

EVALUATION OF USABILITY AND USER INTERFACE DESIGN TO ENHANCE USER EXPERIENCE THROUGH HEURISTIC EVALUATION APPROACH AND LEAN UX METHOD WITH ISO 13407 STANDARDS

Case Study : SISTER Kemendikbud Ristek RI

Gigih Forda Nama^{*1}, Siti Waqiah¹, Mahendra Pratama¹

¹ Informatics Engineering, University of Lampung, Jl. Prof. Soemantri Brojonegoro, Bandar Lampung

Riwayat Artikel

Submitted :09/01/2026
Published :28/04/2026

*Email Korespondensi:
gigih@eng.unila.ac.id



Abstract: Sistem Informasi Sumberdaya Terintegrasi (SISTER) is a system that integrates services within the scope of higher education resources and data integration with the Higher Education Database (PDDIKTI). This study aims to evaluate usability using the Heuristic Evaluation questionnaire, Usability Testing in the Lean UX phase, and ISO 13407 Evaluation in the final testing phase. The distribution of the questionnaire resulted in 676 responses, with 397 samples used and involving 3 evaluators in Usability Testing during the Lean UX phase. In the final phase, the evaluation was conducted according to ISO 13407 standards, involving 9 respondents to test the prototype using task scenarios. The evaluation results showed an average score of <1200 and a mean score of <3, indicating a low level of user satisfaction with the system. Additionally, a TCR value of <65% also indicated that the system's interface was considered fair or average by users. On the other hand, the Usability Testing results identified improvements related to redundant pop-up messages and over-engineering of outline buttons in the prototype. This list of issues served as a reference for compiling recommendations and design improvements based on the 10 usability heuristics. After making improvements, the ISO 13407 evaluation results achieved a score of 80.89%, indicating a Good qualification.

Keywords: Usability Evaluation, Heuristic Evaluation, Lean UX, Usability Testing (UT), ISO 13407, Sistem Informasi Sumberdaya Terintegrasi (SISTER)

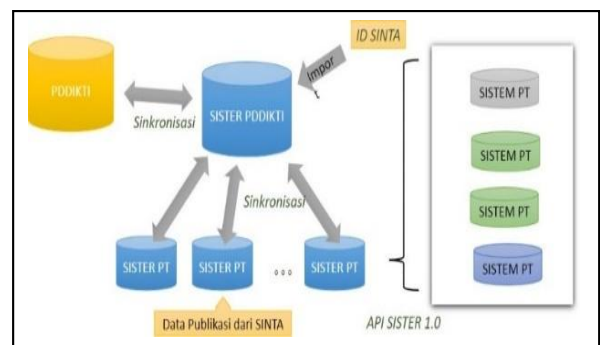
1. PENDAHULUAN

According to Permendikbudristek Number 28 of 2021 concerning the Directorate of Resources, which is under the Directorate General of Higher Education, Research, and Technology, its function is to facilitate resources in academic and professional higher education, as well as provide technical guidance and supervision in these fields. [1] One form of the implementation of these duties and functions is applied in an Sistem Informasi Sumberdaya Terintegrasi (SISTER), where this system is designed based on a circular letter from the Director General of Higher Education and is related to Permenristekdikti Number 61 of 2016, stating that this system is a subset of one of the tasks of the Higher Education Database (PDDIKTI), especially in terms of collecting higher education resource data. [2]

The process of filling in administrative service data for lecturers in SISTER often faces synchronization issues between the university and central systems, along with various versions of SISTER at each university. In 2023, SISTER was introduced in a cloud version with three main

advantages: a more centralized platform, automatic data synchronization, and increased system reliability. Now, all administrative activities for lecturers can be carried out on one integrated platform. [3]

Although SISTER is designed to improve the efficiency of higher education management, its implementation often faces challenges in usability and user interface aspects. With design



updates, SISTER must ensure ease of use for

Figure 1. SISTER Concept
(Source: Prasetyo 2022)

administrative staff, lecturers, researchers, and other stakeholders.

It seems necessary to evaluate and redesign the user interface to enhance the comfort and satisfaction of the user experience. To address this issue, the Heuristic Evaluation method, which consists of 10 evaluation principles, is used to provide quick and intuitive feedback in the early development stages and to facilitate the efficient identification of design problems. Next, the Lean UX method with its 4 development stages is chosen for its focus on user needs and the involvement of evaluators, allowing for more efficient testing and iteration. Then, ISO 13407 with its 5 principles is used to evaluate the prototype, involving users throughout the entire design process and resulting in a high level of usability in the final stage.

2. LITERATURE REVIEW

2.1 SISTER

The Directorate of Resources, under the supervision of the Directorate General of Higher Education, Research, and Technology, is developing a system known as the Sistem Informasi Sumberdaya Terintegrasi (SISTER). SISTER is designed to integrate several ongoing service processes, particularly within the Directorate of Resources. These services include the Certification of Lecturers, Workload of Lecturers services, and Credit Score Assessment services. Additionally, SISTER is being developed to integrate data with the Higher Education Database (PDDIKTI), aiming to eliminate redundant data entry across different systems within the Ministry of Education, Culture, Research, and Technology. [4]

2.2 Evaluation Usability

According to Jacobsen (1999), usability evaluation methods are divided into four types based on their evaluation goals: exploratory, predictive, formative, and summative. [5] According to James J. (1996), Evaluation is synonymous with the English term "Evaluation," referring to the process of assessment or judgment. Meanwhile, according to Nielsen (1993), Usability is a quality attribute that assesses how easy an interface is to use. The term "usability" also refers to methods for improving ease of use during the design process. [6]

2.3 User Experience

According to Don Norman, defining UX involves the first requirement for exemplary user experience, which is meeting customer needs accurately and effortlessly. Following this are simplicity and elegance, resulting in products that are enjoyable to own and pleasant to use. UX serves as a bridge between business goals and

user needs. Certainly, UX design involving users will achieve high success rates in delivering both business and user objectives. [7]

