



Navigation Interconnectivity Improvement to Increase User Satisfaction of Web-based Asset Management Services using the System Usability Scale (SUS)

Fajar Rizqy Anugrah Illahi¹, Wegig Murwonugroho¹,
Charles Soegiarto Marpaung², Pongky Adhi Purnama³,
Daniel Marlasputra Simbolon³ & Ariani^{2*}

¹Master of Product Design Study Program, Faculty of Art and Design, Universitas Trisakti, Jl. Kyai Tapa No. 1, Jakarta 11440, Indonesia

²Product Design Study Program, Faculty of Art and Design, Universitas Trisakti, Jl. Kyai Tapa No. 1, Jakarta 11440, Indonesia

³Photography Study Program, Faculty of Art and Design, Universitas Trisakti, Jl. Kyai Tapa No. 1, Jakarta 11440, Indonesia

*E-mail: arianirachman@trisakti.ac.id

Abstract. This study evaluated and redesigned navigation interconnectivity within the Toms Aset asset management system in a public-sector context. Initial usability testing involving six participants from diverse professional backgrounds revealed several navigation inefficiencies, reflected in an average System Usability Scale (SUS) score of 58.75, indicating below average usability. In response, a user-centered redesign was developed with a focus on improving consistency, readability, clarity, interactive affordance, efficiency, and structural coherence. The redesigned interface was then re-evaluated through task-based usability testing and SUS assessment with five participants. The results showed a substantial improvement, with the SUS score increasing to 78, surpassing the global benchmark average of 68. These findings underline the importance of well-structured and interconnected navigation in enhancing user satisfaction, particularly in data intensive asset management systems. This study contributes to ongoing discussions on usability driven visual interface refinement in semi-public digital environments and offers a practical framework for iterative navigation optimization in complex information systems.

Keywords: *asset management; navigation; system usability scale (SUS); user interface; user experience.*

1 Introduction

Advances in information technology have driven digital transformation in various sectors, one of which is in asset management. Digitalization has transformed asset management beyond efficiency, emphasizing transparency and measurable organizational impact [1]. According to data from [2], with the global market value of asset management reaching USD 373.7 billion by 2023 and significant

Received March 1st, 2025, Revised March 8th, 2026, Accepted for publication September 1st, 2026.

Copyright © 2026 Published by ITB Institute for Research and Community Services, ISSN: 2337-5795,

DOI: 10.5614/j.vad.2026.18.1.2

growth projected until 2030, the presence of effective digital solutions is increasingly inevitable. This reflects the importance of developing efficient and interactive navigation systems to support broader digitization in various sectors.

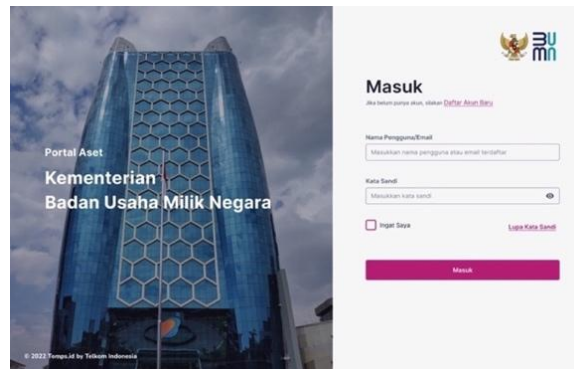


Figure 1 Login page [3].

Figure 1 above shows the login page that appears before users can access the Toms Aset asset management service, displaying the Ministry of State-Owned Enterprises (KBUMN). After successfully logging in by entering their user name/email and password, the user will be directed to the list of assets page, as shown in Figure 2.

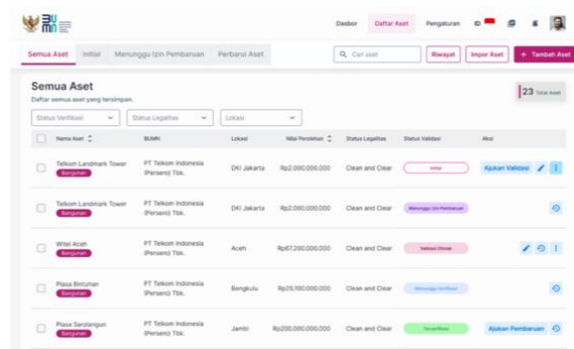


Figure 2 List of Assets page [3].

Toms Aset is an asset management platform in the form of a website that was developed by PT Toms Indonesia, which is a subsidiary of PT Telkom Indonesia Tbk. Designed to simplify and facilitate asset management for companies under the auspices of the Ministry of State-Owned Enterprises (KBUMN) as well as other companies, Toms Aset offers a promising solution. The platform aims to support more efficient, transparent, and accountable asset management practices. Toms Aset is presumed to provide an effective solution for streamlining asset management processes, however, many companies, especially those from outside

the scope of KBUMN, complain of an unsatisfactory user experience. They find it difficult to navigate the website's interface, which is insufficiently interactive and consistent, which causes them to be hampered in exploring various important features provided. One of the main problems is that the navigation is difficult to understand, which makes it hard for users to find the information they need or to complete tasks [4]. This lowers the users' trust in the asset management service website, which was originally proposed to be a tool that would improve the efficiency of asset management.

Ease of navigation and consistent interface design are key factors in creating an optimal user experience. A website that is difficult to use can trigger dissatisfaction in users, which in turn increases the bounce rate, which is the condition where users leave the website without further interaction [5]. This situation challenges the Tomps design team seriously, as this can decrease productivity and hinder the adoption of technologies that are actually designed to improve performance and transparency [6].

Evaluation of user experiences with the asset management services on the Tomps Aset website revealed a considerable gap related to the navigation design and the interface interconnectivity. Not many studies have examined how a well-connected navigation design can help users explore the content of a website to the fullest. In this context, it is important to explore aspects such as consistency, readability, clarity, and navigation efficiency [7]. This research aimed to address these gaps by providing a more interactive and accessible design solution, referring to key design principles that emphasize user satisfaction outside the KBUMN environment when conducting small scale usability testing (UT) [8]. Usability testing involved six participants from diverse professional backgrounds, including executive, operational, and independent users, to capture various real-world perspectives on asset management practices [9]. This selection ensured balanced feedback on the system's performance while reflecting different interaction patterns and decision-making contexts.

Without improvement, navigation issues may reduce system credibility and sustained use. Effective interface design therefore must ensure structural coherence and navigational clarity beyond visual aesthetics [10-11]. The study particularly emphasized external users outside the Ministry's institutional framework to reflect broader digital literacy levels [12]. Its novelty lies in integrating a public-sector context, a two-stage evaluative approach, and a user-diversity-driven design strategy—an intersection that remains underexplored in the literature [13].

