E-ISSN : 2988-585X (Online)

Journal of Electronic Information System (JESII)

Volume 4 No 1 Juni 2026

DOI : 10.31848/jesii.xxxx.xxxx

Designing the User Interface of an IT Asset Management Information System using Design Thinking

Yogi Saputra[1], Agung Pratama[2], Popon Dauni[3], Novianti Indah Putri[4]

[1] Department of Informatics, Universitas Islam Negri Sunan Gunung Djati, Indonesia

[2,3,4] Department of Information System, Universitas Kebangsaan Republik Indonesia, Indonesia

Article Info

Article history:

Received May 21, 26
Revised Jun 16, 26
Accepted Jun 27, 26

Keywords:

Design Thinking
User Interface (UI)
Information Systems
Asset Management

ABSTRACT

It is crucial to create an information system, especially for asset management, to design a good user interface (UI). The purpose of this study is to test the application of the Design Thinking method in the UI design process for the IT Asset Management Information System at PT Niaga Handal Cemerlang located in Bandung City. The Design Thinking method was chosen because of its user-focused approach, which allows for the creation of a functional and easy-to-use interface. Empathy, problem definition, ideation, prototyping, and testing are the steps in this study. This study found that applying Design Thinking can improve the quality of the user interface, which impacts how efficient the company's asset management is. These results support that a user-oriented approach is crucial when building complex information systems.

Corresponding Author :

Agung Pratama,
Information Systems Study Program, Faculty of Computer Science and Information Systems, National University of the Republic of Indonesia.
Jl. Terusan Halimun No. 37 (Pelajar Pejuang 45), Bandung, Jawa Barat, Indonesia. 40614
Email: agungpratama@gmail.com

1. INTRODUCTION

Advances in information technology have encouraged organizations to manage operational data in a more structured, accurate, and accessible manner. One critical area requiring system support is IT asset management, as IT assets such as computers, laptops, printers, mobile devices, and software information must be recorded, protected, updated, and reported throughout their lifecycle. Without system information, data assets are vulnerable to duplication, inconsistency, slow data retrieval, and reporting delays. Previous studies on asset management information systems have shown that technology-based asset recording can support asset control, reporting, and decision-making processes. Furthermore, studies on UI/UX design emphasize that the success of an information system is determined not only by its functionality but also by whether users can effectively understand, access, and complete tasks through the interface [1].

PT Niaga Handal Cemerlang is a private company engaged in travel and package delivery services through Arnes Shuttle and Sadaya Express. The company operates in several cities, including Bekasi, Pancoran, Jakarta, Purwakarta, Sukabumi, Cianjur, Majalengka, Cirebon, Indramayu, Pamanukan, Jatinangor, and Bandung. Currently, the company still manages IT asset data using Microsoft Excel. This situation creates several challenges for IT Support, such as duplicate asset records, difficulty reporting to stakeholders, unstructured files, limited access for many users, and increased time required to search for asset information

as the data volume increases. These issues indicate that the company needs an IT asset information management system with an interface that can support daily user workflows [2].

Several previous studies have designed asset management information systems and UI/UX prototypes using different system development methods. However, many studies focus primarily on system functionality or technical development, while the relationship between user pain points, feature priorities, interface design decisions, and usability evaluations is not always explained in detail. This study addresses this gap by applying Design Thinking, a user-centric method to translate user problems into interface requirements and then launch a prototype using the System Usability Scale (SUS) [3].

The Design Thinking approach was chosen over the linear development method because the problems faced by PT Niaga Handal Cemerlang were not only technical asset recording issues but also usability issues related to how IT Support users search, enter, integrate, and report on asset data. The iterative stages of empathy, definition, ideation, prototyping, and testing enable interface design based on actual user needs and can be improved through feedback[4].

Therefore, this study aims to design the user interface of an IT Asset Management Information System for PT Niaga Handal Cemerlang using Design Thinking methods and disseminate the usability of the resulting prototype using SUS. The contribution of this study is the presentation of the complete design process, from user problem identification and feature ideation to prototype evaluation, within the context of enterprise IT asset management [5].

