IAIC Transactions on Sustainable Digital Innovation (ITSDI)
Vol. 6, No. 1, October 2024, pp. 34∼50
E-ISSN: 2715-0461 P-ISSN: 2686-6285, DOI:10.34306

Optimizing User Interface of MBKM Information System Academic Services using Design Thinking Method (Case Study: Tadulako University)

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Article Info

Article history:

Submission September 18, 2024
Revised October 4, 2024
Accepted October 14, 2024
Published October 21, 2024

Keywords:

Merdeka Belajar - Kampus Merdeka (MBKM)
User Interface
Design Thinking

ABSTRACT

This study addresses the usability challenges faced by Tadulako University's MBKM & Academic Services Information System (SITAMPAN), developed in response to the Ministry of Education's Merdeka Belajar - Kampus Merdeka (MBKM) initiative. By applying a structured Design Thinking approach, this research seeks to present a novel solution for enhancing user experience and system usability in educational information systems. Through the System Usability Scale (SUS) and User Experience Questionnaire (UEQ) evaluations, initial findings indicated a low usability score (SUS: 41.75, grade "F"), categorizing the system as a "Detractor" in the Net Promoter Score (NPS) framework. Following the implementation of user centered design improvements, the SUS score increased substantially to 86.25 ("A" grade), with NPS shifting to a "Promoter" classification, while UEQ scores showed marked improvement across all metrics. This study demonstrates the effectiveness of Design Thinking in systematically addressing and optimizing the user experience, providing valuable insights for future information system developments in educational contexts.

DOI: https://doi.org/10.34306/itsdi.v6i1.676

1. INTRODUCTION

The Ministry of Education and Culture's Merdeka Belajar - Kampus Merdeka (MBKM) policy, introduced under Law Number 12 of 2012 and Permendikbud No. 3 of 2020, has redefined higher education objectives in Indonesia by encouraging universities to foster adaptable, interdisciplinary skills among students [1, 2]. Through MBKM, students are empowered to engage in learning activities beyond their primary academic disciplines for up to three semesters, promoting flexibility, practical experience, and alignment with industry demands [3]. Tadulako University (UNTAD) has responded to this policy by creating the Integrated Information System for MBKM & Academic Services, known as SITAMPAN, a digital platform designed to streamline data management, support academic guidance, and track off-campus student activities in real-time [4]. Despite its potential, early evaluations of SITAMPAN revealed several usability challenges that limit the system's effectiveness and user satisfaction. Feedback from users highlighted critical issues in the interface design, including a complex user flow, inconsistent visual elements, and a lack of intuitive navigation. Such issues can hinder users from fully benefiting from the system's intended features, underscoring the need for an interface improvement strategy that is both innovative and user-centered.

This study addresses these challenges by applying the Design Thinking methodology, which has proven effective in human-centered design and usability enhancement. While existing studies have explored the application of SUS and UEQ in measuring system usability and user experience, this research aims to provide a unique contribution by systematically implementing all five stages of Design Thinking Empathize, Define, Ideate, Prototype, and Test within the educational information system domain [5]. Through initial evaluations using the System Usability Scale (SUS) and User Experience Questionnaire (UEQ), the study identified significant usability limitations within SITAMPAN [6]. Following the Design Thinking-guided redesign, a second evaluation will measure the effectiveness of the improvements, providing evidence-based recommendations for future system developments [7].

The findings of this study have broader implications for educational institutions that seek to optimize their digital services and align them with user expectations. By presenting a structured approach to improving user experience in academic information systems, this research contributes to advancements in information systems design, especially within the educational context where user engagement and satisfaction are critical.

2. RESEARCH METHODS

This study employs the Design Thinking methodology, a user-centered approach to improve the usability and user experience of the MBKM & Academic Services Information System (SITAMPAN) at Tadulako University. Initial and final evaluations are conducted using the System Usability Scale (SUS) and User Experience Questionnaire (UEQ) to assess improvements after implementing design recommendations.

