

UI/UX Design of Mobile-Based Environmental Reporting Application Using User-Centered Design Method

Faozan Sudrajat¹, Indra Lukmana Sardi², Shinta Yulia Puspitasari³

School of Computing, Telkom University, Indonesia^{1,2,3}

faozansudrajat@student.telkomuniversity.ac.id¹, indraluk@telkomuniversity.ac.id²,
shintayulia@telkomuniversity.ac.id³

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ABSTRACT

The industrial revolution has significantly increased greenhouse gas emissions, leading to global warming and climate change, which imposes challenges on producers worldwide. In Indonesia, PT United Tractors Tbk, a major player in the heavy equipment industry, faces difficulties in the environmental reporting process due to the use of separate data collection methods. This lack of integration among various aspects prevents environmental reporting from being done on the spot and complicates the tracking of reporting data. This research aims to design an intuitive user interface (UI) and a seamless, satisfying user experience (UX) for a mobile-based environmental reporting application using the User-Centered Design (UCD) method. The focus is on integrating all aspects of environmental reporting — including water, hazardous waste, non-hazardous waste, and air — into a practical mobile platform for the company's environmental staff. The System Usability Scale (SUS) method was used to evaluate the efficiency, user satisfaction, and acceptance of the UI/UX design. Results from SUS, involving 12 prospective users among the company's environmental staff, yielded an average score of 89.4, indicating an excellent rating and demonstrating that the UI/UX design is highly efficient, satisfactory, and well-received by users.

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Corresponding Author:

Indra Lukmana Sardi
School of Computing
Telkom University
Jl. Telekomunikasi. 1, Bandung, Indonesia
Email: indraluk@telkomuniversity.ac.id

1. INTRODUCTION

The industrial revolution has significantly contributed to the rise in greenhouse gas emissions, which has led to global warming and climate change, placing a considerable burden on several global manufacturers [1]. In Indonesia, the adverse effects of industrial growth have long been a concern for society. This has prompted efforts to develop policies aimed at reducing environmental harm [2]. To address industrial issues, the Indonesian government has introduced several policies to promote sustainable practices in all national economic development activities. This includes the establishment of Green Industry Standards (SIH) under Minister of Industry

Regulation Number 50 of 2020 and the PROPER program, aimed at enhancing companies' environmental management performance, under Minister of Environment and Forestry Regulation Number 1 of 2021 [3]. In line with these policies, PT United Tractors Tbk, a key player in Indonesia's heavy equipment industry, actively implements government directives in its environmental management practices.

Based on interviews conducted with 6 representatives of the environmental staff of PT United Tractors Tbk, especially in the PPI Cakung area, it is known that the environmental reporting process at the company's operational scale still uses several separate media. This lack of efficiency, due to the use of various media for each environmental data aspect, often results in data loss and makes it difficult to track. Additionally, the different geolocations for each environmental data aspect require the data to be collected first and cannot be reported on the spot. To address this issue, the digitalization of all the environmental reporting process is needed by utilizing practical and easily accessible media from anywhere to facilitate environmental reporting activities into a single integrated digital product. The implementation of digitalization in various sectors in Indonesia and globally has provided significant benefits to companies' efficiency in managing and taking responsibility for the environmental impacts [4], [5].

To meet these needs, a mobile application is the only solution to fulfill the company's need for environmental reporting processes. Mobile-based applications have become an essential domain in supporting human work [6]. The development of mobile technology and digital innovation currently enhances individual and community participation in environmental protection efforts and climate change mitigation through practical applications [7]. A mobile application can enhance connectivity and utility by providing quick access to information, while also being accessible anytime and anywhere [8]. The built-in camera offered by every mobile device can assist in daily activities [9], allowing access to the camera at any time for data collection in the form of photo documentation.

In designing mobile-based applications, it is important to focus on user interface interactions to ensure the application is easy to use and satisfying for users. User satisfaction is a measure of an application's success, influenced by the quality of the interface, system, information, and user experience. Factors such as responsiveness and clarity of information also contribute to user comfort and satisfaction [8], [10]. Therefore, it is necessary to design the user interface and user experience to streamline the reporting process for each environmental aspect of the company into a single, integrated mobile digital platform with a user-friendly and satisfying interface.