User segmentation was conducted prior to redesign, categorizing the participants into two primary groups as shown in Table 1.

Table 1 User persona summary.

User Profile	Primary Role	Key Needs	Design Focus
Director	Monitoring asset operations and making strategic decisions.	Quick access to summarized visual information and simplified navigation.	Clear visual hierarchy, high readability, and concise information presentation.
Operational staff	Recording and managing asset data to ensure synchronization within the system dashboard.	Easy data input, consistent interface layout, and structured navigation.	Simplified form completion and well-organized navigation structure.

After identifying the two primary user groups, the study developed user personas to represent their characteristics, needs, and behavioral patterns, supporting a more focused user-centered design approach [14-15]. This process positioned user needs as the core reference throughout interface development, ensuring contextual relevance in digital asset management [12,16].

Given the need to improve the usability beyond the KBUMN environment, navigation refinement was expected to enhance efficiency, transparency, and broader adoption in the private sector. While many usability studies assess overall interface performance, few operationalize navigation interconnectivity as a measurable structural variable in data-intensive public-sector systems. By applying a two-stage evaluative framework and emphasizing navigation coherence as a design construct, this study contributes to both applied usability practice and visual interface research. Referring to the background as explained above, a number of research questions arose related to the problem, including: What is the level of usability of the navigation on the Toms Aset asset management service website in supporting user satisfaction, based on the evaluation results using the System Usability Scale?

2 Methodology

This study employed usability testing (UT) methods to evaluate the usability and identify navigation weaknesses of the Toms Aset website as it is currently used by the Ministry of State-Owned Enterprises (KBUMN). Usability testing was selected as the primary evaluation approach because it enables direct observation of how users interact with the website while completing real tasks [17]. Unlike SEQ, which captures perceived ease of use for a single task, or UEQ, which focuses on broader experiential and hedonic qualities, usability testing provides deeper insight into actual user behavior [18]. It allows researchers to identify navigation breakdowns, task inefficiencies, and structural inconsistencies within the interface [19]. Given the functional complexity of an asset management website, understanding how users navigate information, interpret visual hierarchy, and complete operational processes is essential [20]. Usability testing

offers diagnostic value by revealing where users encounter confusion, hesitation, or erroneous insights that perception-based questionnaires alone may not fully capture [21]. This approach is particularly relevant in evaluating pre- and post-redesign conditions, as it enables measurable comparison of task performance and usability improvements. Therefore, usability testing was considered more appropriate for this study, as it supports practical design refinement and provides actionable evidence for improving interface consistency and operational efficiency within a public-sector digital system [13]. The testing aims to provide deeper insight into the user experience as well as support further development so that the service can be expanded and used by companies outside the scope of KBUMN.

The usability testing evaluation of the Toms Aset asset management website employed a quantitative usability testing approach, aimed at collecting measurable indicators of user satisfaction and perceived ease of use [11]. This method focuses on assessing the usability performance of a digital service through structured evaluation, enabling the identification of strengths and areas for improvement based on user-centered metrics [8]. As part of the improvement effort, this research also applied the System Usability Scale method to measure the level of satisfaction and ease of use of the user interface design (UI). This was derived from research conducted by [22], which suggests that a good interface design must be easy to use and attractive, where the user experience includes user perceptions and responses to products. Therefore, optimizing the interaction of the user with the Toms Aset website is the key to increasing satisfaction levels. Thus, the results of this research are expected to provide recommendations for a more interactive and efficient design, which in turn can increase user satisfaction from various sectors, create a more user-friendly asset management service website on Toms Aset products, and encourage wider adoption of the technology.

Usability testing generally follows a structured framework widely referenced in the human–computer interaction (HCI) literature [11]. Usability testing is designed to evaluate how real users interact with a system while performing specific tasks [6]. The process typically involves several key stages, including planning and preparation, task execution, systematic observation of user behavior, and analysis of findings to identify usability issues and inform design improvements [23].

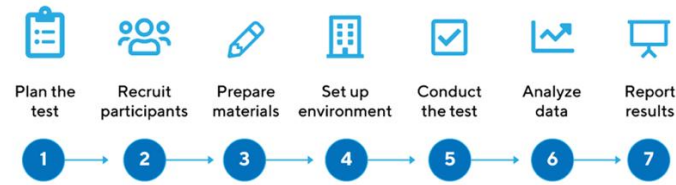


Figure 3 The usability testing process [17].

The usability testing process generally consists of seven structured stages (Figure 3) designed to ensure systematic evaluation and reliable findings [17]:

- 1) Plan the Test: Define evaluation objectives, research questions, usability metrics, and study scope to align testing with research goals.
- 2) Recruit Participants: Select representative users based on predefined criteria to ensure relevance to real-world contexts.
- 3) Prepare Materials: Develop task scenarios, scripts, and evaluation instruments that reflect realistic use without introducing bias.
- 4) Set Up the Environment: Configure a controlled testing setting, including interface preparation and observation tools.
- 5) Conduct the Test: Observe participants completing predefined tasks while collecting performance and feedback data.
- 6) Analyze Data: Examine quantitative and qualitative results to identify usability issues and interaction challenges.
- 7) Report Results: Document findings and provide evidence-based recommendations to support iterative design improvement.

Data collection was conducted using a SUS questionnaire, which consisted of ten questions with a five-point Likert scale, in which users as respondents were asked to rate the usability aspects of the Toms Aset service, including ease of use, efficiency, design consistency, and interface satisfaction.

Table 2 Participant categories and selection rationale.

Participant Profile	Selection Criteria	Rationale
Board of Directors Property and Real Estate (R1)	Involved in strategic asset related decision making, including investment, acquisition, and asset disposition.	Represents executive level perspective emphasizing analytical evaluation, data reliability, and information accessibility within the system.
Facility Management (R2)	Professional engaged in operational asset management and property administration.	Provides insights from frequent system usage and practical asset management processes.

Participant Profile	Selection Criteria	Rationale
General Affair (R3)	User with varying levels of technological proficiency.	Ensures evaluation across different digital literacy levels and assesses usability for non-technical users.
Entrepreneur (Transition from Manual System) (R4)	Previously managed assets using manual systems such as spreadsheets and written records.	Captures comparative insight between traditional asset management methods and digital platform adoption.
Experienced Entrepreneur in Asset Management (R5)	Has experience managing land, buildings, or other assets in personal or institutional contexts.	Contributes informed expectations regarding system functionality and operational efficiency.
Multi-Platform User (R6)	Regularly uses desktop and mobile devices.	Supports evaluation of responsive design and consistency of user experience across platforms.