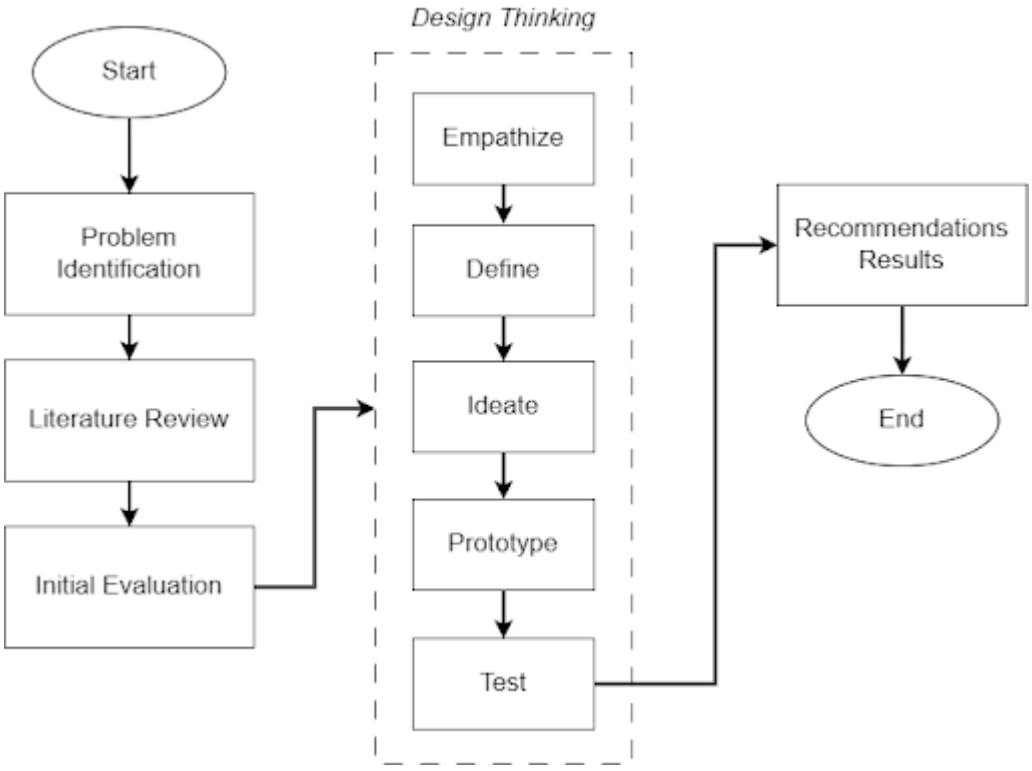

Figure 1. Flow of Research

The research process starts with an initial assessment of SITAMPAN to identify usability, functionality, and user experience issues. This assessment provides baseline data to inform recommendations for improvement. Based on these findings, the researcher develops specific design recommendations aimed at enhancing system usability and user satisfaction. After implementing these improvements, a final evaluation is conducted to compare the results of the initial and final assessments. This comparison allows the researcher to measure the effectiveness of the suggested changes. The stages of this process are outlined in the research phase overview in Figure 1.

The research methodology employed in this study follows a structured approach, centered around the principles of Design Thinking. This methodology consists of sequential stages aimed at addressing and improving the usability and user experience of SITAMPAN. Each stage is designed to systematically identify issues, gather insights, and apply evidence-based solutions, ensuring a comprehensive evaluation and enhancement of the system.

2.1. Problem Identification

The research began by identifying existing usability and interface issues in SITAMPAN through user interviews and direct observation. Identified challenges included complex navigation, inconsistent visual elements, and a lack of intuitive user flow [8]. These findings established the foundation for subsequent improvements.

2.2. Literature Review

This stage involved reviewing relevant literature on system usability, Design Thinking, SUS, and UEQ to establish a theoretical foundation. Resources included e-books, national and international journals, and relevant articles. This review informed the development of user-centered evaluation metrics and provided insight into similar studies that applied SUS and UEQ in educational systems [9].

2.3. Evaluation

The evaluation stage consists of two crucial phases: initial evaluation before making recommendations and final evaluation after implementing recommendations. In both phases, two assessment methods are utilized: The System Usability Scale (SUS) and the User Experience Questionnaire (UEQ), for assessing usability of the system and interface quality of SITAMPAN.

2.3.1. System Usability Scale (SUS)

The System Usability Scale (SUS) is a standard tool for assessing system usability from the user's perspective [10]. In this study, SUS is applied to evaluate the usability of SITAMPAN, focusing on aspects such as ease of use, required technical support, user confidence, and interface consistency [11]. The following table outlines the 10 questions used in the SUS questionnaire to gather these insights [12].

Table 1. SUS Question Items

No	Question Items
1	I believe that I would use SITAMPAN regularly.
2	I find SITAMPAN to be very complex.
3	In my opinion, SITAMPAN is straightforward to operate.
4	To operate SITAMPAN, I require support of a technician.
5	In my opinion, the integration of various functions in SITAMPAN appears to be good.
6	In my opinion, SITAMPAN exhibits too many inconsistencies or excessive incongruities.
7	I believe that most individuals will swiftly learn how to use SITAMPAN.
8	I find the use of SITAMPAN to be very confusing.
9	I feel confident using SITAMPAN.
10	It requires a lot of learning for me before I can become proficient in using SITAMPAN.

The results presented in Table 1 offer a thorough overview of SITAMPAN's usability from the perspective of its users. The responses indicate several key areas where improvements could be beneficial, particularly in addressing issues related to system complexity and the ease with which users can adapt to the platform. Some questions reveal challenges that may disrupt interaction or require extra support, indicating that simplifying certain functions could improve usability. These insights guide further development to ensure SITAMPAN better meets user needs and enhances overall satisfaction.

The calculation rule for SUS scores specifies that for each odd-numbered item, the participant's response score is increased by one, while for each even-numbered item, the score is subtracted from 5. After

tallying the scores of all participants, the combined total is then multiplied by a factor of 2.5 to produce the final SUS score. This score, ranging from 0 to 100, offers a standardized measure of usability. The Likert scale used in the questionnaire, as shown in Table 2, defines the range of responses for each item.

Table 2. Likert Scale

No	Answer Choices	Score
1	Strongly Disagree	1
2	Disagree	2
3	Neutral	3
4	Agree	4
5	Strongly Agree	5

The Likert scale in Table 2 lets participants rate their agreement, forming the basis for SUS scores. Averaging these responses provides a final usability score, reflecting SITAMPAN's effectiveness and user satisfaction.

The calculation rule for SUS scores states that for each odd-numbered item, the participant's response score is reduced by one, while for even-numbered items, the score is subtracted from 5. The overall SUS score is calculated by adding together the scores of all participants, and then this outcome is multiplied by a factor of 2.5 to determine its final score. The concluding score ranges from 0 to 100, determined by averaging each participant's scores using the defined equation (1).

$$\bar{X} = \frac{\sum x}{n} \tag{1}$$

2.3.2. User Experience Questionnaire (UEQ)

The User Experience Questionnaire (UEQ) is a method for evaluating a product's overall user experience, valued for its efficiency in processing data [13]. With 27 respondents, this sample size aligns with the UEQ Handbook's recommended range of 20-30 for reliable results [14]. The questionnaire includes 26 items across six dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty, with ratings from "bad" to "excellent" to assess user experience [15]. The UEQ instrument is shown in Figure 2 [16].

	1 ... 7		
annoying	○ ... ○	enjoyable	1
not understandable	○ ... ○	understandable	2
creative	○ ... ○	dull	3
easy to learn	○ ... ○	difficult to learn	4
valuable	○ ... ○	inferior	5
boring	○ ... ○	exciting	6
not interesting	○ ... ○	interesting	7
unpredictable	○ ... ○	predictable	8
fast	○ ... ○	slow	9
inventive	○ ... ○	conventional	10
obstructive	○ ... ○	supportive	11
good	○ ... ○	bad	12
complicated	○ ... ○	easy	13
unlikable	○ ... ○	pleasing	14
usual	○ ... ○	leading edge	15
unpleasant	○ ... ○	pleasant	16
secure	○ ... ○	not secure	17
motivating	○ ... ○	demotivating	18
meets expectations	○ ... ○	does not meet expectations	19
inefficient	○ ... ○	efficient	20
clear	○ ... ○	confusing	21
impractical	○ ... ○	practical	22
organized	○ ... ○	cluttered	23
attractive	○ ... ○	unattractive	24
friendly	○ ... ○	unfriendly	25
conservative	○ ... ○	innovative	26

Figure 2. UEQ Instrument

Figure 2 shows the UEQ instrument, which assesses user experience across 26 items on a 7-point scale with opposing descriptors. It covers six dimensions: attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. This tool captures users perceptions, highlighting areas of strength and potential improvement in the product's experience.