2. METHOD

This research applies the Design Thinking method, which consists of five stages:

2.1 Design Thinking

Design Thinking is a user-centered problem-solving method consisting of five main stages: Empathize, Define, Ideate, Prototype, and Test. This method aims to create innovative solutions that focus on user experiences and needs. The Empathize stage focuses on research to understand user needs and challenges. Define involves an in-depth analysis of the collected information to formulate the core problem. In the Ideate stage, brainstorming is conducted to generate various potential solutions. Prototype is the stage where an initial model of the solution is created and tested to obtain feedback. Finally, Test involves piloting the prototype with users to ensure [6].

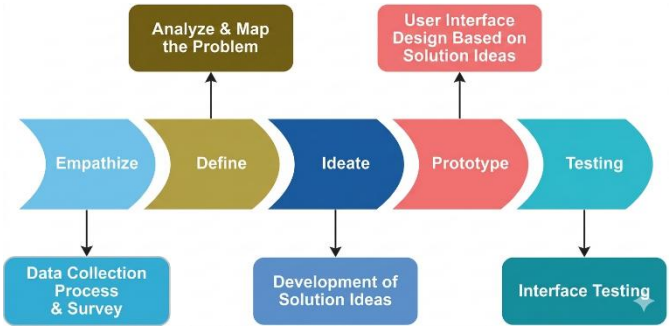

Figure 1. Design Thinking Method

with their needs. This iterative method allows developers to continuously refine solutions based on user feedback, resulting in more relevant and effective products [7].

a. Empathize

In this stage, researchers focus on understanding the problem from the user's perspective. This is done through direct observation, in-depth interviews, and direct interaction with users. The goal of this stage is to gain in-depth insight into the experiences, needs, and challenges faced by users. This understanding helps researchers view the problem from a more holistic and contextual perspective[8].

b. *Define*

After gaining insight from the Empathize stage, researchers formulate and develop a clear and focused problem statement. This stage aims to define the main problem that needs to be solved in a specific and detailed manner. This problem definition serves as the basis for designing relevant and effective solutions [8].

c. *Ideate*

In this stage, researchers generate various creative and innovative ideas to solve the defined problem. Various brainstorming methods and creative techniques are used to explore possible solutions without being limited by technical or other constraints. The goal is to generate a variety of potential alternative solutions [9].

d. *Prototype*

The ideas selected from the Ideate stage are then realized in the form of a simple prototype. This prototype is an initial representation of the designed solution, which can be a physical model, mockup, or digital simulation. This stage allows researchers to test and evaluate ideas in a more concrete and practical form[10].

e. *Testing*

The prototypes created are tested by users to obtain constructive feedback. This testing aims to evaluate the effectiveness, functionality, and user acceptance of the solution. Feedback from this stage is used to iterate and refine the prototype, so that the final solution is more aligned with user needs and expectations.
By following these Design Thinking stages, researchers aim to develop solutions that are not only technically effective but also oriented towards user needs and experience. This allows the resulting solution to adapt to changing needs and provide relevant and useful innovations [11].

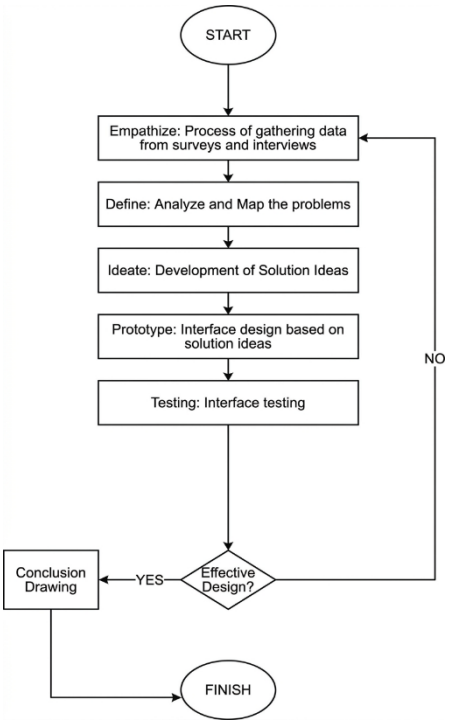

Figure 2. Design Thinking Flow

Figure 2 illustrates the Design Thinking process flow, starting with the Empathize stage, where data is collected through surveys and interviews to understand user needs and problems. This stage is followed by Define, where key problems are identified and defined. In the Ideate stage, various potential solutions are generated, and then in the Prototype stage, an initial model of the solution is created and tested in the Testing stage. User feedback is used to evaluate the effectiveness of the design. If the design is effective, the project

proceeds to completion; if not, revisions are made by repeating the process until the best solution is found. This approach involves the active role of users to ensure the developed solution meets their needs[12].

