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Application of Design Thinking in Designing User Interface Prototype of Worker Health Screening Application at PT Petrokimia Gresik

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Abstract

The application of digital technology in the worker health screening process is an important need in the industrial work environment, especially in supporting the effectiveness and efficiency of the OHS medical team's work. This research aims to design a user interface for the AppSheet-based worker health screening application using the Design Thinking approach. This method was chosen because it is centered on user needs and is able to produce innovative solutions through the stages of Empathize, Define, Ideate, Prototype, and Testing. Data collection was conducted through interviews and observations of five respondents from the OHS medical team and five department representatives. Assessment of the design was carried out using the usability testing method, with efficiency, effectiveness, and System Usability Scale (SUS) parameters. The results showed that the Design Thinking approach was able to produce an application interface that meets user needs, improves understanding of workflows, and minimizes recording errors. The developed application not only supports the digital health evaluation process, but also has the potential to reduce administrative burden and improve the quality of medical services at PT Petrokimia Gresik.

Introduction

Occupational health and safety (OHS) is an important aspect in the company, especially for companies that involve contractor labor in their operational processes (Djaelani & Darmawan, 2022; Yilmaz & Yildiz, 2021; Mavroulidis et al., 2022; Costa e al., 2021). In the process of work, contractor labor often works with high risks, such as working at heights, working in confined spaces, doing hot work, and others that require excellent physical and health conditions. The OHS field is one that has undergone major changes as a result of advances in information and communication technology. In the modern era, the use of technology improves the efficiency, accuracy, and speed of business processes (Waviandy, 2022; Zahar Djordjevic ET AL., 2022; Hussain, 2024; Blahušiaková, 2023).

Contractors are individuals or companies hired to carry out certain construction work or projects based on a contract agreed with the party requiring the services (Finnie et al., 2022; Vilkonis et al., 2023). They are responsible for planning, organizing, and supervising the implementation of the project from start to finish, in accordance with the specifications and conditions set out in the contract (Winoto et al., 2023; Schaufelberger & Holm, 2024; Piwowar-Sulej, 2024). PT Petrokimia Gresik in recruiting contractor workers involves an outsourcing company which is a subsidiary of Petrokimia Gresik. This outsourcing company is responsible for providing contractor labor in accordance with the needs and specifications determined by PT Petrokimia Gresik. The contractor workers are known as Non-Organic

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Workers (TKNO), which refers to workers who are not directly tied to the company's organizational structure, but are hired through outsourcing companies or third parties to carry out certain projects.

PT Petrokimia Gresik in the process of screening workers' health is currently still done manually using paper. This process requires officers to physically fill out forms, which then need to be scanned or re-recorded into the system. This causes various challenges that have an impact on operational efficiency and effectiveness (Obiki-Osafiele et al., 2024; Hanaysha & Alzoubi, 2022). The manual worker health screening process at PT Petrokimia Gresik has various limitations that affect the efficiency and accuracy of the data. The stages of application submission, document verification, health form filling, and data processing into Excel take a long time, with a high potential for recording errors (Sharma et al., 2021; World Health Organization, 2023). In addition, manual processes that rely on physical documents are vulnerable to data corruption or loss, which can disrupt the smooth running of the process and cause delays in decision-making. Reliance on non-integrated systems and sending results individually to partners also adds to the administrative burden and slows down necessary follow-up, such as medical action (Curry & Ham, 2010).

Along with the various obstacles experienced by the OHS medical team in the process of implementing worker health screening, an innovative solution oriented to user needs is needed (Ashari, 2022; da Silva & Amaral, 2019; Masi & Cagno, 2015). Therefore, the application of design thinking to the design of the User Interface (UI) of the worker health screening application is a much needed solution. Judging from previous research, Design Thinking focuses on understanding user needs and creating innovative solutions with a user-centered approach. This method was chosen because it can create a design that not only speeds up the workflow in the health screening process, but also minimizes recording errors, improves data accessibility, and reduces administrative burden. By following the stages of Design Thinking such as Empathize, Define, Ideate, Prototype, and Testing, the developed application will be more in line with the needs of users, namely the medical team and the departments involved, and can improve efficiency and accuracy in managing worker health data at PT Petrokimia Gresik.