2.4. Design Thinking

Design Thinking is an intentional approach employed in design processes to uncover solutions to particular challenges, emphasizing user needs [17]. The Design Thinking method involves five steps, including the empathize, define, ideate, prototype, and testing stages [18].

In the first stage of employing Design Thinking, referred to as empathize, the objective is to develop a profound understanding of the challenges encountered and uncover suitable solutions [19]. This research is conducted with the intention of discovering and identifying issues that arise within SITAMPAN. Information is gathered through face-to-face interviews with several SITAMPAN users.

The subsequent stage is the define phase, which aims to carefully delineate the core of the issue by structuring all collected information. This process helps in clearly identifying user problems and needs [20]. In this step, user personas are created as representations or descriptions of the targeted users of the product [21]. In addition, user journey maps are used to describe the stages or steps that users take [22].

The next step is Ideate, which is the third stage where the process is conducted to generate various ideas or sketch solutions as a basis for prototype development [23]. In this stage, a low fidelity wireframe will be created as a basic framework for the system interface. The final step involves creating a mockup or high-fidelity visual design.

The next step is prototyping, where concepts are translated into a system model that can be tested. The goal is to identify potential issues before the system is introduced and implemented widely. Prototype development follows the design created in the ideation stage, considering user interactions with the system [24].

The final stage is testing, which aims to conduct trials and evaluations of the prototype of the product or system with a number of users. In this testing stage, there is still an opportunity to adjust the developed system to meet user needs and preferences [25]. The assessment will involve employing the System Usability Scale (SUS) and User Experience Questionnaire (UEQ).

3. RESULTS AND DISCUSSION

The results and discussion section presents the findings from the initial evaluation of SITAMPAN's user interface, conducted using the System Usability Scale (SUS) and User Experience Questionnaire (UEQ). This assessment provides insights into how well the current user interface meets user needs and expectations, highlighting areas for improvement in usability and user experience.

3.1. Preliminary Evaluation Results

In the initial stage, the assessment of the user interface of the Integrated Information System for MBKM & Academic Services at Universitas Tadulako (SITAMPAN) is conducted using two evaluations: the System Usability Scale (SUS) and the User Experience Questionnaire (UEQ) [26]. Such evaluations offer initial insights into how effectively the current user interface aligns with user needs and expectations.

3.1.1. Results of System Usability Scale (SUS) Testing

To evaluate the usability of the SITAMPAN user interface (UI), the System Usability Scale (SUS) method was applied, gathering feedback from a group of 10 participants. This method involves a standardized set of questions designed to assess various aspects of user interaction, ease of use, and overall satisfaction with the system. Each participant responded to 10 items within the SUS, covering factors such as perceived complexity, the need for technical support, and confidence in using the interface.

The results provide a quantitative measure of usability, offering valuable insights into the strengths and potential areas for improvement within the system. Table 3 below presents the specific responses of each participant to each of the 10 SUS items, forming a foundation for further analysis and discussion on SITAMPAN's usability.

Table 3. Responses of SUS Questionnaire Respondents

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R1	3	4	3	3	2	4	2	3	4	2
R2	3	3	4	4	4	4	3	3	3	3
R3	5	2	4	4	2	4	3	3	3	5
R4	3	2	4	2	3	5	3	3	4	4
R5	3	4	4	5	2	5	2	2	2	5
R6	3	4	4	4	4	5	5	5	4	3
R7	2	4	4	3	3	3	3	3	3	3
R8	4	5	5	5	4	4	3	3	3	5
R9	4	5	5	4	4	4	4	4	4	4
R10	5	5	4	2	4	4	4	4	4	2

Based on Table 3, the responses from 10 participants to the SUS questionnaire reflect varying levels of usability for the SITAMPAN interface. Scores range from 1 to 5, with higher scores indicating a more positive experience. This data helps identify both strengths and areas for improvement in the system's usability.

After collecting responses from all participants on the SUS questionnaire, the next step is to calculate the scores [27]. For odd-numbered questions, 1 is subtracted from each response, while for even-numbered questions, each response is subtracted from 5 [28]. The overall SUS score is then computed by summing all responses and scaling the result by 2.5 to obtain the final score, as shown in Table 4.

Table 4. Final Results of System Usability Scale

Respondent	Question										Total	SUS Score Value (Total x 2.5)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
R1	2	1	2	2	1	1	1	2	3	3	18	45
R2	2	3	1	3	1	2	2	3	2	3	21	52.5
R3	4	0	1	3	0	1	2	0	1	0	10	25
R4	3	4	0	3	1	2	3	2	2	5	25	62.5
R5	2	1	3	0	1	0	0	1	2	0	10	25
R6	2	1	2	3	3	1	4	2	3	3	14	35
R7	1	1	3	1	1	1	2	3	1	0	14	35
R8	3	1	0	1	1	0	1	1	1	0	9	22.5
R9	3	0	1	3	2	3	1	2	3	4	22	55
R10	4	0	3	3	3	1	3	1	3	3	24	60
Average SUS score												**41.75**

The average SUS score of 41.75, as shown in Table 4, indicates a moderate level of usability for SITAMPAN, suggesting there may be room for improvement in the system's design and functionality. The variability in scores among respondents also highlights differing user experiences, with some users finding the interface more challenging than others. This insight can help guide targeted enhancements to improve overall user satisfaction.