One of the UI/UX methods used in this study is User-Centered Design (UCD). The UCD method was chosen because it offers several benefits, such as developing a more effective system focused on user needs and profiles [11]. Various studies on mobile application development using the UCD method have shown success in meeting user needs. For instance, Defriani et al. demonstrated this with evaluation results that mostly revealed positive feedback [12]. Additionally, research related to environmental issues, such as the study by Kamarulredzuan et al. on the user interface design of a food waste management application using the UCD approach, resulted in positive responses with a score of 87.5, indicating effectiveness and user needs fulfillment [13]. Other related articles, such as the one by Golumbic et al., showed that applying UCD in the "Sensing the Air" project contributed to the design and development of a platform that supports public needs and creates a practical and useful user interface [14].

From the user interface design results, a user experience evaluation is conducted to assess user satisfaction and evaluate the fulfillment of several feature requirements identified from the interviews. In this study, the evaluation is performed using the System Usability Scale (SUS) method [15]. SUS offers several benefits and ease of implementation, including the need for a relatively small number of respondents [16]. Various studies have shown that the SUS method is effective in measuring the usability of the application, such as efficiency and user satisfaction, as well as demonstrating significant improvements with higher acceptance scores and the quality of the UI created [17], [18], [19].

2. RESEARCH METHOD

This study employs a user-centered design (UCD) approach to develop a UI/UX for an environmental reporting application that effectively meets the needs of PT United Tractors Tbk's environmental staff in the PPI Cakung area, resulting in an efficient and satisfying user experience.

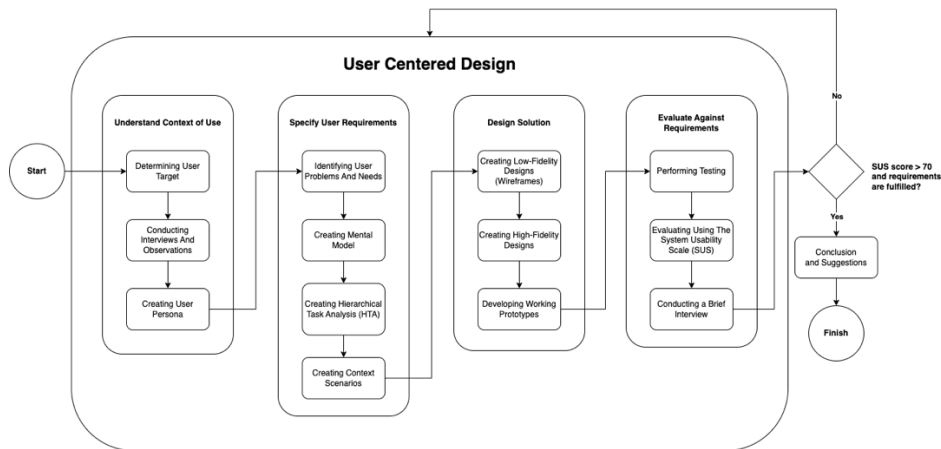


Figure 1. User Centered Design

2.1. Understand Context Of Use

This stage begins with determining the context of application use. This includes identifying the target audience, objectives, and the environment in which the application will be used. Once the target users are defined, the process continues with interviews and observations to identify user pain points, which will be represented in the form of user personas.

2.2. Specify User Requirements

This stage involves detailing the user requirements identified earlier by collaborating with stakeholders to define the necessary features of the application. It starts with listing requirements to ensure that all user needs are addressed and then progresses to creating mental models to align the design with users' expectations. Hierarchical Task Analysis (HTA) is employed to break down complex tasks into smaller, manageable components, mapping out the hierarchy of tasks, subtasks, and actions. HTA helps designers understand the sequence of user interactions and identify potential inefficiencies by visualizing how tasks are structured and how they interrelate. This detailed analysis influences application design by ensuring that user interfaces are streamlined and intuitive, addressing critical tasks effectively and reducing cognitive load. Defining contextual scenarios provides additional insights into real-world use cases, guiding the design to accommodate various user environments and conditions. Together, these steps ensure that the application meets functional needs, aligns with user understanding, and performs effectively in practical contexts, resulting in a cohesive and user-centered solution.

2.3. Design Solution

This stage involves developing design solutions that address user needs and context based on the specifications established in earlier phases. It begins with creating low-fidelity designs, such as wireframes, which provide a basic structure and layout of the application. These wireframes help in visualizing the fundamental elements and user flow without detailed visual design. The process then progresses to high-fidelity designs, where more detailed and polished visual elements, including colors, typography, and interactive features, are incorporated to better represent the final look and feel of the application. Following the high-fidelity designs, prototypes are created to simulate the user experience and functionality of the application. Prototypes allow for interactive testing and refinement, enabling researchers and designers to gather feedback, validate design choices, and make necessary adjustments before final implementation. This iterative process

ensures that the design solutions are not only aesthetically pleasing but also functional, user-friendly, and aligned with the identified requirements and contextual scenarios.