Design Thinking

Design Thinking is a method that focuses on a comprehensive thinking process to create solutions, starting with building empathy for specific human-centered needs. This method aims to produce sustainable innovation based on user needs. As the method evolved, the initial three stages evolved into five stages that are basically similar, but with emphasis on certain parts that make the procedure more detailed and structured (Fahrudin & Ilyasa, 2021; Peñalvo & Ingelmo, 2023).

Usability Testing

Usability testing is an evaluation method used to measure the extent to which a system or application can be used easily, efficiently, and satisfactorily by users in achieving certain goals. Usability testing aims to identify user interface problems, understand user behavior, and improve user experience with the system (Dhakal & Mahmood, 2025; Hertzum, 2022). The main goal of usability testing is to ensure that the application or system can be used easily and effectively by end users. In the context of the AppSheet application used for worker health screening at PT Petrokimia Gresik, usability testing is important to ensure that the application can be accessed and used easily by workers who have diverse technological backgrounds. According to Gonzalez et al. (2025), usability testing on worker health applications can increase the efficiency of the screening process and reduce human error in filling out health data.

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Performance Measurement

Performance measurement is used to assess aspects of effectiveness and efficiency in order to obtain quantitative data on the performance of participants when completing tasks in usability testing. In this method, the data generated is utilized for comparative analysis, especially in measuring efficiency through task completion time and assessing effectiveness by comparing the number of errors that occur during testing. The average percentage success score of respondents' effectiveness in completing task scenarios will be broken down based on the Effectiveness Measurement Reference Standards issued by the Ministry of Home Affairs Research and Development in 1991 (Nadila et al., 2025).

Table 1. Effectiveness Measure Standard

No.	Effectiveness Ratio	Achievement Level
1	< 40%	Highly Ineffective
2	40% - 59,99%	Ineffective
3	60% - 79,99%	Quite Effective
4	≥ 80%	Highly Effective

Source : Nadila et al (2025)

System Usability Scale

System Usability Scale (SUS) is a method used to test the usability of an application by providing ten scales that represent general user views regarding the usability of the application. SUS is used as a tool to measure the effectiveness and ease of use of an application or system in a simple way but can still provide fairly accurate information about the user experience. This test focuses on aspects of application usability that are assessed directly by end users, thus providing a picture that is more relevant and in accordance with the real conditions faced by users in daily use. The main purpose of usability testing using the SUS approach is to assess the usability of an application using techniques that are easy to implement and quick to carry out, but still reliable in providing adequate evaluation results. With SUS, usability evaluations can be conducted in a short period of time without compromising the accuracy of the results. This method is especially useful in the initial testing of an application or system, so that it can provide valuable insights into further improvements or developments needed (Nugroho et al., 2022).

Worker Health Screenings

According to Maheu et al. (2025), the implementation of comprehensive health screening in the workplace can improve employee well-being and reduce the risk of accidents and absenteeism due to illness. In addition, companies can adjust their occupational health policies based on the screening results to ensure a safer and healthier working environment.

Methods

This research focuses on the medical team of PT Petrokimia Gresik and representatives of departments involved in screening workers' health. Data collection was carried out by conducting direct interviews and distributing questionnaires via google form online.

Emphatize

The emphatize stage is the initial stage of this research with the aim of collecting information from users and getting an overview of the problem. The data collection technique used in this research is to conduct direct interviews. The Emphatize stage was carried out with 5 respondents from the OHS medical team of PT Petrokimia Gresik. The results of observations and interviews that have been conducted, researchers continue the analysis process by compiling an empathy map that includes four main aspects, namely: say, do, think, and feel.

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Through the empathy map, researchers gained a deeper understanding of the emotions, needs, goals, and pain points experienced by the OHS medical team at PT Petrokimia Gresik. This empathy map serves as a tool to describe the user's perspective holistically, so that it can assist in formulating solutions that are more targeted, based on the real experiences and perceptions of those directly involved in worker health screening.

Table 2. OHS Medical Team Interview Questionnaire

No	Question
Says	
1	What manual recording and reporting processes do you often do?
2	What are the obstacles you often experience in using the manual system?
3	Do you often find it difficult when you have to search for certain data or documents?
4	Does the digital system meet your expectations for supporting worker health evaluation?
Feels	
5	How do you feel when you have to work with a lot of manual data?
6	What do you feel when there is a problem in recording or loss of data?
7	Do you feel frustrated or tired when working with manual systems?
8	Do you feel anxious if your worker status is not properly recorded in the system?
Thinks	
9	Do you think the current system is efficient or does it need to change?
10	How do you think work processes should be conducted to improve efficiency?
11	Do you think that the filing system should be improved and made more efficient?
12	What do you think about using a system that can be accessed by all parts of the company?
Does	
13	How do you access and check current worker data?
14	What do you do when you have to input data or search for specific data?
15	How do you handle physical documents in the health evaluation process?
16	Do you do manual confirmation to check worker status?