2.4 User Interface

User Interface (UI) is the mechanism of communication between the user and the system in a program, whether it's a website, mobile application, or software. This mechanism is tailored to meet the user's needs for the program under development. The scope of UI includes physical appearance, use of colors, animation effects, and the communication patterns of a program with its users. [8]

2.5 Heuristic Evaluation

Heuristic Evaluation is the quickest, cheapest, and most effective way to identify usability problems [9], involving an expert evaluating the interface against a set of recognized usability principles – 'heuristics' [10]. Heuristic Evaluation was first formally described in a presentation at the Human-Computer Interaction conference through a paper published by Nielsen and Molich (1990). [9]

According to Nielsen (1995) in his research, there are ten usability heuristic criteria for UI and UX design related to the appearance of a website. [10] :

1. Visible of system status
2. Match between system and the real word
3. User Control and freedom
4. Consistency and standars
5. Error prevention
6. Recognition rather than recall
7. Flexibility and effeciency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and revover from errors
10. Help and documentation

2.6 Lean UX

According to Gothelf (2013), Lean UX is a UI/UX design method that replaces conventional documentation techniques in design to expedite work with high intensity and focuses on designing actual experiences. Lean UX is a method that brings a tangible aspect of a product to achieve faster success and effectiveness collaboratively and cross-functionally by minimizing emphasis on documentation and instead focusing on improving understanding of the product experience being designed. [11]

In the Lean UX method, there are four development stages [11]:

- a) Declare Assumptions: creating a list of assumptions consisting of ideas, concepts, and issues used as a starting point in designing prototypes.
- b) Create an MVP (Minimum Viable Product): developing a prototype design.
- c) Run an Experiment: independently testing the prototype.

- d) Feedback and Research: testing the prototype with users and analyzing feedback to assess the prototype's success rate.

2.7 ISO 13407

ISO 13407 is an international standard established in 1999. ISO 13407 is a description of best practices in user-centered design that provides guidance on design activities throughout the lifecycle of interactive systems. It outlines iterative development cycles for accurately specifying product requirements, taking into account user and organizational requirements, and determining the context in which the product will be used. [12] ISO 13407 standard is aimed at managing the design process and does not provide detailed coverage of methods and techniques. [13]

2.6.1 Principles of ISO 13407

The working principles of ISO 13407 (Norman's Principles) can be seen below [7]:

1) Causality

The principle of causality can be explained in the following event: something that occurs after an action will be perceived by people/users as caused by that action.

2) Visible Constraints

Visible constraints are visual limitations. By looking, users will know the limitations of actions, capabilities, facilities, and functions of the application they are using. Users will understand the limitations of the number of actions possible from the appearance of objects. Users will understand the limitations of the application by seeing and feeling.

3) Mapping

Mapping defines the set of possible relationships between objects.

4) Transfer Effects

Humans tend to transfer lessons/expectations from similar objects. There are two types of transfer effects: positive transfer, where previous lessons can be applied to new situations, and negative transfer, where previous lessons differ from the new situation.

5) Population Stereotypes

People learn that idioms apply in certain ways. For example, red means danger and green means safe. However, idioms can differ across cultures. For instance, light switches in America are the opposite of those in the UK. Down means off in America, but in the UK, it's the other way around.

2.7 Likert Scale

The Likert scale was popularized by an American social psychologist named Rensis Likert (Likert, 1932) in his report titled

—Technique for the Measurement of Attitudes [14]. In the measurement of usability, respondents answer questionnaires by indicating the extent to which they agree with given statements. Respondents are asked to choose one of the available options, for example,

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

To determine the level of respondent achievement, the following formula is used [15]:

$$TCR = \frac{\text{Average Score} \times 100\%}{\text{Maximum Score}}$$

Tabel 1. (TCR)

NO	Achievement Presentation	Criteria
1	85% - 100%	Very good
2	66% - 84%	Good
3	51% - 65%	Enough
4	36% - 50%	Less Good
5	0% - 35%	Not Good

2.8 Slovin's Formula

Slovin's formula is a method or formula for calculating the minimum sample size when the behavior of a population is not known exactly. This formula was first introduced by Slovin in 1960 [16].

The form of the Slovin's formula is: $n = \frac{N}{1 + Ne^2}$

n is the sample size to be determined

N is the population size and

e is the margin of error, which represents the expected or set error size.

2.8 Style guideline

A style guideline is a document composed of a set of rules in design. It is a document that provides specific guidance for implementation, visual references, and design principles used in creating interfaces or other designs. The creation of a style guideline aims to maintain consistency across every element created in the design. Common style guidelines often focus on brand identity (colors, typography, trademarks, logos, and print media), but they also provide guidance on content, visual design, and interaction [17].

2. 9 SPSS (Statistical Product and Service Solution)

SPSS or Statistical Product and Service Solution is a computer application used for statistical calculations. Its advantage lies in its ability to perform statistical computations, from simple to highly complex, much faster than manual methods. Users only need to design variables for analysis, input data, and perform calculations using the steps available in the menu. [18].

2. 10 Figma

Figma is a web-based design tool that allows users to create, edit, and share user interface (UI) and user experience (UX) designs. In Figma, pages refer to separate workspaces where specific design elements are arranged and organized. Additionally, Figma features components that enable users to create and utilize reusable design elements, thus facilitating consistency in product design [19].