This questionnaire was offered online to facilitate data collection from the six participants (Table 2). The following is an example of a System Usability Scale questionnaire [17]:

- 1) I think I will use this website frequently. (Positive statement sentence)
- 2) I find this website too complicated. (Negative statement sentence)
- 3) I find this website easy to use. (Positive statement sentence)
- 4) I need help from someone or a technician to use this website. (Negative statement sentence)
- 5) The features of this website seem to be well-integrated.
- 6) I feel like there are too many inconsistencies on this website.
- 7) I imagine most people will learn to use this website very quickly.
- 8) I find this website very inconvenient to use.
- 9) I feel confident using this website.
- 10) I need to learn many things before I can use this website properly.

When applying the System Usability Scale method, the questions need to be designed to evaluate the user experience of a website. Some of the aspects measured include how often users are likely to use the website, the level of complexity and ease of use, the need for technical assistance, the consistency of features, and the user's confidence in using the website. In addition, SUS also assesses users' perceptions of the ease of learning to use this website as well as potential barriers they experience. Each question is answered using a Likert scale from 1 (meaning the user strongly disagrees) to 5 (meaning the user strongly agrees), resulting in a score that reflects the overall usability of the website [17].

After getting the response from each of the participants in the form of a set of numerical values, the SUS score is calculated with the following steps [18]:

- 1) Odd Statements: For example, for questions number 1, 3, 5, 7, 9, reduce the response value by 1 to get the score. So, if the respondent gives a response value of 4, the calculated score is $4 - 1 = 3$.
- 2) Even Statement: As with numbers 2, 4, 6, 8, 10, subtract 5 from the response value given by the user to get the score. If the respondent scores 4 on an even question, the calculated score is $5 - 4 = 1$.
- 3) Score summation: Add up all the scores obtained from odd statements and even questions.
- 4) Final score: To get the final score, the total of the sum of the scores obtained needs to be multiplied by 2.5. The final score ranges from 0 to 100.

For example, the scores from each statement are summed up, producing a total raw score of 22. This score is then multiplied by 2.5, which results in a final SUS value of 55. This value represents the level of usability of the website being evaluated. The process helps describe users' perceptions regarding complexity, ease of use, feature integration, website consistency, and their level of confidence in using the website [17]. Through the method described, each user generates a final SUS score in the range of 0 to 100, which directly reflects their experience with the website. The higher the SUS score, the more positive the perceived user experience. Reference [18] revealed that scores below 50 reflect a poor experience, scores between 50 to 68 indicate average performance, while scores above 68 depict good to excellent quality. This interpretation provides a clear emotional picture, where users with high scores tend to feel comfortable, confident, and satisfied with the website, while lower scores indicate frustration and highlight the urgent need for improvement. To ensure methodological rigor, the study applied structured task-based scenarios reflecting real asset management activities [6], along with standardized procedures across the pre- and post-redesign stages to minimize bias [13]. Ecological validity was supported by involving participants from diverse professional backgrounds. Reliability was maintained through consistent evaluation criteria and the use of the validated SUS instrument [24]. Data triangulation combining the SUS scores and the observational findings further strengthened the credibility of the results [21].

To obtain more representative results, participants were selected purposively by involving users from outside the KBUMN who had relevant needs but were not directly tied to the institution. This approach is in line with principles in usability testing research that emphasize the importance of engaging diverse audiences to gain a more objective perspective [23]. This testing provided valuable insights

into the user experience from a wider sector, ensuring the research results were more relevant in evaluating the interface design of the Asset Tomsps. Based on Reference [11], by involving diverse user backgrounds, this usability testing was expected to highlight both the shortcomings and strengths of the Tomsps Asset asset management service website, which would provide a more in-depth and diverse view of usability testing. As a result, this research provides a deeper understanding of the usability of the asset management service on the Tomsps Asset website from users outside of KBUMN while offering valuable insight for future development and improvement.

This study acknowledges several methodological limitations. First, the usability evaluation involved a small sample of six participants. Although formative usability research suggests that five users can identify most interface issues [6], such a sample supports diagnostic insight rather than statistical generalization. Future studies with larger samples would enhance external validity [25]. Second, the evaluation was conducted in a structured testing environment, reflecting controlled task performance rather than long-term or real-world organizational use [12,21]. Further research incorporating longitudinal and real-world deployment analysis is recommended to strengthen empirical robustness [26]. The second-stage usability testing employed a within-subject framework, in which the same participants evaluated both the original and redesigned interfaces, enabling direct comparison of usability improvement.

3 Result & Discussion

This research evaluated the effectiveness of navigation and consistency of the user interface design of the Tomsps Asset asset management service website using the System Usability Scale approach with an average SUS score of 58.75. This score is lower than the global average of 68 (Figure 4), which indicates that design improvements are needed [17].



Figure 4 Terms of SUS assessment on global averages.

3.1 Evaluation of SUS Score and Task Success Rate

The completion of the SUS questionnaire and interviews in the usability testing of this research involved six respondents, who were employees who manage company assets outside the scope of the Ministry of State-Owned Enterprises (KBUMN). The inclusion of six participants aligns with established principles in usability research. Foundational studies in Human Computer Interaction suggest that small sample usability testing typically involving five to eight participants is sufficient to identify the majority of interface related usability issues during formative evaluations [7]. Nielsen's model further explains that usability problem discovery follows a diminishing returns pattern, where testing with five users can reveal approximately 80% of major usability concerns [6].

In the context of this study, the primary objective was diagnostic and design-oriented: to uncover navigation constraints and assess measurable improvements following the redesign process. Therefore, the emphasis was placed on in-depth observation, task-based interaction analysis, and iterative refinement rather than statistical generalization to a broader population [8]. Within this framework, the participation of six users was considered methodologically appropriate and sufficient to generate meaningful [13], evidence-based insight for improving the interface within its defined context of use [25].

The results of usability testing showed that some of the main tasks on the asset management service website, such as creating new assets and updating assets, had a low success rate. For example, the creation of a new asset was only successfully completed by four out of the six users (67%). The main obstacles found include the absence of a scrolling indicator on the form and information regarding a form that must be filled in but is not visible to the user. While other tasks such as viewing asset details and dashboards were completed with a 100% success rate, there were shortcomings such as some buttons not working and colors on the map dashboard not being consistent with the product.



Figure 5 Bar diagram showing the success rate of each task (Data processed by the DOA Team on November 4, 2023).