2.4. Evaluate Against Requirements

This stage involves evaluating the created prototype with actual end-users. The goal is to ensure that the application's UI design meets the requirements, usability, and user needs. The researcher conducts tests with several representative participants who will be the future users of the application. During this stage, participants are given various task scenarios to test, allowing the researcher to observe how users interact with the application. Subsequently, participants are given a System Usability Scale (SUS) questionnaire to assess their user experience with the application.

The SUS questionnaire uses a 5-point scale, where responses range from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). Missing responses are scored as 3. Positive item scores (1, 3, 5, 7, and 9) are computed as the scale position minus 1, while negative item scores (2, 4, 6, 8, and 10) are calculated as 5 minus the scale position.

To determine the overall SUS score, the sum of these item scores is multiplied by 2.5, resulting in a SUS score that ranges from 0 to 100 with a 2.5-point interval [20], [21]. The formula for calculating the SUS score is detailed in Equation 1.

$$Skor\ SUS = ((Q1 - 1) + (5 - Q2) + (Q3 - 1) + (5 - Q4) + (Q5 - 1) + (5 - Q6) + (Q7 - 1) + (5 - Q8) + (Q9 - 1) + (5 - Q10)) \times 2.5 \quad (1)$$

After obtaining the SUS scores from each respondent, the overall average score of all respondents is calculated using the formula shown in Equation 2 [21], [22].

$$\sum_{i=0}^n xi/N \quad (2)$$

xi = Respondent Score Value

N = Number of Respondents

Based on the average SUS scores obtained, the user interface of the application can then be categorized as accepted by users or not. According to Bangor et al., an application is considered adequate if the score reaches 70, and categorized as good if it falls within the range of 70-80. Meanwhile, a SUS score above 90 is categorized as excellent, and scores below 70 require further analysis [23].

3. RESULTS AND ANALYSIS

3.1. Understand Context of Use

This stage begins with the identification of the application's user target, which includes staff from the environmental section of the Environment, Health & Safety (EHS) department at PT United Tractors Tbk, particularly in the PPI Cakung area. Based on the established target, interviews were conducted with six participants or the company's representatives to gather detailed information on user characteristics for user persona creation, as well as to identify user problems and needs for further detailed identification. The interview questions used as a reference can be seen in Table 1.

Table 1. List of Interview Questions

No	Questions
1.	What kind of system does your company currently use for environmental reporting processes?
2.	What are the obstacles and issues faced with the current system?
3.	What do you need when reporting the environment of your company?
4.	Have there been any previous systems or digital applications that facilitate the

- environmental reporting activities of the company, or have you tried several applications that support these activities?
5. What is your experience when using these applications?
 6. What specific information or features do you expect when using environmental reporting applications?
 7. What information or features do you feel are unnecessary in environmental reporting applications?
 8. What type of application interface design is suitable and easy for you to understand?
 9. Which parties will use the environmental reporting application in your company?
 10. Do you have any suggestions, inputs, or expectations to convey for the company's environmental reporting application?

The conclusions drawn from the conducted interviews provide a general overview of the users' characteristics and pain points [24]. This overview is illustrated through a user persona, which can be seen in Figure 2.

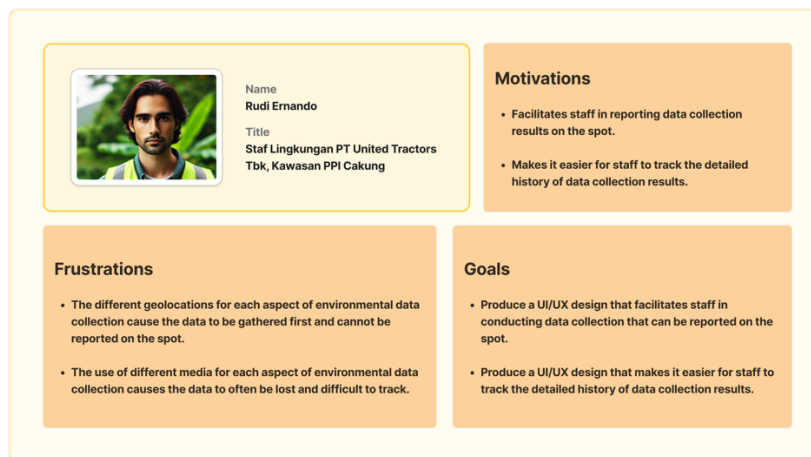


Figure 2. User Persona

3.2. Specify User Requirements

After obtaining the comprehensive results of the user characteristics and pain points review derived from the detailed analysis of user personas, the next step involves meticulously detailing the specific requirements and tasks. This process ensures that every aspect of the user experience is thoroughly understood and addressed. By delving deeply into the nuances of user needs and challenges, we can create a more tailored and effective solution that aligns closely with the users' expectations and enhances their overall interaction with the application. This detailed approach not only helps in identifying the core functionalities that are essential for the users but also aids in prioritizing features that will significantly improve user satisfaction and engagement. By thoroughly understanding and documenting these requirements, we can ensure that the final product is both user-friendly and highly functional, meeting the diverse needs of its intended audience.