2.11 Related research

2.11.1 Set of Usability Heuristic for Quality Assessment of Mobile Application on Smartphone

The study conducted by Costa et al. in 2019 presents a set of general heuristics relevant in the context of mobile applications, highlighting important usability factors considering users, tasks performed by users, and context as crucial aspects of usability. [20]

2.11.2 Usability Evaluation on the SIPR Website Uses the System Usability Scale and Net Promoter

The research conducted by Pradini et al. in 2019 employed a research method involving data collection and analysis using a questionnaire based on the System Usability Scale (SUS) to evaluate system usability and the Net Promoter Score (NPS) to measure user satisfaction with the system. [21]

2.11.3 Development of an Islamic Higher Education Institution Tracer Study Information System and It's Performance Analysis using ISO/IEC 25010

The research conducted by Anggraini et al. in 2019 discusses the implementation stages of system quality analysis and testing based on ISO/IEC 25010 standards, which include functional suitability, performance efficiency, compatibility, usability, reliability, maintainability, and portability. [22]

2.11.4 Characterizing UX Evaluation in Software Modeling Tools: A Literature Review

The research conducted by Kalantari and Lethbridge in 2022 discusses the types and evaluation methods applied by researchers when studying UX in modeling tools (Modeling experience MX) through an analysis of recent literature. [23]

2.11.5 Usability Evaluation of the Smartphone User interface in Supporting Elderly Users From Experts' Perspective

The research conducted by Salman et al. in 2018 used the SMASH heuristic evaluation technique to discover usability issues that can be anticipated. The study aimed to identify potential usability problems faced by the elderly when interacting with the user interface (UI) on smartphones, and to recommend UI design improvements. [24]

2.11.6 The use of a mixed method approach to evaluate m-Government implementation

The research conducted by Noprisson et al. in 2016 discusses the implementation of m-government using the System Usability Scale (SUS) as a simple quantitative research method to evaluate systems from the user perspective. The study also employs a qualitative approach using dimensions from the D&M IS Success Model. [25]

2.11. 7 Implementation of Lean UX method on ui/ux design of digilib unsika application in windows version

The research conducted by Syifa et al. in 2022 utilized the Lean UX method, which consists of four cycles: declare assumptions, create an MVP, run an experiment, and feedback and research. To understand user needs and satisfaction, they employed the Thinking Aloud technique and tested the system's usability using the System Usability Scale (SUS). [26]

2.11.8 Usability Evaluation by Applying Heuristic Evaluation Method on the Education Department Website of Batu City

The research conducted by Pratama et al. in 2022 used the Heuristic Evaluation method consisting of 10 evaluation principles, identifying 11 usability issues based on the average Severity Rating. Recommendations for improvement were made by creating a prototype using Figma tools with the Material Design Guidelines by Google. [27]

2.11.9 Website Analysis Using Heuristic Evaluation Based on Severity Ratings and System Usability Scale

The research conducted by Balafif in 2022 focused on identifying severity ratings of UI usability on the which is built on a government-centric basis. The methodology employed in this research involved quantitative research with a questionnaire based on heuristic evaluation assessments using severity ratings and the System Usability Scale.[28]

2.11.10 Usability Evaluation of MY JNE Application Using User Experience Questionnaire (UEQ) and Heuristic Evaluation

The research conducted by Kurniawan et al. in 2019 utilized the UEQ (User Experience Questionnaire) method to obtain quantitative user experience feedback and Heuristic Evaluation to gather qualitative assessments from evaluators.[29]

2.11.11 Designing the Lean UX Method at Universitas Dr. Soetomo

The research conducted by Saputra et al. in 2018 utilized a solution to design specific UI/UX for mobile devices using the Lean UX method, consisting of 4 development stages. The results showed a significant improvement in the user interface compared to before, addressing previous usability issues. [30]

2.11.12 User Interface and User Experience for Managing Customer Satisfaction

The research conducted by Wiwesa in 2021 outlines 5 stages in the UI/UX workflow process, starting from research and problem analysis, UX design with wireframe and prototype creation, to UI design stage for refining wireframes and conducting evaluation by Research. [31]

2.11.13 Evaluation and Design of User Interface to Enhance User Experience using Human-Centered Design Method and Heuristic Evaluation on Ezyschool Application

The research conducted by Arifin et al. in 2019 utilized the Human-Centered Design (HCD) approach and applied Heuristic Evaluation (HE) method to identify and evaluate usability issues based on heuristic principles with the assistance of experts (evaluators). [32]

2.11.14 Designing User Interface/User Experience for Student Academic Information System (SIAM) using Lean User Experience (Lean UX) Method at Universitas Wr. Supratman

The research conducted by Budistria et al. in 2020 designed specific UI/UX for smartphones using the Lean UX method, which consists of four development stages. The first iteration of the prototype achieved an 85% success rate, with the majority agreeing with the new SIAM prototype design. [33]