2.2 System Usability Scale

The System Usability Scale (SUS) is a tool used to measure the ease of use of a system from a user's perspective. Developed by John Brooke in 1986, the SUS has become the standard in assessing usability due to its ease of use and the resulting score from 0 to 100. Other advantages of the SUS are its ease of use, lack of complex calculations, free of charge, and validity and reliability even with small samples. The SUS calculation uses a five-point Likert scale, where respondents provide reviews of ten statements based on their personal opinions [13].

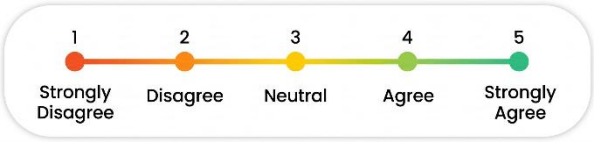

Figure 3. Likert Scale Points

Each statement item has a contribution score. Each item's contribution score ranges from 0 to 4. For items 1, 3, 5, 7, and 9 (odd numbers), the contribution score is the scale position minus 1. For items 2, 4, 6, 8, and 10 (even numbers), the contribution score is 5 minus the scale position. Multiply the sum of the contribution scores by 2.5 to obtain the overall system usability score. The SUS score ranges from 0 to 100 [14]. The following is the formula for calculating the SUS score.

a. For each odd-numbered question, subtract 1 from the score.
(Odd question score = respondent's rating – 1)

b. For each even-numbered question, subtract 5 from the score.
(Even question score = 5 – respondent's rating)

c. Then, add up all the scores for each question per respondent and multiply the result by 2.5.
(Score 1 + score 2 + ⋯ + score 10) × 2.5 = Respondent's score

d. After calculating each respondent's score, all scores are added together and divided by the number of respondents to obtain the System Usability Scale (SUS) score.

$$\text{SUS Score} = \frac{\text{Total sum of respondents' scores}}{\text{Number of respondents}}$$

The System Usability Scale (SUS) is used as an evaluation method to assess the usability of a product or system based on subjective user perceptions, by measuring effectiveness, efficiency, and satisfaction. The SUS provides results indicating user acceptance, where a score above 70 is considered "acceptable," a score of 90 or above is "Grade A" on the "Adjective Rating" scale, and a score above 70.4 is categorized as "good" on the "Adjective Rating." This evaluation is conducted through collecting questionnaire data from users, calculating scores, and grouping the results according to Acceptability Ranges, Grade Scales, and Adjective Ratings. Thus, the SUS provides important insights for developers to improve product quality and ensure it meets user needs.

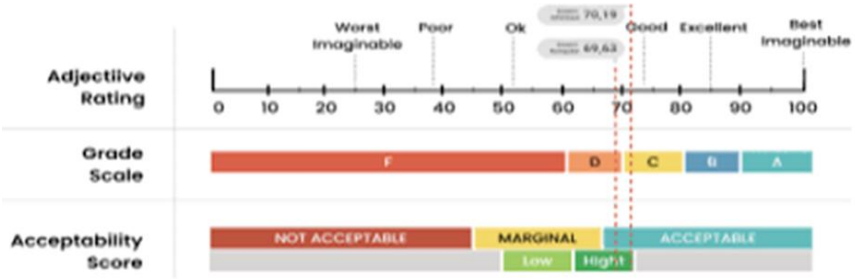

Figure 4. SUS Assessment Terms

In Figure 4, the Net Promoter Score (NPS) is a method commonly used to measure customer loyalty and satisfaction. This measurement is based on the question, "How likely is it that a product or service will be recommended to others?" [15].

3. RESULT AND DISCUSSION

In the Empathize stage, researchers collected data used to define the problem in IT asset data management at PT Niaga Handal Cemerlang. At this stage, interviews were conducted with 10 potential users using a series of questions to gain insight into the processes and problems existing in the asset data management system.
This stage is crucial in the design thinking process because it ensures that the developed solution is truly relevant and useful to users. By thoroughly understanding user needs and expectations, designers can create products or services that better align with their needs and expectations, increasing the likelihood of the solution's success in the market.