Table 2. Requirements and Task

No	Requirements	Tasks
1.	Availability of data collection facilities for water reporting activities	<ul style="list-style-type: none"> Wastewater and clean water data collection activities. Wastewater data collection is conducted daily by internal parties and monthly by external parties, recording several predetermined water quality parameters.

	<ul style="list-style-type: none"> • Clean water data is collected twice a week to record the company's water consumption at each installed meter location.
2. Availability of data collection facilities for hazardous waste (B3) reporting activities	<ul style="list-style-type: none"> • This activity involves two stages of data collection: the first stage is recording the received hazardous waste (B3). • After receiving the waste, the second stage involves recording the removal of the hazardous waste when the B3 waste storage (TPS) is full or the waste has reached the maximum storage limit.
3. Availability of data collection facilities for non-hazardous waste reporting activities	<ul style="list-style-type: none"> • This activity consists of waste sorting and waste processing. • Each incoming waste is sorted and recorded based on its type. • Additionally, there is data collection for waste processing to record the products resulting from the processed waste.
4. Availability of data collection facilities for air quality reporting activities	<ul style="list-style-type: none"> • This activity consists of recording Stationary Emissions (Generator Chimney), Mobile Emissions (Forklift), and Outdoor Ambient. • The data collection for Stationary Emissions and Outdoor Ambient Air involves two stages. The first stage is documenting the sampling activity with photos, and the second stage is filling in the sample data results provided by the laboratory, following the predetermined parameters. • For Mobile Emissions, data is collected on the forklifts in the company, and the air quality of the forklifts is recorded following the predetermined parameters.
5. Availability of an activity log	<ul style="list-style-type: none"> • A log of reporting activities conducted today and in the past.
6. Availability of a reporting history	<ul style="list-style-type: none"> • A list and details of reporting results.

After that, a mental model is created to align the internal representation with the habits of users or environmental staff of the company in performing environmental reporting activities [25], [26], [27]. In general, the mental model is formed using an affinity diagram to group and organize related information or ideas [28]. The mental model design shown in Figure 3 reflects a general overview of the process typically carried out by the environmental staff of PT United Tractors Tbk, particularly in the PPI Cakung area, in conducting the company's environmental reporting activities.