3. RESEARCH METHODOLOGY

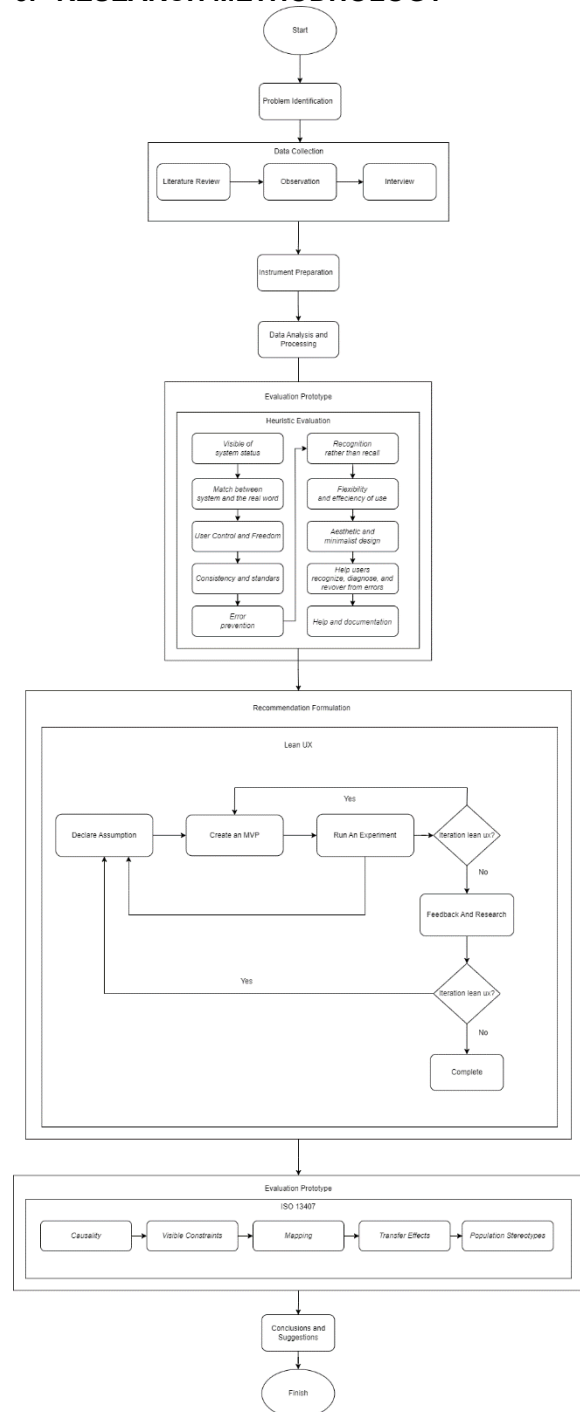


Figure 2 Flowchart of Research Stages

3.1 Method of Collecting Data

In conducting the data collection process, qualitative data collection techniques include literature review, observation, and interviews, while quantitative methods involve distributing questionnaires using the Heuristic Evaluation (HE) method. The final stage of questionnaire distribution evaluates prototypes using the ISO 13407 Evaluation method. Data distribution targets respondents based on their university region of origin, functional position level, gender, and age range.

3.2 Research Instrument

3.2.1 Determining the Population and Number of Research Samples

The study sampled active assessors of the Integrated Resource Information System (SISTER) distributed across each province. The total number of higher education institutions in Indonesia reaches 5,478, with approximately 397,446 teaching faculty members spread across various provinces nationwide. The number of respondents considered active assessors who logged into SISTER during December 2023 was 23,558 active users.

After obtaining the population size, the next step is to determine the research sample using the Slovin technique with a maximum error rate of 5%. The formula used to calculate the sample size can be detailed as follows:

$$n = \frac{N}{1 + Ne^2}$$

Then, several possible sample sizes can be calculated.

Untuk $e = 5\%$

$$n = \frac{23558}{1 + 23558 \times 0.05^2}$$

$$n = 394,322$$

Thus, a sample size of approximately 394 was obtained, rounded from 394.322.

3.3 Data Analysis and Processing

The stages involve processing quantitative data obtained from filling out heuristic usability questionnaires and ISO 13407 questionnaires to obtain heuristic evaluation analysis results. Data on score values, means, and Respondent Achievement Levels (TCR) are obtained from respondents.

3.4 Design and Evaluation Methods

3.4.1 Design Stages

The proposed design stage for the next step is creating low-fidelity wireframes using Figma tools. The resulting wireframes will have a low resemblance to the prototype to be developed. Here are the wireframe results using Figma tools:

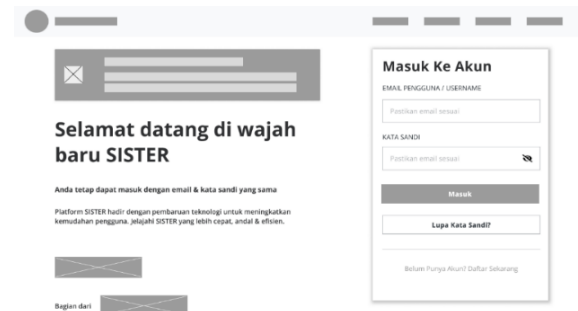


Figure 3. Wireframe Homepage

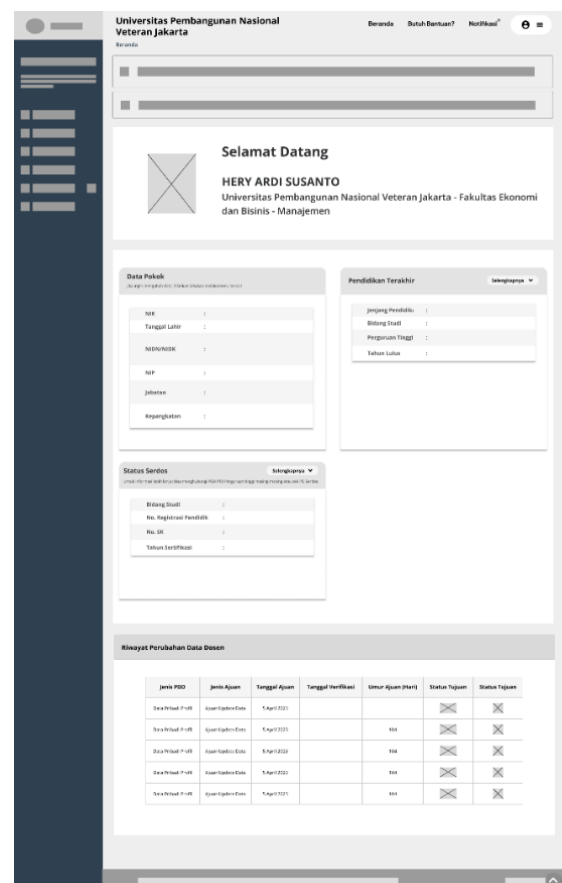


Figure 4. Wireframe Dashboard

3.4.2 Implementation Stages

The design stage is based on the analysis results and wireframe design conducted using the 4 stages of Lean UX development, which consist of

Declare Assumptions, create an MVP, run an experiment, and feedback and research.

3.4.3 Evaluation Stages

The evaluation stage using ISO 13407 occurs after the prototype design has been tested by users and experts. Prototype testing will be conducted with 1 user (in the run an experiment stage) and with user testing by 3 users. Subsequently, questionnaires will be distributed and usability testing will be conducted to test the prototype with 9 users.