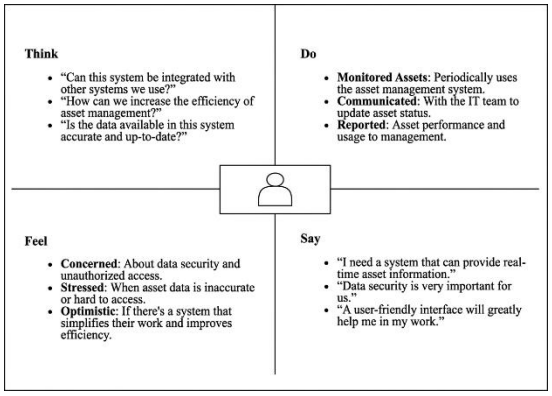

Figure 5. Resource Empathy Map

The definition phase synthesizes the findings into the following problem statement: IT support at PT Niaga Handal Cemerlang requires a centralized IT asset management interface that can simplify the input, search, update, monitor, and report of asset data, while reducing the risk of duplication and unstructured data. Based on this problem statement, the key user needs are defined as: (1) real-time or up-to-date asset information, (2) asset search based on type, location, status, and other relevant attributes, (3) structured asset registration and update forms, (4) dashboard visualization for asset categories and status, (5) monitoring of device and license information, and (6) reporting support for stakeholders.

Figure 5 illustrates the data collected, including observations, interviews, surveys, and an empathy map from key users at PT Niaga Handal Cemerlang. Based on the analysis, several needs were identified that needed to be addressed, including real-time IT asset management, data security, ease of system access, how to streamline IT asset management, and integration with other systems.
The information synthesis stage combined all data obtained from direct observation, in-depth interviews, and field research. This data was analysed to identify patterns and key insights that could help define the primary problems faced by users. Several key issues with the current system were identified, including a slow system that did not provide real-time information, difficult to access asset data, an unfriendly interface, suboptimal data security, and difficulties integrating with other systems used by the company.

The ideation phase generated several feature ideas and then prioritized them based on their relevance to user problems. Asset Search was chosen because users needed to quickly find asset information without opening multiple Excel files. Asset Management was chosen because users needed a centralized function to register new assets, update asset information, and track asset status. Performance Monitoring was chosen because IT Support needed to monitor device health, license availability, and asset usage to support decision-making. Dashboard Visualization was chosen to provide users with a quick overview of asset categories and key metrics. Notification or information dissemination features were proposed to help communicate asset status or maintenance information to relevant users. Thus, the mind map not only shows the system flow but also explains why each feature is necessary to solve a specific user problem.

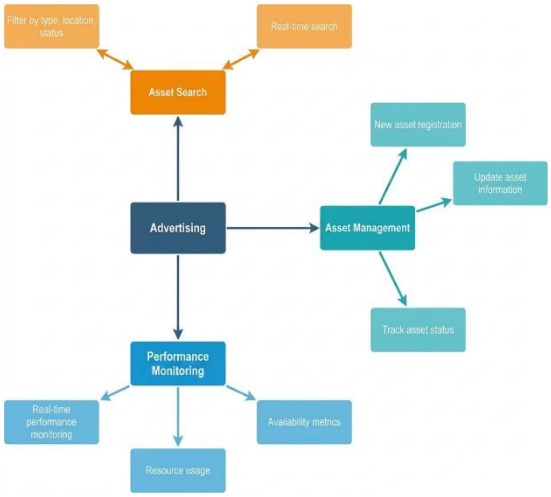

Figure 6. Asset Management Information System Flow

Figure 6 illustrates the feature format of the proposed IT Asset Management Information System. This mind map not only depicts the system flow but also explains the rationale behind each feature selected based on user needs identified in the empathy and definition stages. The Asset Search feature is needed to help IT Support quickly find asset data using filters such as asset type, location, status, and serial number, as the previous Excel-based record-keeping process made data retrieval slow and inefficient. The Asset Management feature is needed to support new asset registration, asset information updates, and asset status tracking in the target system, thereby reducing the risk of data duplication and inconsistency. The Performance Monitoring feature is needed to help users monitor asset availability, device condition, license usage, and resource utilization so that reporting to stakeholders can be done more systematically. In addition, an information dissemination or notification feature is proposed to support communication regarding asset updates, status maintenance, and critical asset-related information. Therefore, each feature in the mind map was selected not only as part of the system flow but also as a response to specific issues identified in the current IT asset management process at PT Niaga Handal Cemerlang.