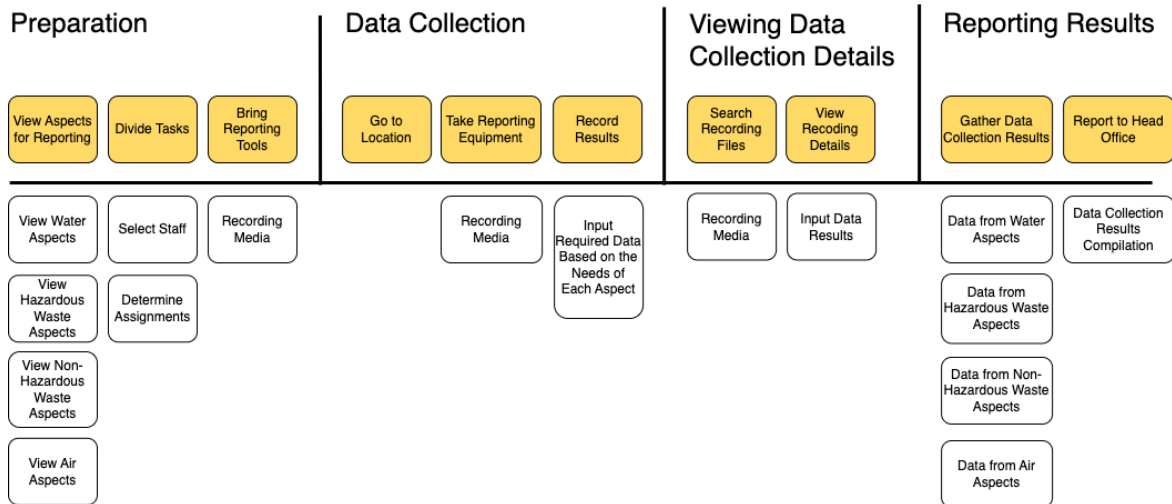


Figure 3. Mental Model

Based on the established mental model, the existing tasks can be comprehensively analyzed using Hierarchical Task Analysis (HTA) to provide a detailed depiction of the user's task flow in achieving the necessary goals when using the application [29]. HTA is a powerful method that can simplify complex activities into several smaller, more manageable sub-tasks, thereby making it easier to identify and understand the application's overall process flow [30]. By breaking down each task into its constituent parts, HTA allows us to pinpoint specific actions and decisions that users must take at each step. This detailed breakdown not only clarifies the sequence of operations but also highlights potential areas where users might encounter difficulties or inefficiencies. The results of HTA shown in Figure 4 detail the entire process of environmental reporting activities, which can assist in designing the task flow of the company's environmental reporting application, from selecting the environmental aspect to be reported—whether it is water reporting, hazardous waste (B3), non-hazardous waste (non-B3), or air—down to the sub-tasks under each aspect, which can guide the design of the subsequent task flow that users must follow to achieve the goals in each aspect of the company's environmental reporting.

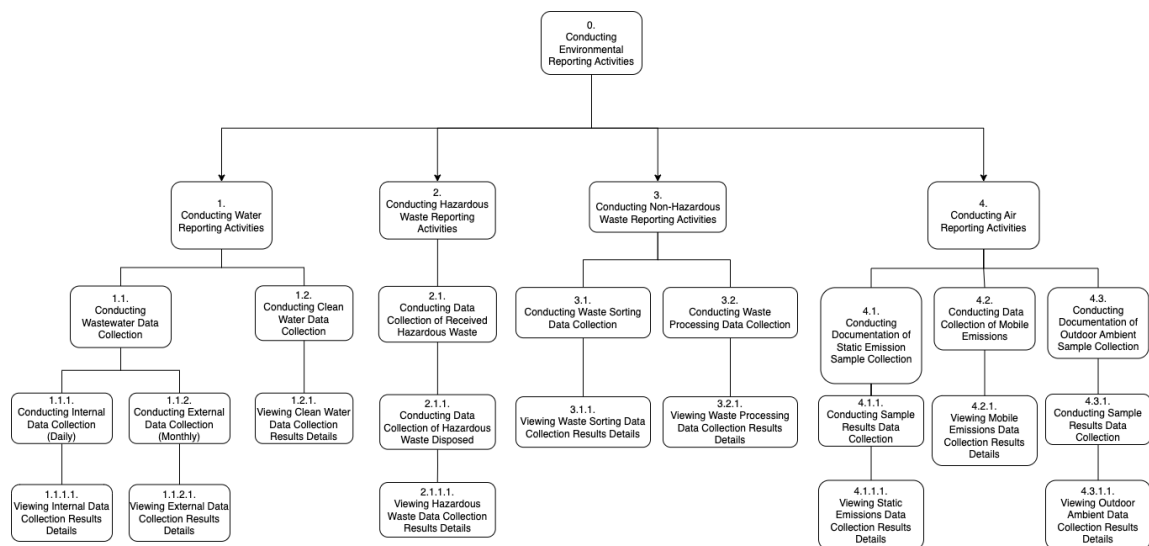


Figure 4. Hierarchical Task Analysis (HTA)

The next step is to create context scenarios. Context scenarios are designed to map user

goals through their interactions and activities with the system or application. The outcome of this process is information that can guide the development of the design as well as the testing workflow.

Table 3. Context Scenarios

Context Scenario	Tasks	Goals
The user wants to log in to the application	1. Open the application. 2. Log in using the username and password based on the predefined role	The user successfully log in to the application
The user wants to conduct water reporting activities	1. Conduct data collection for waste water and clean water 3. View data collection results	User successfully conducted water reporting
The user wants to conduct hazardous waste reporting activities	1. Conduct data collection for incoming and outgoing waste 2. View data collection results	User successfully conducted hazardous waste reporting
The user wants to conduct non hazardous waste reporting activities	1. Conduct data collection for waste sorting and processing 2. View data collection results	User successfully conducted non hazardous waste reporting
The user wants to conduct Air reporting activities	1. Conduct data collection for static emissions, mobile emissions, and outdoor ambient 2. View data collection results	User successfully conducted water reporting
The user wants to view the environmental reporting activity log	1. See the log activity	The user can view the environmental reporting activity log
The user wants to log out the application	1. Log out application	The user successfully log out the application

3.3. Design Solution

The user requirements obtained from the previous stages are then carried forward to the design solution creation step. In the application design process, there are several user interface design principles that are commonly considered [31]. These principles can be seen in Table 3.