3.2 Filling Results and System Usability Scale (SUS) Data

In the usability testing, SUS data was collected from ten questions filled out by six users based on their experience using the asset management service website. The SUS results showed that the average score recorded was 58.75, which describes a less-than-optimal level of website usability. The following are the filling results of some relevant SUS questions, as shown in Table 3:

Table 3 SUS calculation results (Data processed by the DOA Team on November 4, 2023).

No	Questionnaire	Respondent					
		R1	R2	R3	R4	R5	R6
1	Q1	3	3	3	3	3	3
2	Q2	2	1	2	2	3	3
3	Q3	3	3	2	2	3	3
4	Q4	2	2	1	2	1	2
5	Q5	2	3	3	4	3	4
6	Q6	1	3	2	3	3	3
7	Q7	1	3	3	2	2	2
8	Q8	2	2	1	2	2	1
9	Q9	2	2	3	3	1	3
10	Q10	2	3	3	2	2	1
Total		20	25	23	25	23	25
Total * 2.5		50	62.5	57.5	62.5	57.5	62.5
Total * 2.5/6		58.75					

Calculating the average SUS score of the respondents was done by summing up all the scores obtained and dividing them by the number of respondents, namely six respondents. The average SUS score obtained was 58.75, as shown in Figure 6. This score reflects some challenges in the user experience, mainly related to the design of the new asset creation page, which is not interactive. This is due to the lack of notifications and explanations on each form as well as elements on the map dashboard that do not function properly, potentially reducing the ease with which users can interact with the Asset Toms website.

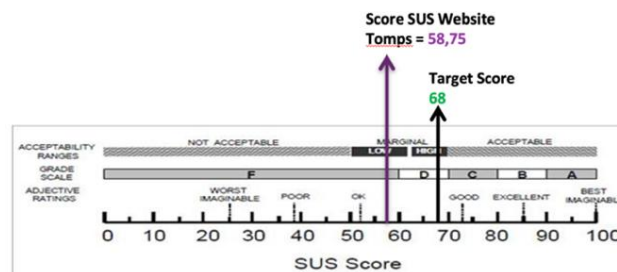


Figure 6 Comparison of Asset Toms service SUS score with the global average (Data Processed by the PASS-DOA Team on November 4, 2023).

From the scores obtained, it can be concluded that the SUS results for the Toms Aset website were in the ‘good enough’ category, which corresponds to predicate D. The calculation of the SUS average for each question was carried out using a five-point Likert scale (Table 4), where questions with odd numbers were considered positive questions, while even numbers were considered negative questions. The five-point Likert scale consisted of a value of 5 (strongly agree), 4 (agree), 3 (undecided), 2 (disagree), and 1 (strongly disagree) [9].

Table 4 SUS score calculation results.

SUS Skor	Grade	Metrics
Above 80	A	Excellent
65-80	B	Very good
65	C	Ok
50-65	D	Poor
Below 50	E	Worst imaginable

3.3 User Interface Design Analysis

This analysis discusses the comparison between the old design and the new design based on negative findings arising from inconsistencies and lack of interactive elements in the old design during usability testing with six users from outside the Ministry of State-Owned Enterprises (KBUMN). In addition, this analysis also reviews how the new design solution can improve the overall user experience. In the new design, there are design elements such as the color palette and the typography that were adjusted by Toms Aset’s own internal team.



Figure 7 Color palette of Toms Aset.

Color palette refers to a set of colors selected for use in a visual design with the aim of creating consistency and balance. According to the color theory of Johannes Itten(1888-1967), the right color selection can affect the emotional perception of users and strengthen the visual identity of a brand or product. Reference [27] adds that appropriate colors can increase the visual appeal and make it easier to recognize the overall design. In Figure 6, the Toms Aset color palette uses green with code #667085 as the main color, which was determined by the Toms design team.

Heading Title, Subtitle	Body Large Section Labels, Text Block	Body Small Footnote	Caption Large Title, Subtitle	Caption Small Title, Subtitle	Caption X-Small Title, Subtitle
Heading 1	Body Large - Regular Body Large - Semibold	Body Small - Regular Body Small - Semibold	Caption Large - Regular Caption Large - Semibold	Caption Small - Regular Caption Small - Semibold	Caption X-Small - Regular Caption X-Small - Semibold
Heading 2	Body Large - Bold	Body Small - Bold	Caption Large - Bold	Caption Small - Bold	Caption X-Small - Bold
Heading 3	Body Large - Bold	Body Small - Bold	Caption Large - Bold	Caption Small - Bold	Caption X-Small - Bold
Heading 4	Body Large - Underline	Body Small - Underline	Caption Large - Underline	Caption Small - Underline	Caption X-Small - Underline
Heading 5	Body Large - Underline Semibold	Body Small - Underline Semibold	Caption Large - Underline Semibold	Caption Small - Underline Semibold	Caption X-Small - Underline Semibold
Heading 6	Body Large - Underline Bold	Body Small - Underline Bold	Caption Large - Underline Bold	Caption Small - Underline Bold	Caption X-Small - Underline Bold

Figure 8 Typography applied to the Tomps Aset website.

Meanwhile, typography refers to the art and technique of organizing letters, numbers, and symbols to create designs that are not only aesthetically pleasing but also easy to read. Typography goes beyond font selection by involving the way these elements interact with each other to convey a clear, understandable message and support effective communication through text [28].

As shown in Figure 8, the typography applied in the Tomps Aset website uses the Inter font. The Inter typeface was selected for the interface design due to its high legibility and optimization for digital environments [29]. Designed specifically for user interfaces, Inter offers excellent readability across various screen resolutions and device sizes [29]. Its carefully engineered letterforms, generous x-height, and balanced spacing enhance clarity, particularly in dense informational contexts such as dashboards and asset management systems. From a usability perspective, typography plays a critical role in supporting visual hierarchy and cognitive processing. Inter's neutral and contemporary aesthetic minimizes visual noise while maintaining structural consistency across interface components [30,22]. This is particularly important in data-intensive systems, where users must quickly scan, interpret, and act upon information. Furthermore, Inter performs well in responsive layouts, maintaining legibility across desktop and mobile platforms. Its variable font capabilities also allow flexible weight adjustments without compromising consistency [31]. Therefore, the selection of Inter aligns with the study's objective of improving navigation clarity, interface consistency, and overall user efficiency within a complex asset management website [32].