The evaluation using the SUS method indicates that the SITAMPAN UNTAD information system achieved an average score of 41.75. According to the SUS scale, this score is classified as low and falls into the "F" grade category. The adjective associated with this score is "Poor," indicating that a majority of users rated the usability of this system as poor. Additionally, in terms of acceptability, this score is categorized as "Not Acceptable", indicating that users perceive the system as not meeting their expectations regarding usability and overall experience as a user [29, 30].

Furthermore, in Net Promoter Score (NPS) measurement, this score places SITAMPAN in the "Detractor" category, indicating that many users are dissatisfied and are unlikely to recommend the system to others [31]. These results highlight the need for interface improvements, simplification of workflows, and additional training to enhance usability and user experience [32]. The interpretation of these findings is detailed in Figure 3.

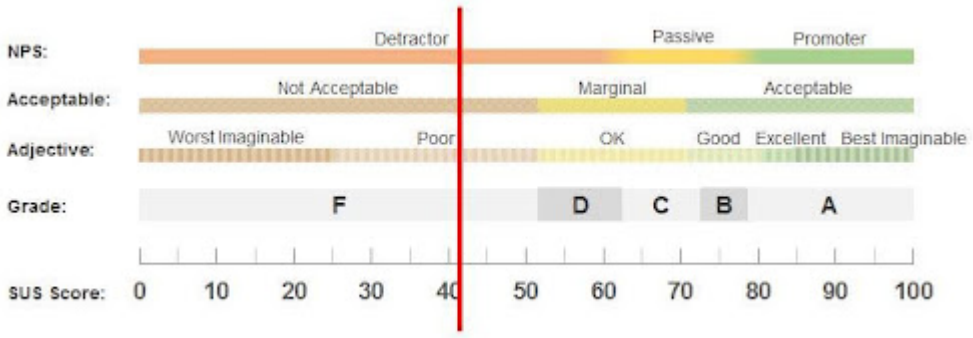

Figure 3. System Usability Scale (SUS) Rating Scale

Based on the analysis in Figure 3, SITAMPAN's SUS score falls within the "Detractor" category, rated as "Not Acceptable" indicating user dissatisfaction and a low likelihood of recommendation. This result highlights the need for usability improvements.

3.1.2. Results of User Experience Questionnaire (UEQ) Testing

During the testing phase conducted on the system, the UEQ method was employed by distributing questionnaires to 27 respondents through Google Forms [33]. Data collected from the UEQ questionnaire were analyzed using Excel's Data Analysis Tools. The outcomes from the UEQ survey processing after testing the prototype of the Integrated Information System for MBKM & Academic Services at Tadulako University (SITAMPAN) can be observed in Figure 4 and Table 5.

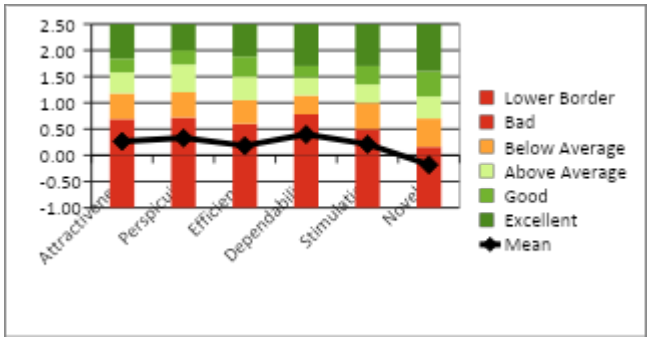

Figure 4. User Experience Questionnaire (UEQ) Rating Scale

As shown in Figure 4, the UEQ rating scale for SITAMPAN indicates that all six dimensions attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty are rated below average, with most falling into the "Bad" category. This distribution highlights a generally negative user experience, suggesting areas where the system may not be meeting user expectations.

Table 5. Results of UEQ Benchmark Evaluation

Scale	Mean	Comparison to Benchmark
Attractiveness	0.26	Bad
Perspicuity	0.33	Bad
Efficiency	0.18	Bad
Dependability	0.39	Bad
Stimulation	0.21	Bad
Novelty	-0.18	Bad

The evaluation using the UEQ method, as shown in Table 5, indicates that the SITAMPAN information system received low scores across all measured aspects. The Attractiveness aspect scored 0.26, categorized

as ”bad” indicating that users did not find the system appealing. Perspicuity scored 0.33, also ”bad” suggesting that the system is not easy to understand or use. Efficiency was rated 0.18 (”bad”), indicating that the system does not assist users in completing tasks quickly. Dependability scored 0.39 (”bad”), showing that users do not perceive the system as reliable. Stimulation received a score of 0.21 (”bad”), indicating that the system does not provide an enjoyable experience, and Novelty scored -0.18 (”bad”), meaning users perceive the system as lacking innovation. Overall, these results underscore the urgent need for improvements across various aspects to better meet the expectations and needs of SITAMPAN UNTAD users.

3.2. Design Thinking Recommendations

In efforts to enhance usability and the overall user experience with the Integrated Information System for MBKM & Academic Services at Tadulako University (SITAMPAN) through the adoption of a Design Thinking approach, the following are the outcomes and discussions achieved by applying the Design Thinking framework, which comprises five phases: Empathize, Define, Ideate, Prototype, and Test.

3.2.1. Empathize

In the Empathize stage, the approach is to deeply understand from the perspective of the target users. This stage begins with conducting in depth interviews with the target users. A total of 10 student users of SITAMPAN were involved in this study. The interview process was conducted to gather fresh insights and additional information concerning SITAMPAN's usability and user experience. After completing interviews, the next step is to organize each respondent's responses to facilitate the creation of an affinity map or affinity diagram. This method is utilized in user research to uncover various insights and emerging themes. The outcomes from the affinity diagram process for this study are displayed in Figure 5.