Table 4. UI Design Principles

No	UI Design Principles
1.	Informative feedback for every user action
2.	Strive for consistency
3.	Use simple and everyday language in dialogs
4.	Make everything visible
5.	Help users recognize and recover from errors
6.	Minimize the user's memory load
7.	Allow users to customize the interface (preferences)
8.	Use repetitive design to eliminate usability issues
9.	Actions should be reversible
10.	Provide shortcuts

Next, the application design is created in the form of low-fidelity (wireframes). Wireframes are an essential tool in the design process for organizing the layout of information related to environmental reporting. They help in structuring content across various aspects such as water, hazardous waste (B3), non-hazardous waste, and air quality. This initial visualization facilitates the organization and navigation of content based on UI design principles, ensuring that the layout

aligns with user needs and expectations. Wireframes can also optimize time in adjusting information elements if changes occur later on [32]. Wireframes do not have specific images, colors, or typography in their application [33].

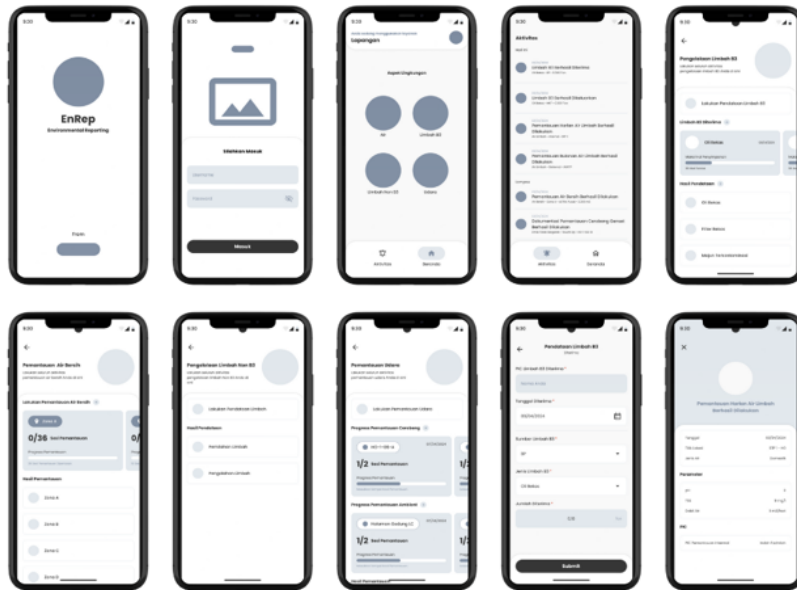


Figure 5. Wireframes

After creating the Low-Fidelity design, the next step is to create the High-Fidelity design. The High-Fidelity design aims to provide a more detailed depiction of the application by incorporating visual elements such as color, typography, and illustrations, making it closely resemble the final appearance of the application according to the needs and preferences of the users. However, before creating the high-fidelity designs, the application style is first determined to serve as the design guide.

a) Logo

The Environmental Reporting application logo is created using a symbolic logo base to represent suggestive symbols of the activity being carried out, namely environmental reporting itself [34].

b) Color

The primary colors used in the Environmental Reporting application include yellow as the identity of PT United Tractors Tbk. Yellow is often used to signify warnings or attention. In the environmental reporting application, this color is used to draw users' attention to important information or environmental conditions that need to be noted. Additionally, green is selected to represent nature [35]. Basic black is also employed for text, ensuring readability and visual contrast.

c) Font

The font used in this application is one of the sans-serif fonts, namely Poppins. Poppins was chosen because it has a simple and easy-to-read appearance [36]. Sans-serif fonts like Poppins are commonly used in digital text formats for their readability on screen displays. Studies also indicate that certain sans-serif fonts can offer better readability compared to certain serif fonts [37].

Next, the development of a working prototype is carried out following the high-fidelity design to facilitate application testing with real users. This stage involves creating a functional prototype using Kotlin as the programming language for the frontend and Node.js for the backend. The purpose is to ensure that the prototype closely mimics the final product, allowing for

comprehensive testing and feedback from users.