3.3.1 Dashboard Map

Figure 9 shows the negative findings on the asset management service map interface. The total asset information, which consists of land and building assets, is not explained in detail, making it difficult for users to understand the meaning of the asset composition. The asset list is also uninformative, as it does not provide specific details about each asset, such as location, status, or value. In addition, the use of color for the pins on the map is not accompanied by a clear description or legend, causing confusion in identifying categories or types of assets based on color. The choice of color in a product should not only be based

on personal taste or feelings but should also be carefully considered in accordance with its function, considering that color has an important role in the appearance of the product [33]. These findings indicate the need to improve transparency and ease of navigation in interface design in line with [34], which emphasizes the importance of consistency and connectedness of navigation to create efficient and reliable interfaces.

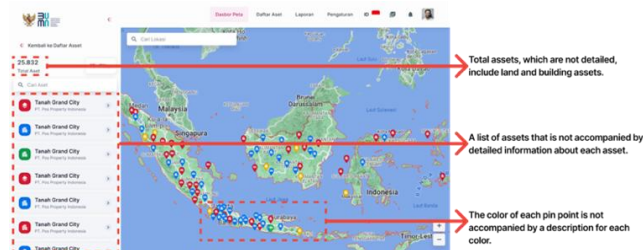


Figure 9 Negative findings on the dashboard map (Before).

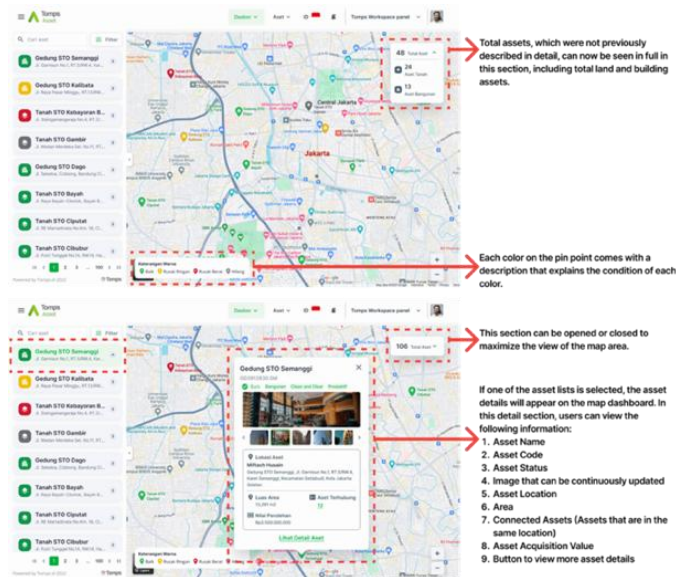


Figure 10 Improvements on the map dashboard in accordance with the negative findings (After).

The map dashboard improvements in Figure 10 show the improvements and additions of a more interactive design to the asset management service map dashboard. The asset information is now presented in more detail, including total land and building assets, providing a clear picture to the user. Each color of the pins on the map comes with a legend explaining the asset's condition, such as green meaning 'good', yellow meaning 'lightly damaged', red meaning 'severely

damaged', and gray meaning 'missing or out of custody', making visual identification easier. Sections of the interface can be hidden or displayed as needed, providing flexibility for users to maximize the view of the map. In addition, selecting an asset from the list brings up a detail panel that displays complete information, such as asset name, asset code, asset status, asset image, location, area, connected assets, acquisition value, and buttons to view more details. These features increase transparency, interactivity, and efficiency in asset navigation and management.

After clicking the 'View Asset Details' button on the previous map dashboard page, users will be directed to the Asset Details page (Figure 11). On this page, the user can see asset information, ranging from images to certificate ownership data. Furthermore, the user can view usage data and asset history, including previous user history.

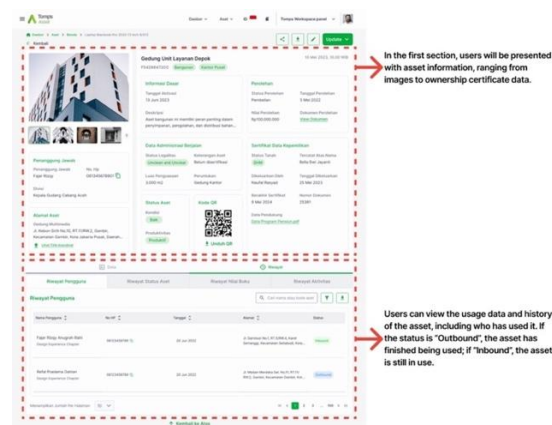


Figure 11 The Asset Details page.

3.3.2 Creating a New Asset

In the old design, users had difficulty completing the new asset creation form because they did not realize that there were additional forms that still needed to be filled out. Here are the negative findings:

- 1) No scrolling indicator
- 2) Button area is too big

The new asset creation form in the old design in Figure 12 was considered too complicated because there was no indicator to scroll down, which caused users to often miss important columns. This can be seen from the task completion score, which only reached 67%, with only four out of six users successfully completing the first task, which was to create a new asset. Figure 12 shows the old interface

design, which featured a long form without navigation guides or scroll indicators. In addition, the findings also revealed other issues, such as the area of the ‘Apply for Validation’ button being too large, which distracted users and caused them to miss important fields of the form during usability testing.

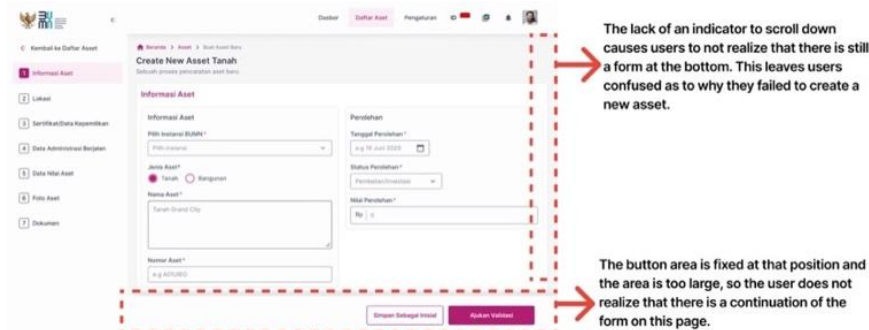


Figure 12 Negative findings on the new asset creation form in the old design.

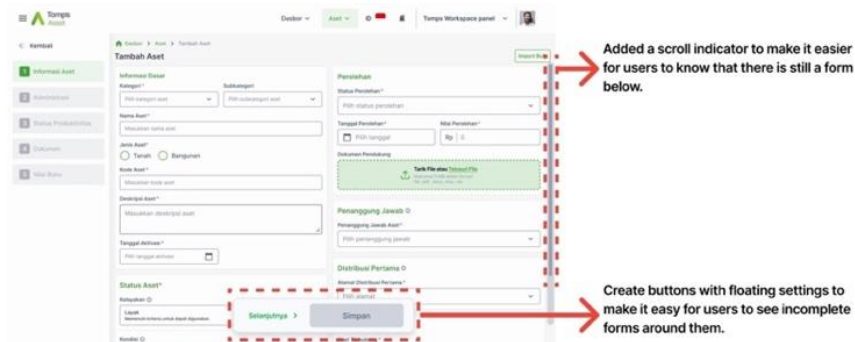


Figure 13 New design showing improvements to the new asset creation form.