The selected ideas were implemented into a Figma prototype. The login page serves as the entry point to the system and uses a simple form structure to quickly access the application. The dashboard provides asset categories, statistics, and visual information to help users understand the overall condition of assets. The asset list page provides search, filtering, and action buttons so users can efficiently find, add, edit, or delete asset data. The asset input page provides structured fields for recording asset details such as name, status, type, manufacturer, model, serial number, location, and other relevant information. The prototype also includes license management and device monitoring pages to support broader IT asset control. Overall, this prototype translates user requirements from the definition stage into interface components that support asset recording, monitoring, and reporting activities.

Figure 7. Prototype Testing

Figure 7 shows a prototype created using the Figma application. This was achieved by connecting existing buttons and menus to create a functional workflow. This page displays the splash screen, or homepage

of the application, where the start button is located. The user interface testing process using Figma demonstrates the application's user flow from the login page to various functional pages such as the dashboard, license management, and device monitoring.
System usability was measured using the System Usability Scale (SUS) method with a Likert scale of 1–5, ranging from "Strongly Disagree" to "Strongly Agree." Respondents were asked to rate 10 questions related to interface appearance, ease of use, navigation, design consistency, and user comfort in using the system.

3.1. User Interface Display Results

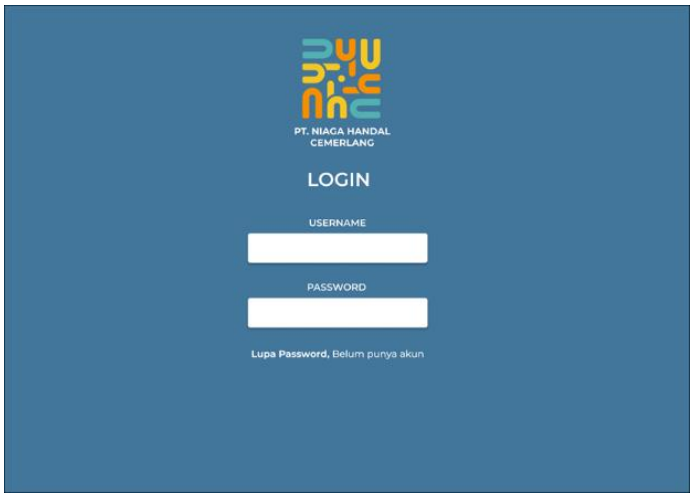

Figure 8. Login Page Results

The login page UI display on the PT. Niaga Handal Cemerlang asset management information system application functions as the main gateway for users to access various features in the system. This UI displays the company logo at the top as a visual identity, followed by a large title that says "LOGIN" to guide users. In the main section there is a login form consisting of username and password fields, as well as a button to enter the system. The UI design of this page is simple yet functional, making it easy for users to access application services quickly and efficiently.

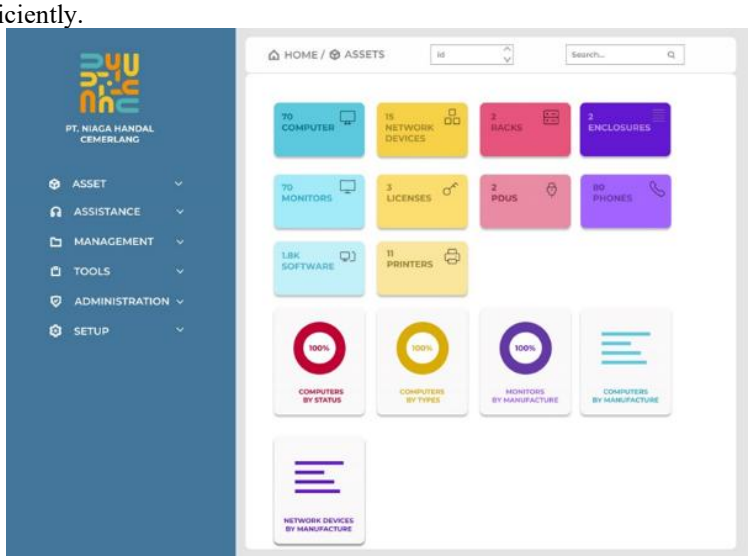

Figure 9. Home Page / Dashboard

The Asset Management Information System Dashboard of PT. Niaga Handal Cemerlang displays various categories of company assets with main elements such as Left Side Navigation which functions as a menu to access various features and pages in the system, the Main Content Section which presents information

about assets being managed, and Statistics and Graphs which display visual data in the form of graphs and statistics to provide an overview of the overall asset status.