4. RESULTS AND DISCUSSION

4.1 Data Collection

Data collection was conducted using a usability questionnaire encompassing 10 Heuristic Evaluations. A total of 676 responses were obtained from the distributed questionnaires, including 3 responses filled out by evaluators (experts). All responses underwent cleansing, revealing 7 duplicate entries and 10 invalid entries. Consequently, 559 valid responses were obtained from SISTER users, of which only 397 samples (including 3 evaluators) were derived using the Slovin formula.

Next, Lean UX testing will involve task scenario usability testing. Prototype testing will be conducted with 1 user (in the run an experiment stage) and with user testing by 3 evaluators to ensure that the created prototype meets user needs and to validate assumptions made in earlier stages. The evaluation results will produce a list of improvements if users are dissatisfied with the design outcomes.

Subsequently, the next step involves conducting usability testing with SISTER Assessors, who are lecturers in the University of Lampung environment, involving 9 respondents using task scenarios as guides to run their prototypes. Afterwards, respondents will fill out questionnaires related to ISO 13407.

4.1.2 Respondent Characteristics

Characteristics of respondents based on region, functional position, gender, and age range. From Figure 4.1, it can be observed that the number of male respondents is 257, while the number of female respondents is 140.

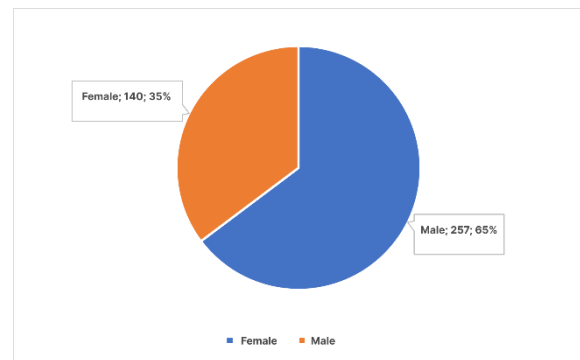


Figure 5. Percentage of Respondents Based on Gender

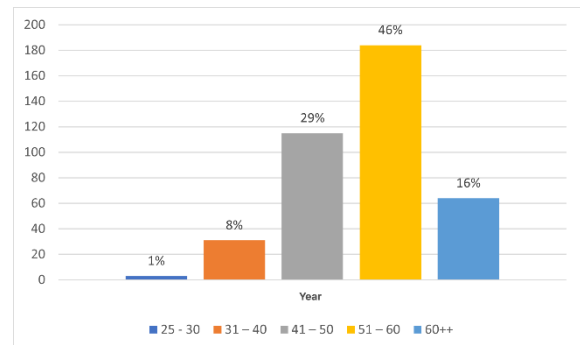


Figure 6. Percentage of Respondents Based on Age Range

From the age range provided, the majority of respondents fall within the 51-60 age bracket, indicating the dominance of senior and experienced users among BKD SISTER assessors. Users in the 31-40 age range, although fewer in number, show remarkable presence, possibly due to significant achievements in their academic or professional careers. Respondent characteristics also serve as the basis for processing data distribution based on region and functional positions.

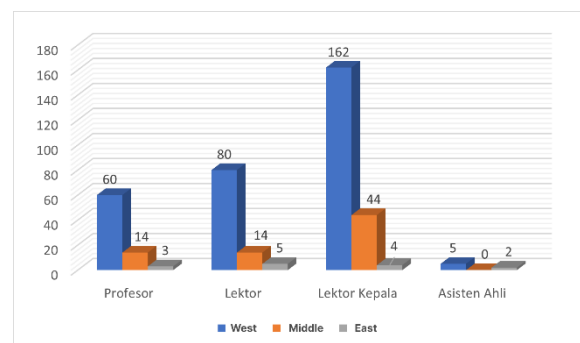


Figure 7. Percentage Distribution of Respondents by Region and Position

Based on Figure 7, it is noted that approximately 78.12% (307) of respondents are from Western Indonesia. Furthermore, there are 18.32% (72) of respondents from Central Indonesia. Lastly, Eastern Indonesia has about 3.56% (14) of respondents.

4.2 Data Analysis and Processing

Based on the heuristic evaluation analysis, data on score values, mean, and Respondent Achievement Level were obtained from respondents. Out of the 10 heuristic components, 5 components were identified needing improvement, including: Match Between System and Real World, Error Prevention, Recognition Rather Than Recall, Help Users Recognize, Diagnose, and Recover From Errors, and Help and Documentation. Among these 5 heuristic components, 6 statements indicated areas needing improvement. The average score obtained from these 6 statements was <1200, indicating a performance deficit in display. Furthermore, the mean score was <3, reflecting low user satisfaction with the system. Additionally, a TCR value of <65% was obtained, indicating the respondent achievement level, suggesting that the system's display is perceived as adequate or average by users.

4.3 Preparing Recommendations and Designing (Lean UX)

4.3.1 Declare Assumptions

In the declare assumptions stage, the problem statement is identified from the evaluation of the BKD Assessor service features on the SISTER website. This issue is derived from user feedback and the results of the Heuristic Evaluation (HE) questionnaire, which includes frequency and mean values of respondents. The frequency and mean results indicate that out of 10 heuristic evaluation components, 5 of them show improvement indicators encompassing 6 statements. These improvement indicators will be analyzed and adjusted according to suggestions/feedback from assessor users.

4.3.1 Create Minimum Viable Product

Due to the absence of a Style Guide on the current website, the task at hand is to create a design system comprising logos, colors, typography, icons, buttons, and several other components.