The new design in Figure 13, which is the result of improvements based on the negative findings in Figure 12, includes improvements such as a clear scroll indicator and a change from fixed to floating buttons, to ensure that users complete the form correctly.

The redesign of the Add Assets page corrected some of the major flaws found previously, such as uninteractive navigation and lack of user guidance. The addition of tooltip icons with contextual information that appears when the cursor is hovered over them provides clear guidance for each form element, reducing user confusion, especially for new users (Figure 14). This design improvement is also more consistent terms of the use of colors, icons, and well-structured interface elements, making it easier to understand.

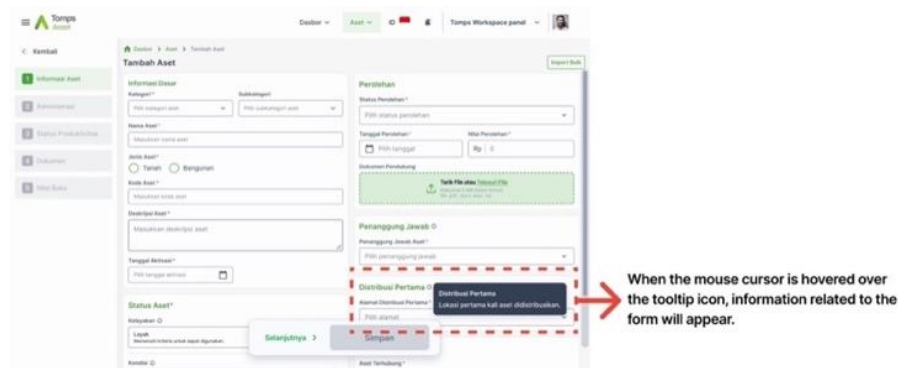


Figure 14 Information about the definition of forms.

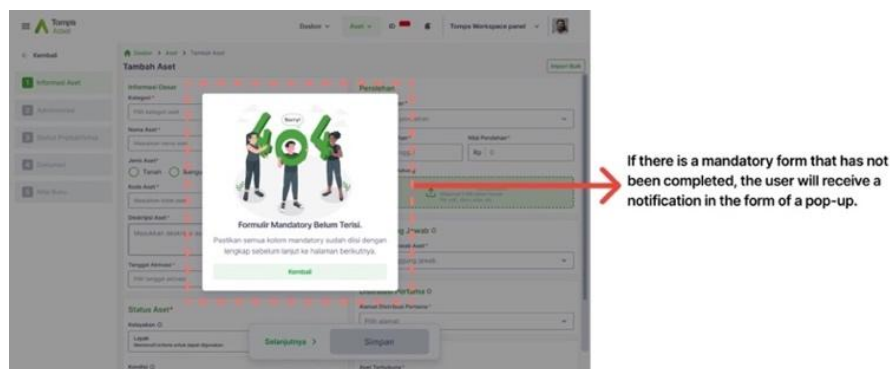


Figure 15 Notification if mandatory forms are not all filled in.

The redesigned Add Asset page in Figure 15 introduces a pop-up notification to ensure all required fields are completed before submission, addressing previous issues of limited feedback and unclear interaction. Clear messaging and simplified visual cues, including a 'Back' button, enhance navigational clarity and reduce user frustration. These improvements align with user centered design principles and usability heuristics, particularly error prevention and informative feedback [6].

Following the redesign, the interface was re-evaluated through task-based usability testing using a prototype. The participants completed core system scenarios and their performance was assessed based on task success, completion time, and interaction challenges. In addition, SUS was applied to measure perceived usability. The combined findings provide structured evidence of design improvement and inform further iterative refinement. The characteristics of the respondents involved in the redesigned usability testing are presented in Table 5.

Table 5 Respondent characteristics for the redesigned usability testing.

Category	Criteria	Rationale
BOD Finance Hotel & Resort (R1)	Experienced in corporate asset recording and monitoring processes.	Accustomed to managing large volumes of corporate assets, requiring an efficient and streamlined user experience.
Bank Finance (R2)	Responsible for asset management and reporting within corporate financial systems, particularly in validation and internal audit processes.	Financial users demand systems that are accurate, structured, and reliable due to regulatory compliance and reporting transparency requirements.
Private Sector Employee Auditor (R3)	Involved in internal and external corporate asset audit activities using available systems.	Requires comprehensive data access, structured asset change history, and system navigation that supports traceability.
Private Sector Employee Auditor (R4)	Involved in internal and external corporate asset audit activities using available systems.	Requires comprehensive data access, structured asset change history, and system navigation that supports traceability.
Private Sector Employee Auditor (R5)	Involved in internal and external corporate asset audit activities using available systems.	Requires comprehensive data access, structured asset change history, and system navigation that supports traceability.

During usability testing, structured task-based scenarios were developed to evaluate user interaction with the redesigned interface. Each scenario was derived from core system features and aligned with user goals identified in the persona analysis, simulating realistic operational contexts. This approach enabled performance-based assessment of key usability metrics, including task success, completion time, navigation clarity, and interaction efficiency. Table 6 below summarizes the testing scenarios and their objectives.

Table 6 Task Usability Testing.

Task	Objective	Scenario
1. Bulk Asset Import	To evaluate the ease of creating new assets through the bulk import feature.	Due to the large volume of asset data, adding assets individually is impractical. Participants are required to use the 'Import Asset' feature to add multiple assets simultaneously.
2. Create New Asset	To assess the ease of adding a new asset individually.	The company has recently acquired a new parcel of land as a reserve asset for a branch office. Participants are required to register this new asset into the system.

Task	Objective	Scenario
3. Access Additional Information via Tooltip	To evaluate the accessibility of contextual information within specific interface elements.	Participants are asked to identify the meaning of 'Asset Condition' within the asset status form using the tooltip feature.
4. View Asset Details	To assess the ease of retrieving detailed information about a specific asset.	Participants are instructed to locate and review detailed information regarding the asset labeled 'Branch Office Land A'.

This evaluation assessed whether participants could successfully complete assigned tasks using the redesigned Toms Aset prototype. Task performance was measured through completion success, navigation flow, and interaction efficiency to determine the interface's effectiveness in supporting goal-oriented use. The following section presents a summary of task performance outcomes from the usability testing phase.