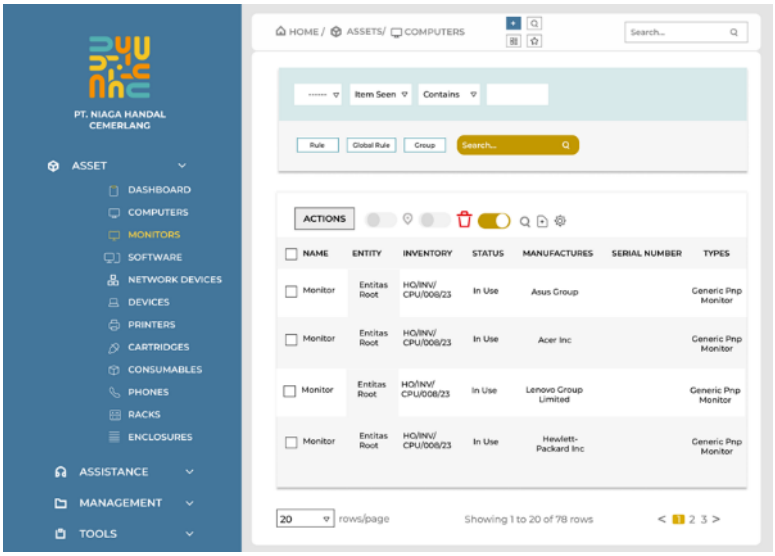

Figure 10. User interface page

The user interface (UI) of PT. Niaga Handal Cemerlang's asset management system page consists of several important elements that support efficient asset management. At the top, there is a header and navigation that includes a logo and menu for quick access to various features. The main content displays important information related to assets, such as an asset list or other details. Filters and searches make it easy for users to filter data or search for specific assets. There are also action and action features that allow users to add, edit, or delete asset data. Finally, status and pagination display the current status and provide navigation between pages for viewing more data. This interface is designed to allow users to manage asset data easily and intuitively.

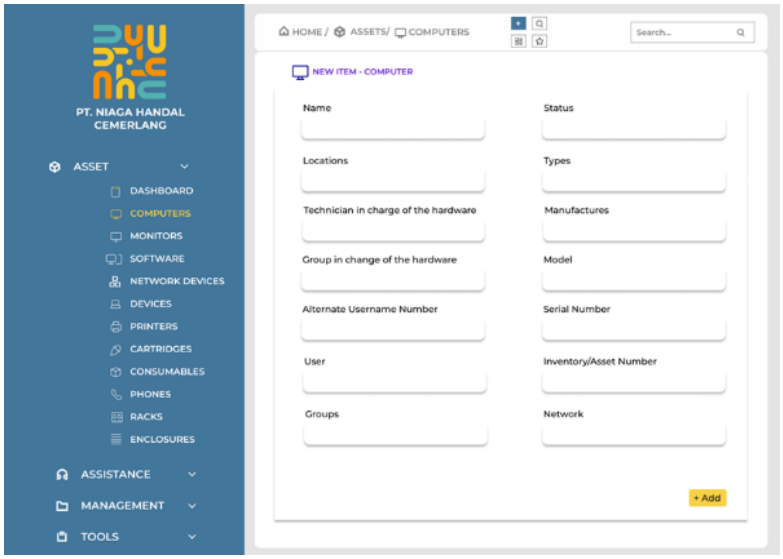

Figure 11. User data input page

The user data input page display on the PT. Niaga Handal Cemerlan g asset management system is designed to make it easier for users to add new asset data, especially computers. This page consists of several important elements, namely the header and navigation that contain logos and menus for quick access to various features, a data input form that contains columns for entering detailed information about the asset, such as the type, specifications, and condition of the asset, as well as action buttons that allow users to save or cancel the data input process. The design of this page focuses on the ease and speed of entering asset data into the system.