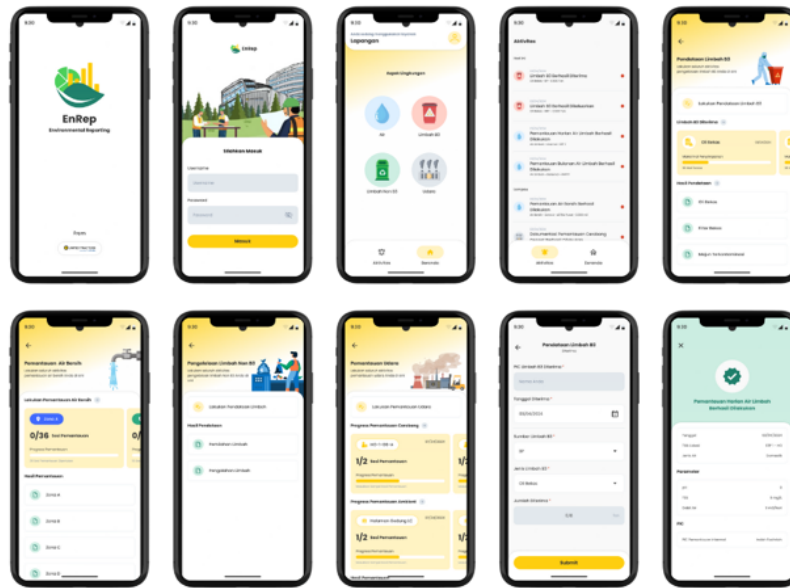


Figure 6. High Fidelity and Prototype

3.4. Evaluate Against Requirements

At the final stage of User-Centered Design (UCD), usability testing is conducted on the created prototype with several participants to evaluate the user experience when using the application. First, the participants are required to complete several tasks provided. After all tasks are completed, the participants fill out the System Usability Scale (SUS) questionnaire to assess the application's usability, followed by a brief interview to determine whether the application meets the required criteria or not.

User testing was conducted with 12 participants. They were given several testing scenarios based on the prepared Context Scenarios. The number of testing participants was chosen to align with the capacity of staff representatives who would become potential application users and to conform with the majority of usability testing commonly performed in the industry, which typically involves around 8-12 participants [38].

Overall, the scenario testing conducted includes 7 tasks, namely logging in to the application, conducting environmental reporting and data entry, accessing the environmental reporting dashboard, viewing the environmental reporting activity log, and viewing the results list of environmental reporting data.

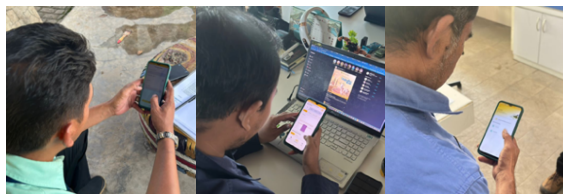


Figure 7. User Testing

After testing the working prototype, participants were asked to complete the SUS questionnaire to assess their satisfaction and experience while using the application.

SUS is one of the UX questionnaires used to measure the usability of an application in terms of user satisfaction [38]. The SUS measurement consists of 10 questions with a mix of positive and negative wording to assess usability [20].

The SUS questionnaire uses a 5-point scale, where responses range from 1 ("Strongly

Disagree") to 5 ("Strongly Agree"). Missing responses are scored as 3. Positive item scores (1, 3, 5, 7, and 9) are computed as the scale position minus 1, while negative item scores (2, 4, 6, 8, and 10) are calculated as 5 minus the scale position.

Table 5. SUS Result

Resp.	Questions										Score
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	
R1	5	1	5	1	4	1	4	2	5	4	85
R2	5	2	4	2	5	1	5	1	5	2	90
R3	5	2	4	1	5	1	4	2	4	1	87.5
R4	5	2	4	1	5	1	4	1	4	2	87.5
R5	5	2	4	2	5	2	3	1	5	2	82.5
R6	4	1	4	2	5	1	3	1	5	3	82.5
R7	5	1	5	1	4	1	3	2	5	1	90
R8	5	1	5	2	5	2	5	1	4	1	92.5
R9	5	1	5	2	5	1	5	1	4	1	95
R10	4	2	5	1	5	2	4	1	5	1	90
R11	5	1	4	1	5	1	3	1	5	2	90
R12	5	1	5	1	5	1	5	1	5	1	100
Average											89.4

Based on the results of the SUS questionnaire in Table 5, the average score was 89.4, which falls into the categorization of excellent. This indicates that the application is easy to use and well-received by potential users, specifically the environmental department staff of the company. The SUS results reflect that the application meets user expectations and is acceptable for its intended purpose.

The resulting SUS score can be analyzed based on the average score on each question component. The average value of each question can be seen in Table 6.