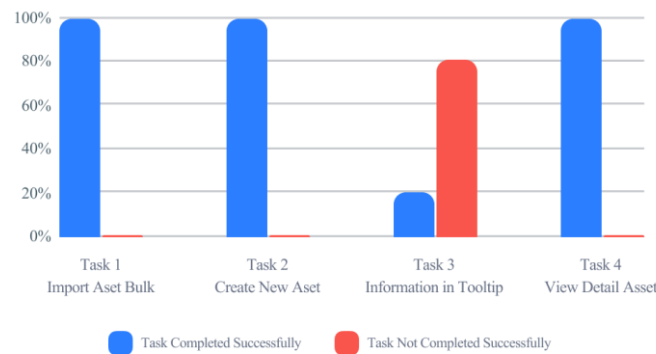


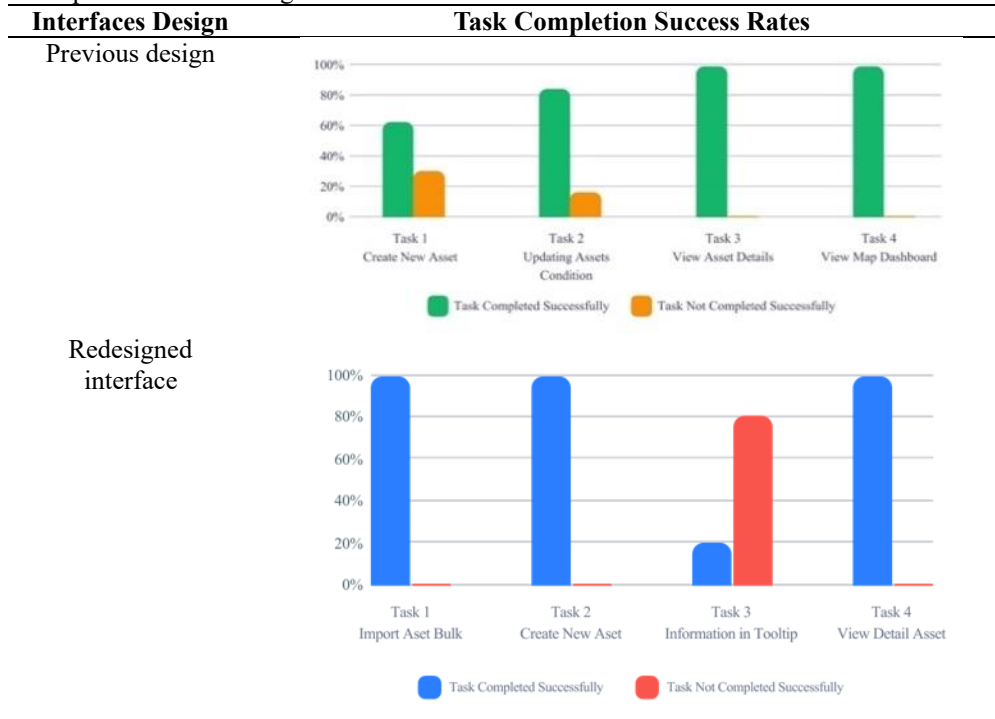
Figure 16 Bar diagram showing the success rate of each new design task.

Figure 16 presents task completion rates across four usability scenarios in the redesigned Toms Aset interface. Tasks 1 (Bulk Asset Import) and 2 (Create New Asset) were successfully completed by all five respondents, indicating a clear and intuitive interaction flow. Similarly, Task 4 (View Asset Details) achieved a 100% success rate, demonstrating an effective navigation structure. In contrast, Task 3 (Access Information via Tooltips) showed a low success rate (20%), as most participants failed to recognize the tooltips as an interactive element. This suggests insufficient visual affordance and limited interaction cues.

The findings indicate substantial improvement in core task performance, as presented in Table 7, while highlighting the need to refine the visibility and clarity of secondary interactive elements. Overall, the redesigned interface improved

task performance, though elements such as tooltips require further refinement to enhance visibility and interaction clarity.

Table 7 Comparative analysis of task completion success rates between the previous and redesigned interfaces.



Following usability testing, all five participants completed the second-stage SUS questionnaire to assess perceived usability. The SUS score served as a structured indicator of overall interface effectiveness and provided evaluative insight into how well the redesign addressed prior navigation and consistency issues. The results are presented in Table 8.

Table 8 SUS score calculation results for the redesign.

No	Questionnaire	Respondent				
		R1	R2	R3	R4	R5
1	Q1	3	3	4	3	3
2	Q2	4	3	4	3	2
3	Q3	4	3	4	4	3
4	Q4	1	3	4	4	0
5	Q5	4	3	4	4	2
6	Q6	3	3	4	4	1
7	Q7	4	3	4	3	2
8	Q8	4	3	4	3	3

No	Questionnaire	Respondent				
		R1	R2	R3	R4	R5
9	Q9	4	3	4	3	3
10	Q10	3	3	1	4	1
Total		34	30	37	35	20
Total * 2.5		85	75	92.5	87.5	50
Total * 2.5/5		78				

The redesigned interface achieved an average SUS score of 78, a notable improvement from the previous score of 58.75. This increase indicates a substantial enhancement in overall usability and perceived ease of use [25].

4 Conclusion

This study aimed to redesign the user interface of the Toms Aset website using a user centered design (UCD) approach. Throughout the process, the research focused on understanding users' actual needs and translating these insights into practical design solutions. Based on the problem formulation and research findings, usability testing of the earlier version revealed significant issues, particularly with the map dashboard and new asset creation form. The absence of scroll indicators, unclear asset categorization, and unstructured visual layout contributed to low task completion rates. The average SUS score of 58.75 placed the interface in the 'poor' range, indicating moderate usability but below global standards. Applying usability principles and the UCD framework, the redesigned interface addressed prior visual and structural inconsistencies. The development of a coherent design system including typography, color palette, grid layout, and standardized buttons and icons resulted in a more unified and professional interface. This improvement was reflected in the increase of the SUS score from 58.75 to 78. The introduction of more interactive navigation and inline solutions, such as pop-up forms for asset addition, improved task efficiency and overall usability. The SUS score increased from 58.75 (poor) to 78 (good), exceeding the commonly cited global average benchmark of 68.