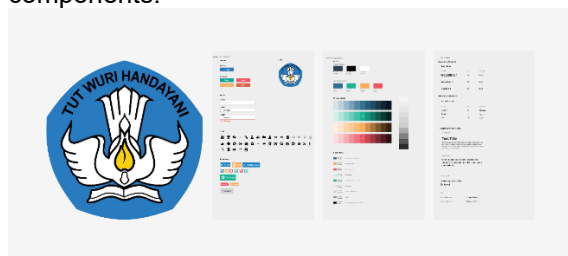
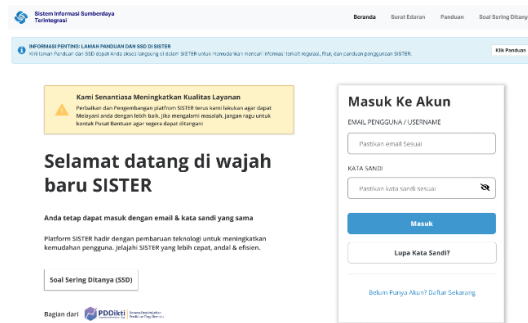
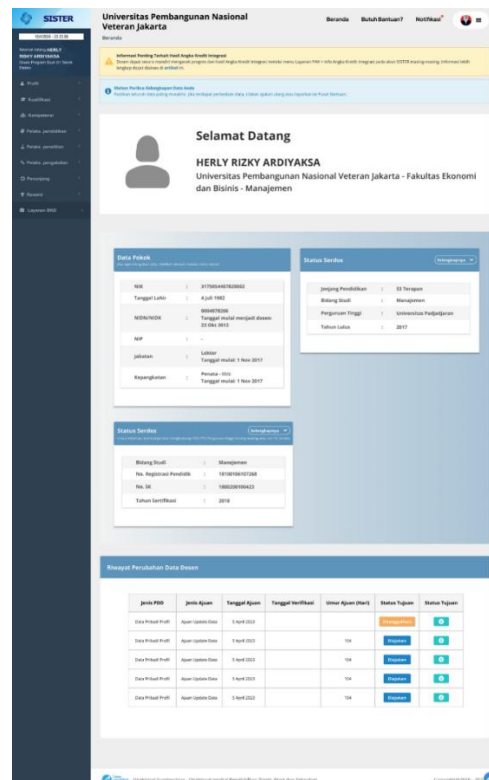


Figure 8. Design System

The next step is to create a prototype (Create minimum viable product) using Figma tools. Here is a high-fidelity wireframe design based on the results of Heuristic Evaluation questionnaires, observations, and interviews:



Gambar 9. Mockup Homepage



Gambar 10. Mockup Dashboard

From the wireframe creation results that have been adjusted according to the identified problem statement in the declare assumptions stage, the prototype link has been provided and can be accessed publicly. The goal is to enable further review and transparency of the research findings. Here is the prototype link: (<https://bit.ly/prototypeSISTER>)

4.3.3 Run An Experiments

In this stage, a self-testing of the prototype was conducted involving demos and previews with one individual to gather feedback on the developing design. Evaluation results indicate that the prototype does not require further improvements. Here are the responses or comments provided:

Table 2. Comments from Run An Experiment Testing

Age	Graduate	Experience	Feedback/Comment
22	S1 Computer Science	1 Year	When testing the prototype, users shared their opinions about their experience with the prototype. Users provided the following comments: - The homepage layout is neat and not confusing. - The prototype aligns with the previous problem statement. - New features such as "Notifications" and "Scroll to top" are very helpful for users. - The use of fonts, colors, and layout feels interactive and good.

4.3.4 Feedback and Research

In this phase, task scenario usability testing was conducted on the initial prototype with 3 experts. Feedback from the testing indicated that the user interface (UI) design is quite good and meets user needs. However, regarding the prototype, there are several recommendations for improvement that need to be considered. These include addressing redundancy in pop-up messages and over-engineering of outline buttons in the prototype.

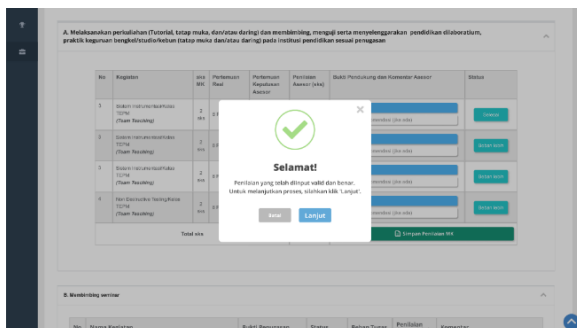


Figure 11. Current state of pop-up message

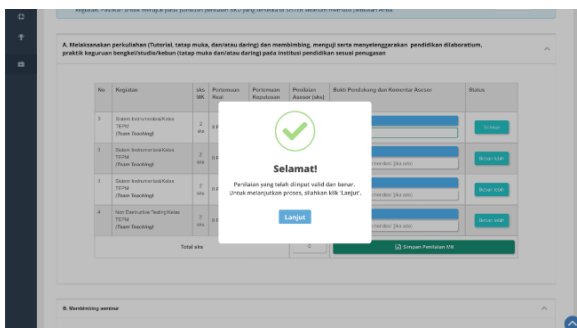


Figure 12. Proposed state of pop-up message

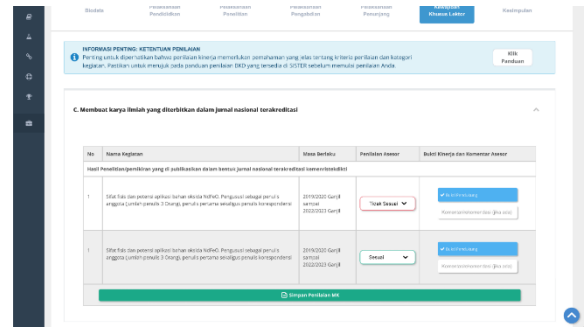


Figure 13. Current state of outline button improvement

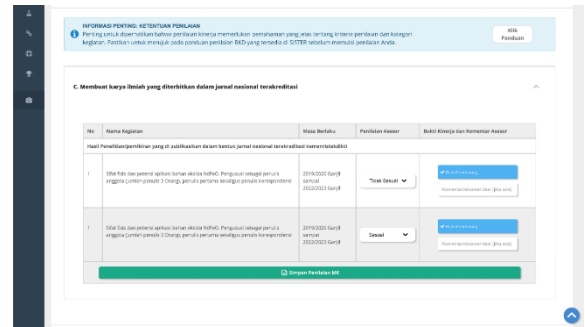


Figure 14. Proposed state of outline button improvement

4.4 Evaluation ISO 13407

In the ISO 13407 evaluation, usability testing was conducted to test the prototype and distribute questionnaires offline among 9 users. The usability testing respondents can be seen based on the distribution of functional positions and gender of BKD Assessor lecturers.