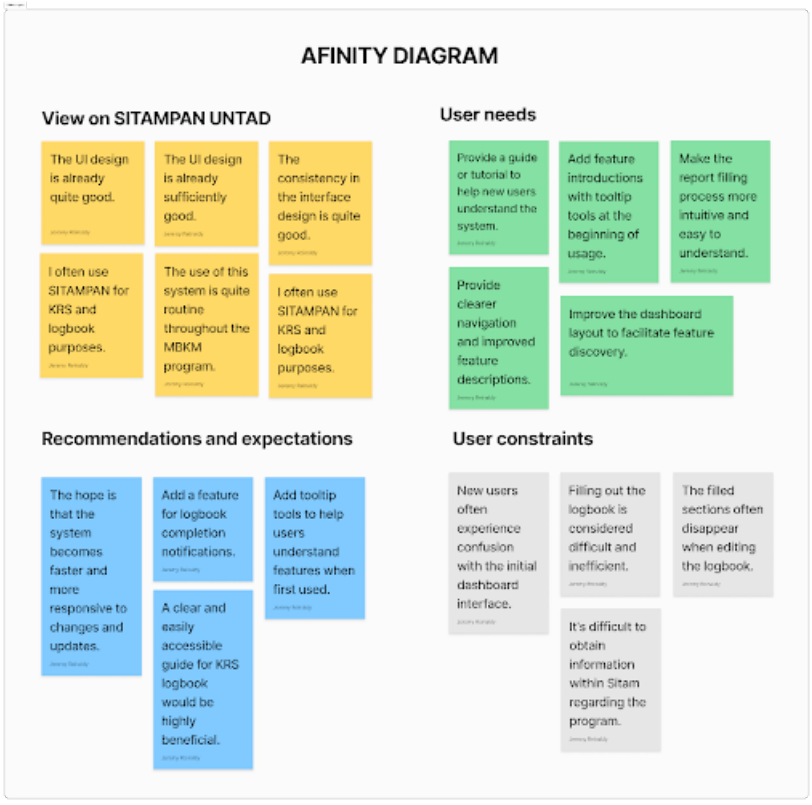

Figure 5. Affinity Diagram

As shown in Figure 5, the affinity diagram organizes key insights into views, needs, constraints, and recommendations, guiding improvements for SITAMPAN.

3.2.2. Define

The Define stage uses three key tools: User Persona, User Journey Map, and How Might We (HMW). User Persona captures user preferences and needs, User Journey Map identifies user requirements and pain points, and HMW generates ideas to improve SITAMPAN's interface based on user insights.

- **User Persona**
  The creation of these user personas serves as a representation of the target users of SITAMPAN. Through these personas, we can better understand the preferences and needs of users. Figure 6 illustrates the results of the personas that have been created.

- **User Journey Map**
  The User Journey Map helps understand the requirements of users and identify points of frustration during their interactions with the product. Figure 7 illustrates the outcomes of the prepared User Journey Map.

- **How Might We (HMW)**
  Formulating problems from the user's perspective to generate ideas in the interface design process, which are then realized in the form of How Might We statements, can be found in Figure 8.

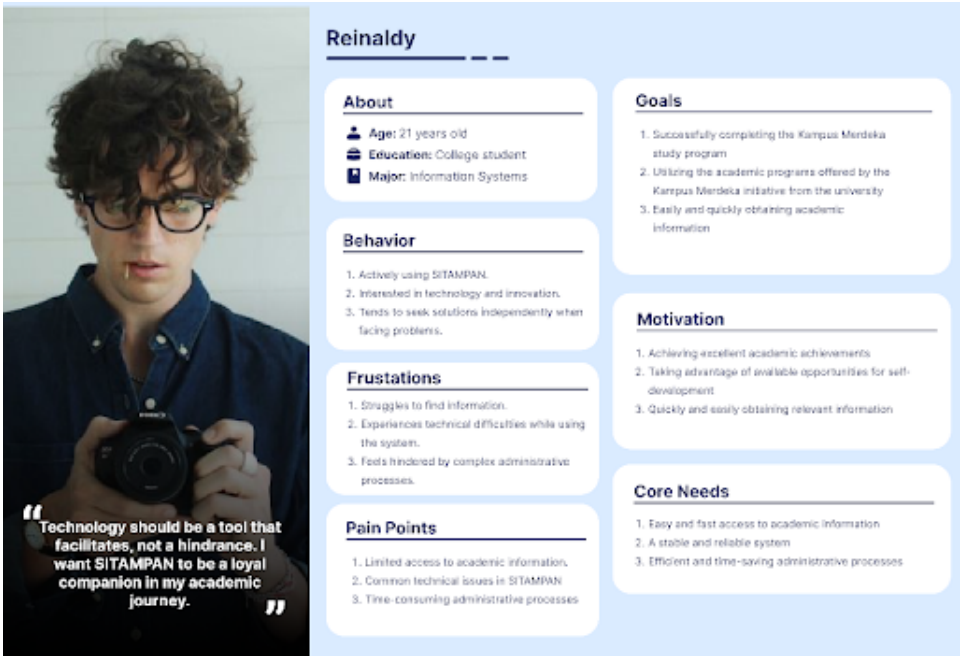

Figure 6. User Persona

Figure 6 illustrates a User Persona for SITAMPAN, representing a typical student user profile. This persona provides insights into common challenges faced by users, such as slow system response times and difficulties navigating through various features. Additionally, it highlights key user needs, including more efficient and seamless access to essential academic information that supports their learning activities. By understanding these needs and challenges, the persona helps identify critical areas for usability improvements. This serves as a guide for developing a more responsive and user friendly design for SITAMPAN, ultimately enhancing the overall user experience.