3.2. Testing Results

Table 1. Obtaining SUS test results

Calculated Score										Total	Final Value (x 2.5)
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
3	3	4	2	3	2	3	3	3	2	28	70
4	2	3	3	3	2	4	2	2	2	26	65
4	4	3	3	2	2	2	3	3	2	28	70
4	3	3	2	3	3	3	2	3	2	28	70
4	3	4	3	3	2	3	4	3	3	32	80
4	2	3	3	3	3	3	2	3	2	28	70
4	2	2	3	3	4	4	3	3	3	31	77
4	3	3	1	4	2	3	4	3	1	28	70
Average Score (Final Result)											70

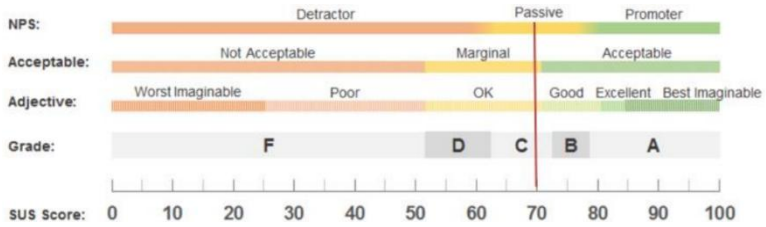

Figure 12. SUS Test Presentation Results

In the testing phase, the prototype was evaluated using the System Usability Scale (SUS). The evaluation involved 10 respondents representing potential users of the IT Asset Management Information System. Respondents consisted of users directly or indirectly involved in IT asset recording, asset monitoring, and reporting activities at PT Niaga Handal Cemerlang. This user profile was selected because these respondents were considered familiar with the current asset management process and able to provide relevant feedback on the usability of the proposed interface. Respondents rated 10 SUS statements using a five-point Likert scale, ranging from strongly disagree to strongly agree.

Usability evaluation using the System Usability Scale yielded an average score of 70. This result indicates that the proposed interface is acceptable, but still at a lower acceptable level and falls within Grade C. Therefore, the prototype cannot be considered fully optimal. Several improvements are still needed, particularly in navigation consistency, form efficiency, dashboard information prioritization, visual hierarchy, and system feedback. The results of the study indicate that Design Thinking can help translate user problems into relevant interface features, while the SUS evaluation provides input for further design iterations. Future research should involve more respondents, conduct usability comparisons before and after the redesign, and continue the prototype into a functional web-based or mobile application.

4. CONCLUSION

This study designed the user interface of the IT Asset Management Information System for PT Niaga Handal Cemerlang using the Design Thinking method. The empathy phase revealed that the existing Excel-based asset management process resulted in data duplication, unstructured reporting, limited multi-user access, and difficulty in locating asset information. The definition phase identified the primary problem as the need for a concise, user-friendly, and workflow-oriented asset management interface. The ideation phase generated priority features such as asset search, asset registration, asset status tracking, dashboard visualization, license management, and device monitoring. These ideas were then implemented into a Figma prototype consisting of a login page, dashboard, asset list, asset input, license management, and monitoring.

Usability testing using the SUS resulted in an average score of 70. This score indicates that the prototype is acceptable, but still at a lower acceptable level and a Grade C category. Therefore, the interface cannot be considered optimal. Several improvements are needed, particularly in navigation consistency, form efficiency, visual hierarchy, dashboard prioritization, and feedback messages. The findings suggest that Design Thinking is useful for connecting user problems to interface design decisions, while SUS helps identify the

need for further iteration. Future research should involve more respondents, compare usability before and after the redesign, and further develop the prototype into a functional web- or mobile-based system that can improve effectiveness, efficiency, and user satisfaction in real-world situations.

REFERENCES

[1] R. Fauzan, V. Y. Pamungkas, and J. C. Wibawa, "Information System for Asset Management," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 662, no. 2, 2019, doi: 10.1088/1757-899X/662/2/022020.

[2] A. Mursyidah, I. Aknuranda, and H. M. Az-Zahra, "Perancangan Antarmuka Pengguna Sistem Informasi Prosedur Pelayanan Umum Menggunakan Metode Design Thinking (Studi Kasus: Fakultas Ilmu Komputer Universitas Brawijaya)," *J. Pengemb. Teknol. Inf. dan Ilmu Komput.*, vol. 3, no. 4, pp. 3931–3938, 2019, [Online]. Available: http://j-ptiik.ub.ac.id

[3] R. Kusumastuti, I. Ketut Kusuma Wijaya, S. Handayani Puspita Sari, and K. Mere, "The Effect of Asset Inventory and Legal Assets on Asset Optimization: Literature Review of Financial Management," *COSTING J. Econ. Bus. Account.*, vol. 7, no. 1, pp. 825–831, 2023.