References

- [1] Nissen, A., Riedl, R. & Schütte, R., *Users' Reactions to Website Designs: A Neuroimaging Study based on Evolutionary Psychology with a Focus on Color and Button Shape*, Computers in Human Behavior, **155**, pp. 1-15, 2024.
- [2] Grand View Research, *Asset Management Market Size*, <https://www.grandviewresearch.com/industry-analysis/asset-management-market>, (8 March 2026).
- [3] KBUMN, Ministry of State-Owned Enterprises Asset Portal, 2022, dev-asset-kbumn.toms.id, dev-asset-kbumn.toms.id, (14 November 2024).

- [4] Norman, D., *The Design of Everyday Things*, Basic Books, 2002.
- [5] Srisathan, W.A., Ketkaew, C., Jantuma, N. & Naruetharadhol, P., *Trust and Website Conversion in Consumer Responses to Green Product Purchasing: A New Perspective through the Lens of Innovative Website Design's Technology Integration*, *Heliyon*, **10**(1), pp. 1-14, 2024.
- [6] Nielsen, J., *Usability Engineering*, Elsevier, 1993.
- [7] Steve, K., *Don't Make Me Think!: A Common Sense Approach to Web Usability*, Recording for the Blind & Dyslexic, 2008.
- [8] Geisen, E. & Bergstrom, J., *Usability Testing for Survey Research*, Morgan Kaufmann Publishers Inc., 2017.
- [9] Lewis, J.R. & Sauro, J., *Usability and User Experience: Design and Evaluation*, *Handbook of Human Factors and Ergonomics*, Wiley, 2021.
- [10] Equey, C., Priftis, A., Trabichet, J.P., & Hutzli, V., *Designing a Digital Citizen-centered Service*, *Technological Forecasting & Social Change*, **202**, pp. 1-8, 2024.
- [11] Moran, K., *Usability Testing 101*, <https://www.nngroup.com/articles/usability-testing-101/>, (8 March 2026).
- [12] Rosson, M. & Carroll, J., *Usability Engineering. Scenario-Based Development of Human-Computer Interaction*, Morgan Kaufmann Publishers Inc., 2001.
- [13] Underwood, J. & Holzinger, A., *HCI and Usability for Education and Work*, Springer-Verlag Berlin Heidelberg, 2008.
- [14] Anderson, S.P., *Seductive Interaction Design: Creating Playful, Fun, and Effective User Experiences*, New Riders, 2011.
- [15] Loeffler, D., Hess, A., Maier, A., Hurtienne, J. & Schmitt, H., *Developing Intuitive User Interfaces by Integrating Users' Mental Models into Requirements Engineering*, BCS-HCI '13: Proceedings of the 27th International BCS Human Computer Interaction Conference, 2013.
- [16] Gandhi, M., Gaur, A., Kar, A.K. & Dwivedi, Y.K., *Crafting User Experiences in the Metaverse: A Design Science Study*, *Technological Forecasting & Social Change*, **209**, pp. 1-14, 2024.
- [17] Brooke, J., *SUS: A Quick and Dirty Usability Scale*, Redhatch Consulting Ltd., 1995.
- [18] Tullis, T. & Stetson, J.N., *A Comparison of Questionnaires for Assessing Website Usability*, Proceedings of the Usability Professionals Association Conference, 2004.
- [19] Sridevi, S., *User Interface Design*, *International Journal of Computer Science and Information Technology Research*, **2**(2), pp. 415-426, 2014.
- [20] Shneiderman, B. & Plaisant, C., *Designing the User Interface: Strategies for Effective Human-computer Interaction*, ed. 4, Pearson Addison Wesley, 2005.

- [21] Hasimi, L. & Poniszewska-Maranda, A., *User Experience and Multimodal Usability for Navigation Systems*, Proceedings of the 17th Conference on Computer Science and Intelligence Systems, pp. 213–216, 2022.
- [22] Rustian, A., Kusumawidagdo, A. & Murwonugroho, W., *Digital Teaching Material User Interface Development to Increase User Experience in Open University*, Jurnal Seni & Reka Rancang, **5**(2), pp. 255-270, 2023. (Text in Indonesian and Abstract in English)
- [23] Nielsen, J., *10 Usability Heuristics for User Interface Design*, <https://www.nngroup.com/articles/ten-usability-heuristics/>, (8 March 2026).
- [24] Kurniawan, E., Nofriadi, N. & Nata, A., *Application of the System Usability Scale (SUS) to Measure the Usability of a Study Program Website at STMIK Royal*, Jurnal Goretan Pena, **5**(1), pp. 43-49, 2022. (Text in Indonesian)
- [25] Tullis, T. & Albert, W., *Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics (Interactive Technologies)*, Morgan Kaufmann Publishers Inc., 2008.
- [26] Heijsters, F.A.C.J., van Loon, G.A.P., Santema, J.M.M., Mullender, M.G., Bouman, M., de Bruijne, M.C. & van Nassau, F., *A Usability Evaluation of the Perceived User Friendliness, Accessibility, and Inclusiveness of a Personalized Digital Care Pathway Tool*, International Journal of Medical Informatics, **175**, pp. 1-9, 2023.
- [27] Itten, J., *The Art of Color: The Subjective Experience and Objective Rationale of Color*, Van Nostrand Reinhold Company, 1974.
- [28] Schmid, P., Thompson, W. & Sargent, D., *Back to the Future: On the Typography of Electronic Flight Deck Documentation*, Safety Science, **171**, pp. 1-16, 2024.
- [29] Faudzi, M.A., Cob, Z.C., Ghazali, M., Omar, R. & Sharudin, S.A., *User Interface Design in Mobile Learning Applications: Developing and Evaluating a Questionnaire for Measuring Learners' Extraneous Cognitive Load*, Heliyon, **10**(18), pp. 1-20, 2024.
- [30] Shi, A. Huo, F. & Han, D., *Role of Interface Design: A Comparison of Different Online Learning System Designs*, Frontiers in Psychology, **12**, pp. 1-9, 2021.
- [31] Hulme, A., *Language and Communication: Essential Concepts for User Interface and Documentation Design*, Oxford University Press, 1999.
- [32] Fabio, G., Giuditta, C., Margherita, P. & Raffaeli, R., *A Human-Centric Methodology for the Co-evolution of Operators' Skills, Digital Tools and User Interfaces to Support the Operator 4.0*, Robotics and Computer-Integrated Manufacturing, **91**, pp. 1-17, 2025.

- [33] Hatguina, Ariani, Rosadi, H. & Werdina, W., *Design of A Walking Activity Support for Patients with Falling Risk*, Jurnal Dimensi Seni Rupa dan Desain, **20**(1), pp. 13-24, 2023.
- [34] Nielsen Norman Group, *How to Improve User Experience with Navigation*, <https://www.nngroup.com/topic/navigation/>, (8 March 2026).