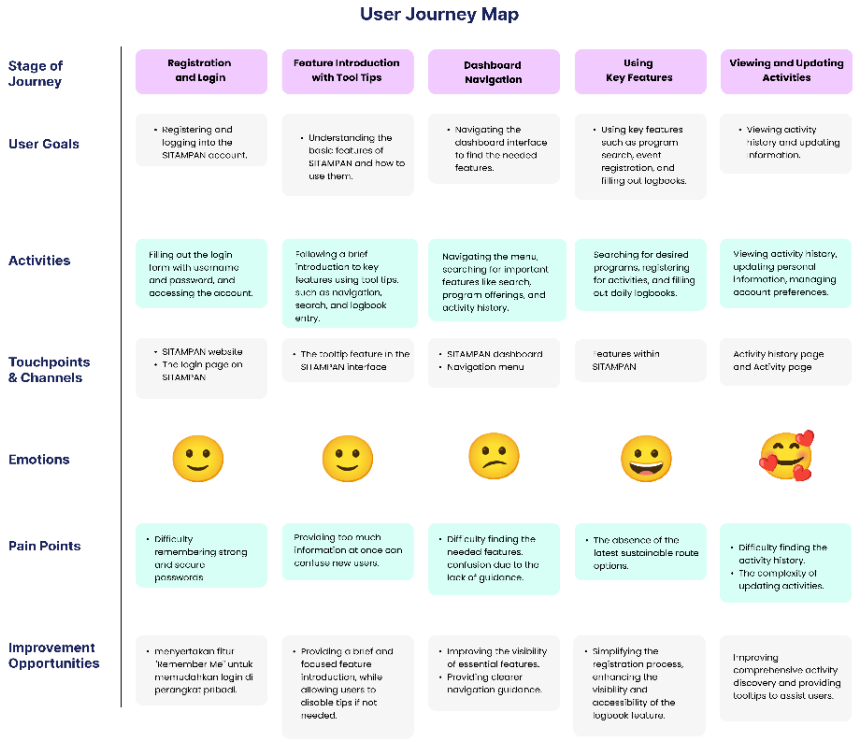

Figure 7. User Journey Map

As seen in Figure 7, the User Journey Map for SITAMPAN outlines user goals, activities, emotions, pain points, and improvement opportunities across each stage. It highlights user frustrations and areas for enhancing satisfaction and ease of use.

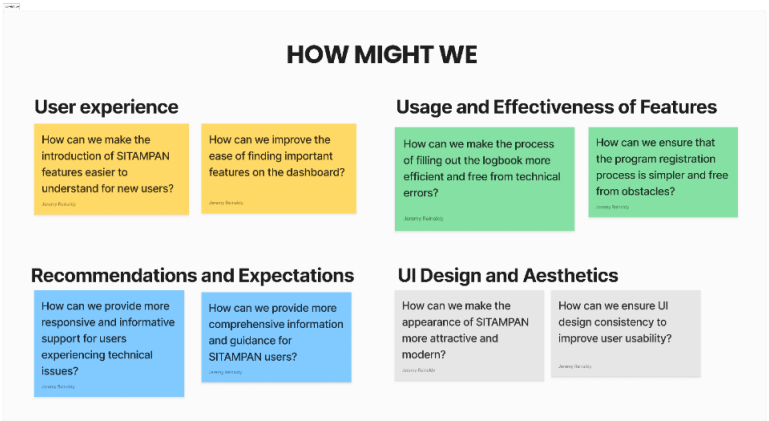

Figure 8. How Might We (HMW)

As shown in Figure 8, the ”How Might We” (HMW) framework identifies key user-focused questions to improve SITAMPAN’s usability, feature effectiveness, and UI design. These statements guide targeted enhancements for a better user experience.

3.2.3. Ideate

In this stage, low fidelity wireframes are created, as seen in Figure 9, to illustrate the basic structure and layout of the user interface without much detail.

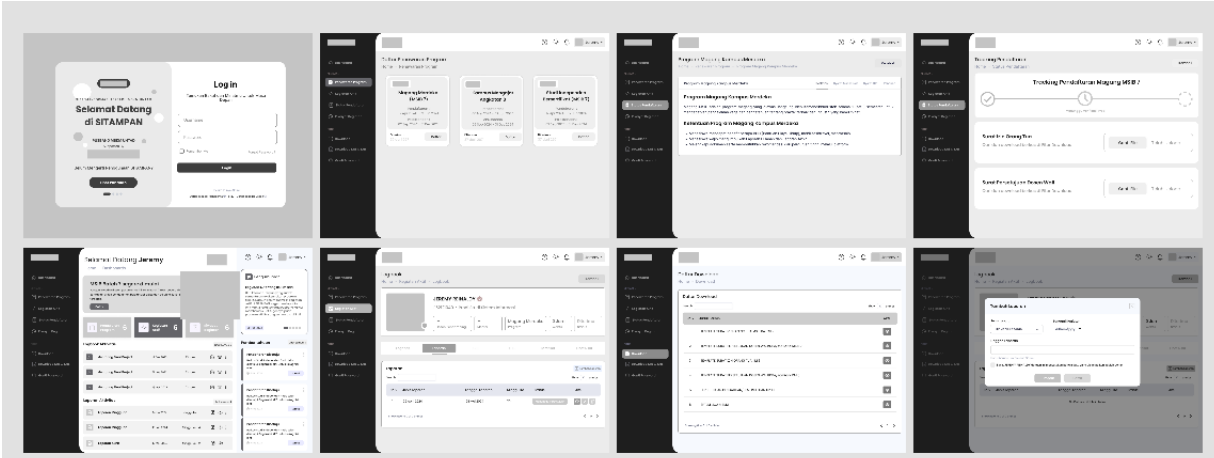

Figure 9. Wireframe Low Fidelity

Figure 9 displays low fidelity wireframes illustrating the basic structure and layout of SITAMPAN's user interface, highlighting general placement without detailed design elements.

