smoothly, with participants experiencing no difficulty in locating and utilizing the exit feature.

Table 3. Participant responses to the SUS questionnaire

No	RS	Raw Score									
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	R1	5	1	5	1	5	1	4	2	4	2
2	R2	4	2	4	4	4	4	5	2	4	4
3	R3	4	1	5	2	4	1	4	1	4	3
4	R4	5	1	5	1	4	2	4	1	5	1
5	R5	5	1	5	1	5	1	4	2	4	2
6	R6	5	1	5	1	5	1	4	2	4	2

Following the acquisition of the test results, the subsequent phase involves conducting a usability evaluation. The steps for calculating the System Usability Scale (SUS) score are outlined in Table 4 below.

Table 4. SUS score calculation result

No	RS	SUS Score Calculation Result										Total	Score (Total x 2.5)
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	R1	5	1	5	1	5	1	4	2	4	2	36	90
2	R2	4	2	4	4	4	4	5	2	4	4	24	62.5
3	R3	4	1	5	2	4	1	4	1	4	3	33	82.5
4	R4	5	1	5	1	4	2	4	1	5	1	37	92.5
5	R5	5	1	5	1	5	1	4	2	4	2	36	90
6	R6	5	1	5	1	5	1	4	2	4	2	36	90
Total													507.5
Average Score													84.58

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Fig. 14 presents the results of the SUS questionnaire calculation, conducted using the System Usability Scale Analysis Toolkit (sus.mixality.com), allowing for an objective assessment of the system's usability based on participant feedback.

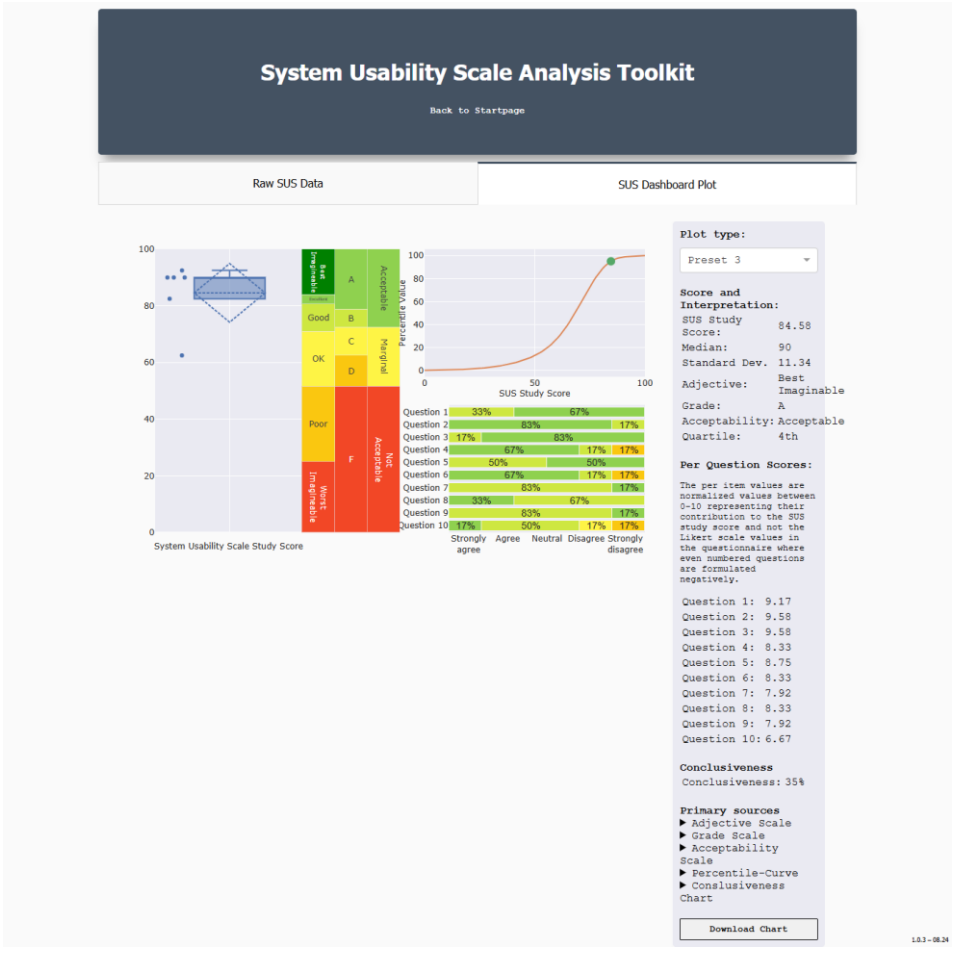

Fig. 14. System usability scale analysis toolkit

The figure above presents the results of the SpaKIT system's usability evaluation using the System Usability Scale (SUS) method. Based on responses from six participants, the system achieved an average SUS score of 84.58, placing it in the "Best Imaginable" category, corresponding to a grade of A and classified as having an acceptable level of usability. The median score was 90, with a standard deviation of 11.34, indicating that participant responses were relatively consistent and showed minimal variation from the central tendency.

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5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study, beginning with the Empathize stage, identifies key issues in recording the outcomes of technical complaints, particularly due to the absence of a system to track the resolution of disruptions related to networks, hardware, software, and applications. To address this gap, a UI/UX design was developed for recording technical complaints and evaluating IT team performance using the Design Thinking methodology, which consists of five iterative stages: Empathize, Define, Ideate, Prototype, and Test. This user-centered approach is applied systematically to understand user needs, accurately define problems, and develop effective design solutions.

The proposed system aims to streamline the process of documenting complaint outcomes and support IT coordinators in monitoring and evaluating team performance in a structured and data-driven manner. Following the development of the prototype, usability testing was conducted using the Maze online platform, with assessments based on the System Usability Scale (SUS). Six participants from the IT team of the Bandung City Health Department took part in the evaluation. The prototype achieved a usability score of 90 on the Maze platform and 84.58 based on calculations from sus.mexality.com, corresponding to a Grade A classification. These results indicate an excellent level of usability and demonstrate that the interface is well-accepted by users.

5.2 Recommendation

Although the designed prototype demonstrated promising usability outcomes, this study is limited to the design phase and does not encompass the functional development or implementation of the system. Therefore, it is recommended that the proposed design be utilized as a reference for future system development, enabling its practical application by the IT team within the Bandung City Health Department to facilitate more efficient recording, management, and evaluation of technical complaints. This system also holds potential as a strategic tool for enhancing internal performance in a sustainable manner. Furthermore, the author recommends conducting broader-scale system trials and continuous evaluations to ensure the system evolves in alignment with user needs, thereby enhancing the representativeness and effectiveness of its usability.

6. ACKNOWLEDGEMENTS/FUNDING

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7. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

8. AUTHORS' CONTRIBUTIONS

Endang Amalia: Conceptualization, supervision, writing, review and editing, and validation; **Fauziah:** Conceptualization, methodology, formal analysis, investigation, and writing original draft.

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