Respondents were evenly distributed across various functional positions, namely Asisten Ahli (AA), Lektor (LEK), Lektor Kepala (LK), and Professor (GB). Table 4.6 shows the distribution data of usability testing respondents based on functional positions and gender of BKD Assessor lecturers.

Table 3. Usability Testing Respondents by Functional Position

Position	Gender	Number of Respondents
Profesor	Female	1 Person
Asisten Ahli	Female	1 Person
	Male	2 People
Lektor	Female	3 People
	Male	2 People
Lektor Kepala	-	-
Total		9 People

The age distribution of usability testing respondents shows that the majority are in the 41-50 age group, accounting for 56%, while the 51-60 age group has a percentage of 44%. This can be seen in Figure 14 below.

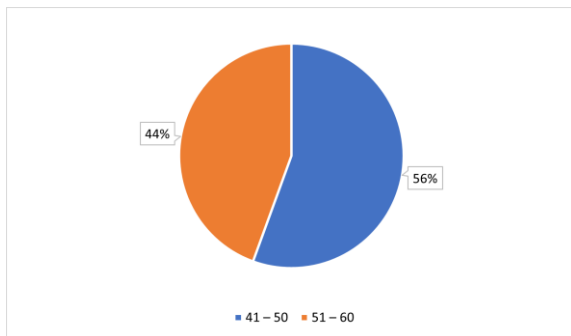


Figure 15. Age Range Percentage of Usability Testing Respondents

4.4.1 Analysis with ISO 13407 On the SISTER web display

The calculation process obtained score data and Respondent Achievement Rate (TCR) from respondents. Then, the interface and usability values were obtained using the percentage index formula.

Presentase :

$$= \frac{40+41+36+40+35+34+38+33+33+34}{45} \times 100\%$$

$$= \frac{364}{45} \times 100\%$$

$$= 80,89\%$$

This process resulted in a final score of 80.89%, indicating a Good level of satisfaction.

5. CONCLUSION

1. Usability evaluation using the Heuristic Evaluation (HE) questionnaire yielded 676 responses, with 397 samples used for analysis. Respondent analysis was used for processing data distribution based on region, gender, and age range. Out of 10 HE components, 5 require improvement as indicated in Table 4.1, covering 6 statements. The evaluation resulted in an average score <1200 and a mean score <3, indicating a low level of user satisfaction with the system. Additionally, a TCR value <65% also indicates that the system interface is perceived as sufficient or ordinary by users. This suggests that the SISTER usability still requires improvements in both functionality and system interface design.
2. Design recommendations using the Lean UX method consist of 4 development stages. In

the declare assumptions stage, the problem statement is derived from user feedback and used to formulate a prototype in the create minimum viable product stage. During the run an experiment stage, a demo with 1 user indicated that the prototype was successful without needing further improvements. In the feedback and research stage, the prototype was tested by 3 evaluators, resulting in 2 comments for improvement regarding redundancy of pop-up messages and over-engineering of outline buttons in the prototype.

3. Prototype evaluation using a questionnaire based on the 5 Principles of ISO 13407 (Norman Principles) was conducted with active users, Asesor from Universitas Lampung. Testing with scenario-based tasks yielded 9 responses. Calculation using the % index formula resulted in a value of 80.89%, indicating a Good qualification level.

ACKNOWLEDGEMENTS

The author extends thanks to all involved parties who have supported this research.

DAFTAR PUSTAKA

- [1] Kemendikbudristek, "Peraturan Menteri Nomor 28 Tahun 2021 Tentang Organisasi dan Tata Kerja Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi.," *Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi*, Jakarta, 2021.
- [2] T. Prasetyo, "Evaluasi Usability Sistem Informasi Sumberdaya Terintegrasi: Studi Kasus Kementrian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia," Universitas Indonesia, Jakarta, 2022.
- [3] Ditjen. Diktiristek, Jakarta. *Sistem Informasi Sumberdaya Terintegrasi (SISTER)*, (2023).
- [4] Kemenristekdikti, "Permenristekdikti Nomor 61 Tahun 2016 Tentang Pangkalan Data Pendidikan Tinggi," *Kementerian Riset, Teknologi, dan Pendidikan Tinggi*, Jakarta, 2016.
- [5] N. E. Jacobsen, *Usability Evaluation Methods The Reliability and Usage of Cognitive Walkthrough and Usability Test*. Denmark: University of Copenhagen, 1999.
- [6] J. Nielsen and R. Molich, *Usability Engineering*. Academic Press, 1993.
- [7] D. A. Norman, *The design of everyday things*.
- [8] H. Himawan and M. Yanu, *Interface, User Experience*. Yogyakarta: Lembaga Penelitian dan Pengabdian kepada Masyarakat, 2020.
- [9] S. Y. Chen and R. D. Macredie, "The assessment of usability of electronic shopping: A heuristic evaluation," *Int J Inf*