Table 6. Average Score of Each Component of SUS Questions

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

R11	4	4	3	4	4	4	2	4	4	3
R12	4	4	4	4	4	4	4	4	4	4
Avg. Score	3,83	3,6	3,5	3,6	3,83	3,75	3	3,75	3,7	3,25

Based on the table above, the results highlight that the environmental reporting application effectively addresses the inefficiencies of the previous reporting process, which involved using various media for each environmental data aspect. This approach resulted in data loss, difficulties in tracking, and delays due to the need for data collection before reporting. The application's design, evaluated through questions Q5, Q3, Q8, and Q9, shows significant improvements in efficiency [19]. It enables on-the-spot reporting and integrates data collection into a single, cohesive system, addressing the previous inefficiencies.

Additionally, the analysis reveals that the application has achieved high user satisfaction, with positive results from questions Q1 and Q9. This indicates that the UI/UX design successfully meets user needs and expectations, contributing to a high level of satisfaction. However, the lowest average SUS score was found in component Q7, which assesses learnability and memorability. This suggests that some users may need additional time to adapt to the new application. Future development should focus on enhancing features to improve user understanding and recall of the application's functions. Overall, the application has effectively overcome the challenges of the previous system, improving efficiency and user satisfaction.

3.5. Contextual Limitations and Methodology Adaptation

This study is highly specific to PT United Tractors Tbk, which may limit the generalization of the findings to other organizations or industries. While the results of this research provide valuable insights into UI/UX design for a mobile-based environmental reporting application in the heavy equipment industry, there are several limitations to consider. PT United Tractors Tbk operates in the heavy equipment industry, which has unique characteristics and needs. Therefore, the findings and methodologies used in this study may not fully apply to other industries with different dynamics and challenges. For instance, Kamarulredzuan et al. [13] demonstrated the effectiveness of the User-Centered Design (UCD) approach in the food waste management industry, which has different requirements and user needs.

Additionally, this study was conducted in Indonesia, which has environmental regulations and business practices that may differ from other countries. Adapting the methodologies and findings to other geographical contexts may require additional adjustments. Zhang and Zhao [4] highlighted the importance of considering local regulations and practices when implementing digital transformation and environmental disclosure in different regions. Furthermore, PT United Tractors Tbk is a large company with significant resources. Applying these methodologies and findings to smaller organizations or those with different structures may require a tailored approach. Defriani et al. [12] showed that the UCD method can be successfully adapted for smaller-scale applications, such as mobile-based product distribution.

To enhance the broader application of this article, the study's methodologies and findings can be adapted to various contexts. The User-Centered Design (UCD) methodology used in this study can be applied to other industries by adjusting the stages of user needs identification and solution design. For example, in the healthcare industry, the focus can be on aspects such as data security and compliance with health regulations. Studies like those by Hyzy et al. [15] on digital health apps demonstrate the adaptability of UCD in different sectors. To adapt these findings to other geographical contexts, it is important to consider local environmental regulations and business practices. Additional studies can be conducted to understand the specific needs of users in different geographical locations. For example, the work by Golumbic et al. [14] on citizen science air-quality monitoring projects shows how UCD can be tailored to meet local needs.

The methodology used in this study can also be adjusted for organizations of different sizes and structures. For example, for smaller organizations, a simpler and less resource-intensive approach can be applied while maintaining the core principles of UCD. Research by Defriani et al.

[12] on mobile-based product distribution applications provides insights into how UCD can be scaled down effectively. Including this discussion will provide a more comprehensive and applicable guide for various organizations and industries looking to adopt the methodologies and findings of this study.

4. CONCLUSION

This study has successfully produced a UI/UX design for a mobile-based environmental reporting application, using a User-Centered Design (UCD) approach tailored to the internal needs of PT United Tractors Tbk, particularly in the PPI Cakung area. The new application addresses several issues identified in the previous reporting process, which relied on various media for each environmental data aspect. This reliance led to inefficiencies, data loss, and difficulties in tracking. Moreover, the different geolocations for each data aspect meant that data had to be collected before it could be reported on the spot.

The analysis of the SUS evaluation results reveals that the application excels in efficiency, as indicated by high scores on questions Q5, Q3, Q8, and Q9. These results highlight that the application effectively enhances reporting efficiency and meets user needs. In addition to efficiency, the application has achieved notable success in user satisfaction. High scores on questions Q1 and Q9 show that the UI/UX design meets user expectations, further confirming that the application is well-received by the company's environmental staff.

Despite these positive outcomes, the analysis also points to areas needing improvement. Specifically, the lowest average SUS score was found in component Q7, which evaluates learnability and memorability. This suggests that some staff members may need additional time to adapt to the new application. To address this, future development should focus on enhancing features that aid user understanding and recall of application functions. Furthermore, adding a dashboard for head office users could offer a comprehensive view of all reporting data, thereby facilitating more informed decision-making.

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