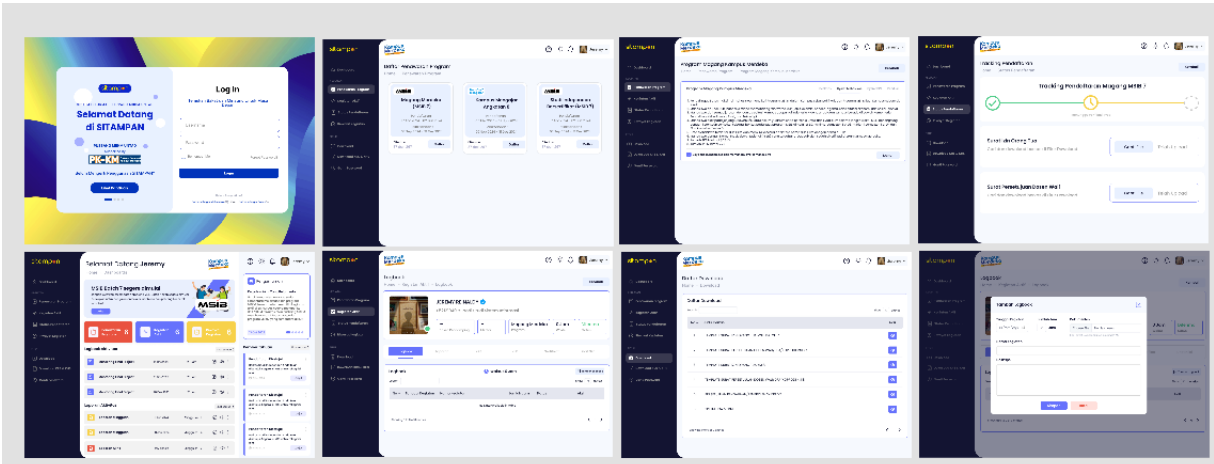

Figure 10. Wireframe High-Fidelity

Next, a high-fidelity wireframe was developed, as shown in Figure 10, which provides a more detailed and realistic representation of the final design, including more complete visual and interactive elements.

3.2.4. Prototype

After completing the high-fidelity design, the next task involves developing a high-fidelity model using Figma Tools. This prototype for SITAMPAN is depicted in Figure 11. To view the prototype further, visit the following link: SITAMPAN Figma Prototype.

Figure 11. High-Fidelity Wireframe

As shown in Figure 11, the high-fidelity wireframe for SITAMPAN demonstrates detailed interface design and user flow connections, providing a closer view of the final prototype.

3.3. Final Evaluation Results

In the final stage, the user interface of SITAMPAN was evaluated again using two methods: the System Usability Scale (SUS) assessment and the User Experience Questionnaire (UEQ). The purpose of this evaluation is to assess whether the implemented design recommendations have enhanced the user experience and ensured their overall satisfaction.

3.3.1. System Usability Scale (SUS) Test Results

The following are the findings from the SUS measurement related to the new design recommendations for SITAMPAN. Table 6 below shows the respondents answers to the 10 SUS questions used to assess the usability of the new design.

Table 6. Respondents Answers to the SUS Questionnaire

Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R1	4	2	4	1	4	1	3	2	5	1
R2	5	2	5	3	5	2	4	2	5	3
R3	5	2	5	3	5	1	5	2	5	1
R4	4	1	5	2	5	2	4	1	4	2
R5	3	2	4	2	3	1	5	1	4	2
R6	5	2	4	2	5	1	5	1	5	1
R7	4	2	4	1	5	1	5	1	4	1
R8	4	2	4	2	4	1	4	2	4	2
R9	5	2	4	2	5	1	5	1	5	1
R10	5	3	4	1	5	1	4	1	5	1

The responses in Table 6 provide insights into the usability of SITAMPAN's new design, highlighting areas where users experienced improvements and where further adjustments may still be needed.

After collecting the SUS questionnaire responses, calculations were made by subtracting 1 from the scores for the odd-numbered statements and subtracting the scores from 5 for the evennumbered statements.

The overall SUS score is calculated by totaling the values of each response, then multiplying by 2.5. Please refer to Table 7 for the SUS score results.

Table 7. Respondents Answers to the SUS Questionnaire

Respondent	Question										Total	SUS Score Value (Total x 2.5)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
R1	3	3	3	4	3	4	4	3	4	3	33	82.5
R2	4	3	4	3	4	2	3	3	4	2	32	80
R3	4	3	4	4	4	4	4	4	4	4	37	92.5
R4	3	4	4	3	4	4	4	3	4	3	36	90
R5	3	4	4	4	4	4	4	3	4	3	37	92.5
R6	4	3	4	4	4	4	4	3	4	4	37	92.5
R7	3	4	3	4	4	4	4	3	4	3	36	90
R8	3	3	3	3	3	4	3	3	3	3	31	77.5
R9	3	3	3	4	3	4	4	3	4	3	30	75
R10	4	2	3	4	4	3	4	4	4	4	36	90
									Average SUS score			**86.25**

Table 7 shows the SUS scores for each respondent after evaluating SITAMPAN's new design. Scores were calculated by adjusting each response as per SUS scoring rules and then multiplying the total by 2.5. The results indicate an average SUS score of 86.25, suggesting a high level of user satisfaction and usability for the new design, with most individual scores falling in the "Good" to "Excellent" range. This indicates that the recent design improvements have positively impacted the user experience.

The evaluation results using the SUS method indicate that the information system SITAMPAN UNTAD achieved an average score of 86.25, placing it in the "A" category for grade and described as "Best Imaginable". This signifies that a majority of users rated the usability of this system as excellent. In terms of acceptability, this score is also classified as "Acceptable", indicating that the system meets users expectations overall. Additionally, in the Net Promoter Score (NPS) measurement, SITAMPAN UNTAD is categorized as a "Promoter", demonstrating a high level of user satisfaction and likelihood of recommending the system to others. These results affirm that the design recommendations have successfully enhanced the usability of the system significantly, creating a satisfying user experience and promoting user recommendations. The interpretation of these findings is detailed in Figure 12.