- Manage*, vol. 25, no. 6, pp. 516–532, Dec. 2005, doi: 10.1016/j.ijinfomgt.2005.08.008.
- [10] J. Nielsen, “10 Usability Heuristics for User Interface Design,” 1995.
- [11] J. Gothelf, *Lean UX*. United States of America: O'Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472., 2013.
- [12] ISO, *ISO/IEC 13407 - Human Centred Design Process for Interactive Systems*. ISO/IEC 13407, 1999.
- [13] T. Jokela, N. Iivari, J. Matero, and M. Karukka, “The standard of user-centered design and the standard definition of usability,” in *Proceedings of the Latin American conference on Human-computer interaction*, New York, NY, USA: ACM, Aug. 2003, pp. 53–60. doi: 10.1145/944519.944525.
- [14] R. Likert, *A Technique For The Measurement of Attitudes*. New York, 1932.
- [15] Sugiyono, *Metode penelitian kuantitatif*, Cet. 1. Bandung : Alfabeta, 2018.
- [16] Y. R. Endra, Indonesia. *Cara Mencari Sampling Data Skripsi Denga Rumus Slovin*, (Feb. 05, 2021). Accessed: Nov. 21, 2023. [Online Video]. Available: <https://youtu.be/MfY3mZvrtCs?si=QnZ5dC7azkAUznMD&t=78>
- [17] T. Fessenden, “Design System 101,” Nielsen Norman Group.
- [18] Andi, *SPSS 20*. Yogyakarta, 2012.
- [19] A. Pramudani, “Analisis User Experience (UX) Menggunakan Metode User Questionnaire Dan Heuristic Evaluation Pada Sistem Virtual Class Universitas Lampung,” Universitas Lampung, Bandar Lampung, 2022.
- [20] R. Parente Da Costa, E. Di. Canedo, R. T. De Sousa, R. De Oliveira Albuquerque, and L. J. Garcia Villalba, “Set of Usability Heuristics for Quality Assessment of Mobile Applications on Smartphones,” *IEEE Access*, vol. 7, pp. 116145–116161, 2019, doi: 10.1109/ACCESS.2019.2910778.
- [21] R. S. Pradini, R. Kriswibowo, and F. Ramdani, “Usability Evaluation on the SIPR Website Uses the System Usability Scale and Net Promoter Score,” in *2019 International Conference on Sustainable Information Engineering and Technology (SIET)*, IEEE, Sep. 2019, pp. 280–284. doi: 10.1109/SIET48054.2019.8986098.
- [22] N. Anggraini, D. Putra, and N. Hakiem, “Development of an Islamic Higher Education Institution Tracer Study Information System and It's Performance Analysis using ISO/IEC 25010,” *International Conference on Cyber and IT Service Management*, 2019.
- [23] R. Kalantari and T. C. Lethbridge, “Characterizing UX Evaluation in Software Modeling Tools: A Literature Review,” *IEEE Access*, vol. 10, pp. 131509–131527, 2022, doi: 10.1109/ACCESS.2022.3227504.
- [24] H. M. Salman, W. F. Wan Ahmad, and S. Sulaiman, “Usability Evaluation of the Smartphone User Interface in Supporting Elderly Users from Experts' Perspective,” *IEEE Access*, vol. 6, pp. 22578–22591, Apr. 2018, doi: 10.1109/ACCESS.2018.2827358.
- [25] H. Noprisson, N. Husin, M. Utami, P. Rahayu, Y. G. Suchyo, and D. I. Sensuse, “The use of a mixed method approach to evaluate m-Government implementation,” in *2016 International Conference on Information Technology Systems and Innovation, ICITSI 2016 - Proceedings*, Institute of Electrical and Electronics Engineers Inc., Feb. 2017. doi: 10.1109/ICITSI.2016.7858195.
- [26] R. Mayasari, A. Susilo Yuda Irawan, and U. Singaperbangsa Karawang, “Implementation Of Lean UX Method On UI/UX Design Of Digilib UNSIKA Application In Windows Version,” *Journal of Information Technology and Computer Science (INTECOMS)*, vol. 4, no. 2, 2021.
- [27] H. Y. Pratama, T. B. Hanggara, and Y. N. Setiawan, “Evaluasi Usability dengan Menerapkan Metode Heuristic Evaluation pada Website Dinas Pendidikan Kota Batu,” *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, 6(3), 1350–1359., 2022.
- [28] S. Balafif, “Analisis website menggunakan Heuristic Evaluation berbasis severity ratings dan sistem usability scale,” *JINTEKS (Jurnal Informatika Teknologi dan Sains)*, vol. Vol. 4 No. 3, Aug. 2022.
- [29] B. D. R. Kurniawan, H. S. Wijoyo, and H. N. Wardani, “Evaluasi Usability Aplikasi MY JNE Dengan Metode User Experience Questionner (UEQ) dan Heuristic Evaluation,” *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, pp. 5583–5591, 2019.
- [30] E. Saputra,) Sulistiowati, J. Lemantara,) Program, S. / Jurusan, and S. Informasi, “Perancangan Desain User Interface / User Experience Layanan Informasi Kampus (LIK) Dengan Metode Lean User Experience (Lean UX) Pada Universitas Dr. Soetomo,” Surabaya, 2018. [Online]. Available: <http://lik.unitomo.ac.id>.
- [31] R. N. Wiwesa, “User Interface Dan User Experience Untuk Mengelola Kepuasan Pelanggan,” *Jurnal Sosial Humaniora Terapan*, vol. 3, no. 2, 2021.
- [32] N. I. Arifin, H. Tolle, and I. R. Rokhmawati, “Evaluasi dan Perancangan User interface untuk Meningkatkan User experience menggunakan Metode Human-Centered

Design dan Heuristic Evaluation pada Aplikasi Ezyschool," *urnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, vol. 3, pp. 1725–1732, 2019.

- [33] Y. P. Budistria, Sulistiowati, and J. Lemantara, "Perancangan Desain User interface/User experience Sistem Informasi Akademik Mahasiswa (SIAM) dengan Metode Lean User Experience (Lean UX) pada Universitas Wr. Supratman," *Jurnal Sistem Informasi Universitas Dinamika*, vol. 9, 2020.