[4] S. Soedewi, A. Mustikawan, and W. Swasty, "Penerapan Metode Design Pada," *J. ONLINE DESAIN Komun. Vis.*, vol. 10, no. Vol. 10 No. 2 (2022), pp. 79–96, 2022, [Online]. Available: https://ojs.unikom.ac.id/index.php/visualita/article/view/5378/3013

[5] F. B. Andhika, I. Purnamasari, and A. Rizal, "Rancang Ulang User Interface dan User Experience Aplikasi M-Tix dengan Metode Design Thinking," *J. Pendidik. Tambusai*, vol. 7, no. 2, pp. 19134–19142, 2023.

[6] N. Rösch, V. Tiberius, and S. Kraus, "Design thinking for innovation: context factors, process, and outcomes," *Eur. J. Innov. Manag.*, vol. 26, no. 7, pp. 160–176, 2023, doi: 10.1108/EJIM-03-2022-0164.

[7] M. J. Narizki, R. A. Widyanto, and N. A. Prabowo, "Perancangan UI/UX Sistem Penerimaan Mahasiswa Baru Berbasis Perangkat Mobile dengan Metode Design Thinking," *J. Inf. Syst. Res.*, vol. 4, no. 4, pp. 1127–1135, 2023, doi: 10.47065/josh.v4i4.3652.

[8] I. B. Karo Sekali, C. E. J. . Montolalu, and S. A. Widiana, "Perancangan UI/UX Aplikasi Mobile Produk Fashion Pria pada Toko Celcius di Kota Manado Menggunakan Design Thinking," *J. Ilm. Inform. dan Ilmu Komput.*, vol. 2, no. 2, pp. 53–64, 2023, doi: 10.58602/jima-ilkom.v2i2.17.

[9] D. Haryuda, M. Asfi, and R. Fahrudin, "Perancangan UI/UX Menggunakan Metode Design Thinking Berbasis Web Pada Laportea Company," *J. Ilm. Teknol. Infomasi Terap.*, vol. 8, no. 1, pp. 111–117, 2021, doi: 10.33197/jitter.vol8.iss1.2021.730.

[10] I. Darmawan, M. S. Anwar, A. Rahmatulloh, and H. Sulastri, "Design Thinking Approach for User Interface Design and User Experience on Campus Academic Information Systems," *Int. J. Informatics Vis.*, vol. 6, no. 2, pp. 327–334, 2022, doi: 10.30630/joiv.6.2.997.

[11] H. Yohnes Madawara, P. Fiodinggo Tanaem, and D. Hosanna Bangkalang, "Perancangan Ui/Ux Aplikasi Ktm MultifungsiMenggunakan Metode Design Thinking," *J. Pendidik. Teknol. Inf.*, vol. 5, no. 2, pp. 111–125, 2022.

[12] O. D. Alao, E. A. Priscilla, R. C. Amanze, S. O. Kuyoro, and A. O. Adebayo, "User-Centered/User Experience Uc/Ux Design Thinking Approach for Designing a University Information Management System," *Ing. des Syst. d'Information*, vol. 27, no. 4, pp. 577–590, 2022, doi: 10.18280/isi.270407.

[13] L. Berke, M. Huenerfauth, and K. Patel, "Design and psychometric evaluation of American sign language translations of usability questionnaires," *ACM Trans. Access. Comput.*, vol. 12, no. 2, 2019, doi: 10.1145/3314205.

[14] E. Kurniawan, N. Nofriadi, and A. Nata, "Application of the System Usability Scale (SUS) in Assessing the Usability of the Website for the Study Program at STMIK Royal," *J. Sci. Soc. Res.*, vol. 5, no. 1, p. 43, 2022.

[15] N. I. Rhamdani, "Net Promoter Score sebagai Tolok Ukur Ketercapaian Customer Loyalty Peserta Pekerja Penerima Upah Badan Usaha," *J. Jaminan Kesehat. Nas.*, vol. 1, no. 2, pp. 123–135, 2021, doi: 10.53756/jjkn.v1i2.34.