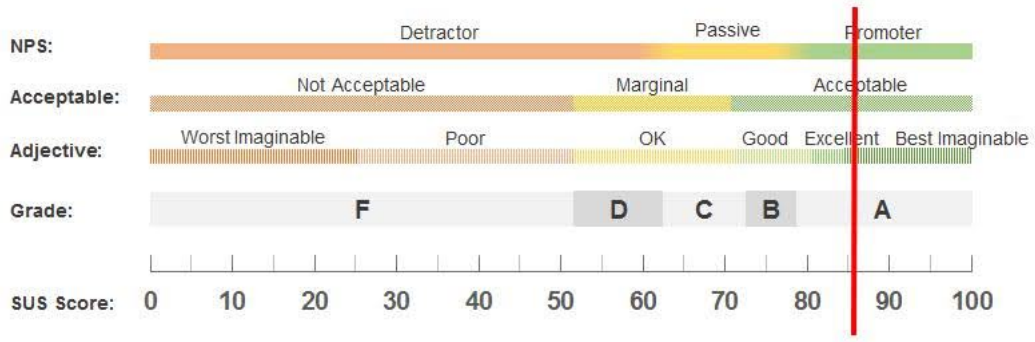

Figure 12. System Usability Scale (SUS) Rating Scale

Figure 12 shows that SITAMPAN UNTAD achieved an average SUS score of 86.25, rated "Best Imaginable" in the "A" category, indicating excellent usability. The system is also classified as a "Promoter" in the NPS measurement, showing high user satisfaction and strong likelihood of recommendation. These results confirm that the design improvements have significantly boosted usability and user experience.

3.3.2. Results of the User Experience Questionnaire (UEQ)

The outcomes from the UEQ questionnaire after participants tested the SITAMPAN system prototype are depicted in Figure 13 and Table 8.

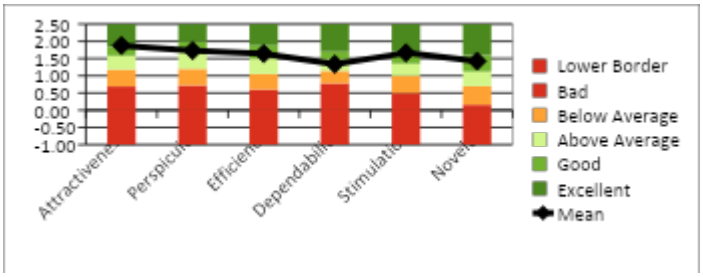

Figure 13. User Experience Questionnaire (UEQ) Rating Scale

Figure 13 shows that SITAMPAN received mostly ”Good” and ”Excellent” ratings, indicating positive user perceptions across various experience dimensions.

Table 8. Benchmark UEQ Assessment Results

Scale	Mean	Comparison to Benchmark
Attractiveness	1.88	Excellent
Perspicuity	1.73	Good
Efficiency	1.64	Good
Dependability	1.34	Above Average
Stimulation	1.66	Good
Novelty	1.42	Good

Table 8 reveals that SITAMPAN scored ”Excellent” in Attractiveness, ”Above Average” in Dependability, and ”Good” in other areas, confirming that the design improvements have met user expectations.

The assessment outcomes utilizing the UEQ approach indicate that SITAMPAN obtained outstanding scores across all evaluated aspects. The Attractiveness aspect achieved a score of 1.88, which was classified as ”Excellent”, indicating that users find the system very appealing. Perspicuity scored 1.73 and Efficiency scored 1.64, both falling into the ”Good” category, showing that the system is easy to understand and assists users in completing tasks quickly. Dependability scored 1.34 ”Above Average”, indicating that users perceive the system as reliable. Stimulation received a score of 1.66 ”Good”, showing that the system provides an enjoyable experience, while Novelty scored 1.42 ”Good”, indicating that users find the system innovative. Overall, these results demonstrate that the design recommendations have successfully met and exceeded user expectations across various aspects of the user experience.

4. MANAGERIAL IMPLICATIONS

To address gaps in this research, the following suggestions could be the focus of further studies. Involving comprehensive system implementation with users from various roles such as faculty, administrators, and partners would provide a more holistic understanding of user experience. Furthermore, developing an interactive mobile version of the system could enhance accessibility. Lastly, exploring the use of additional evaluation methods such as direct user observation would provide deeper insights into user experience.

5. CONCLUSIONS

The initial evaluation of the Integrated Information System MBKM & Academic Services (SITAMPAN) at Tadulako University highlighted substantial usability and user experience limitations before implementing design improvements. The System Usability Scale (SUS) assessment yielded an average score of 41.75, graded as ”F” and described as ”Poor,” underscoring the system’s insufficient usability. Additionally,

the Net Promoter Score (NPS) categorized SITAMPAN as a ”Detractor,” indicating significant user dissatisfaction. The User Experience Questionnaire (UEQ) similarly revealed low scores across all dimensions, with Attractiveness at 0.26, Perspicuity at 0.33, Efficiency at 0.18, Dependability at 0.39, Stimulation at 0.21, and Novelty at -0.18, all rated as ”bad.”

Following the application of user-centered design recommendations through the Design Thinking method, the system's performance showed marked improvement across all usability metrics. The SUS score rose to 86.25, achieving an ”A” grade and described as ”Best Imaginable,” reflecting excellent usability. The NPS shifted to the ”Promoter” category, indicating a high level of user satisfaction. UEQ scores also improved significantly, with Attractiveness reaching 1.88 (”Excellent”), Perspicuity 1.73 (”Good”), Efficiency 1.64 (”Good”), Dependability 1.34 (”Above Average”), Stimulation 1.66 (”Good”), and Novelty 1.42 (”Good”). These findings validate that the Design Thinking approach effectively addressed the system's usability issues, enhancing user experience and confirming the appropriateness and impact of the implemented design solutions.

In conclusion, this study demonstrates that structured user-centered design methodologies, such as Design Thinking, can lead to substantial improvements in usability and user satisfaction within academic information systems. Future research could expand on this work by exploring the applicability of mobile versions and incorporating additional evaluation methods, such as direct observation, to further optimize educational systems usability and engagement.

6. DECLARATIONS

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Conceptualization: JR, SA, WW, and DS; Methodology: JR, SA, WW, and DS; Software: JR, SA, WW, and DS; Validation: JR, SA, WW, and DS; Formal Analysis: JR, SA, WW, and DS; Investigation: JR, SA, WW, and DS; Resources: JR, SA, WW, and DS; Data Curation: JR, SA, WW, and DS; Writing Original Draft Preparation: JR, SA, WW, and DS; Writing Review and Editing: JR, SA, WW, and DS; Visualization: JR, SA, WW, and DS; All authors, JR, SA, WW, and DS, have read and agreed to the published version of the manuscript.

6.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

6.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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