Testing

The test method used in this research uses the System Usability Scale questionnaire. The selection of 10 respondents consisting of 5 members of the K3 medical team and 5 representatives from the production and warehouse departments was carried out purposively, taking into account their direct involvement in the worker health screening process. The OHS medical team was selected because they are the main users who operate the application on a daily basis, while representatives from production and warehousing were selected because they represent workers who are the object of health evaluation and are often involved in the screening submission process. As such, both groups are considered to have relevant understanding and experience of the context in which the application is used.

This questionnaire is a statement consisting of 10 questions that have been translated into Indonesian. The questionnaire was given to respondents online via google form after the respondents used the prototype application. Then the average score obtained will be categorized based on the SUS rating scale. The questionnaire consists of 10 questions based on using a five-point response weighted Likert scale model to measure each statement. Points on the Likert scale include: “Strongly Disagree (STS)”, ‘Disagree (TS)’, ‘Neutral (N)’, ‘Agree (S)’ and ‘Strongly Agree (SS)’.

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Table 3. System Usability Scale Questionnaire

No	Question	1	2	3	4	5
1	I feel confident that I can use this app without the help of others.	STS	TS	N	S	SS
2	I feel that this app is very complicated to use.	STS	TS	N	S	SS
3	I feel that this app helps speed up the process of evaluating workers' health.	STS	TS	N	S	SS
4	I feel that using this app makes my work process slower.	STS	TS	N	S	SS
5	I found the features of this app easy to understand and use.	STS	TS	N	S	SS
6	I found this app to have too many confusing steps or clicks.	STS	TS	N	S	SS
7	I feel this app helps me reduce repetitive administrative work.	STS	TS	N	S	SS
8	I found it difficult to find the data I needed in this app.	STS	TS	N	S	SS
9	I feel comfortable and confident when using this app for daily checkups.	STS	TS	N	S	SS
10	I don't feel like using this app if there are other options.	STS	TS	N	S	SS

The questions in the questionnaire submitted to users follow the standard guidelines of the System Usability Scale (SUS) method. Score calculations using the SUS method were applied to each respondent individually. Each question in the questionnaire has answer options that cover a scale of 1-5 (ranging from “strongly disagree”, “disagree”, “neutral”, “agree”, to “strongly agree”). The SUS score can range from 0 to 100. If respondents feel that there is no suitable answer option, they are expected to choose the middle value of the test scale (Willyan et al., 2022).

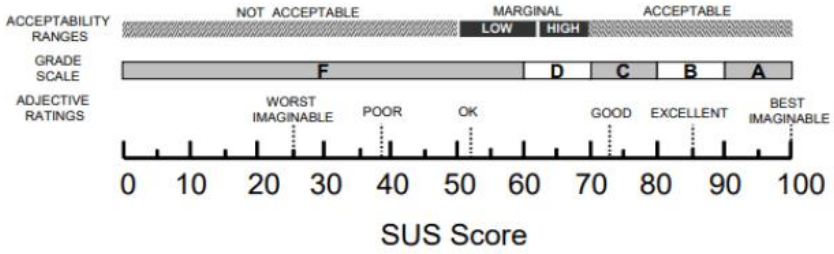

Figure 1. SUS Value Range

Source : Willyan et al., 2022

Results and Discussion

Emphatize

User Identification

The user identification process was carried out through in-depth interviews with five respondents who are members of the OHS medical team of PT Petrokimia Gresik. All interviews were conducted face-to-face to ensure the quality of interaction and obtain more accurate and contextual data. This approach is to explore information directly related to the roles, experiences, and challenges faced by respondents in implementing worker health screening.

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Emphatize

Empathy Map

After the data was obtained through the interview process, the researcher analyzed the responses from five respondents who were part of the OHS medical team of PT Petrokimia Gresik. The results of the analysis were then visualized in the form of an Empathy Map consisting of four main quadrants, namely: says (what is expressed), thinks (what is thought), feels (what is felt), and does (what is done). The following is a description of the Empathy Map based on the results of interviews with five respondents of the OHS medical team of PT Petrokimia Gresik.

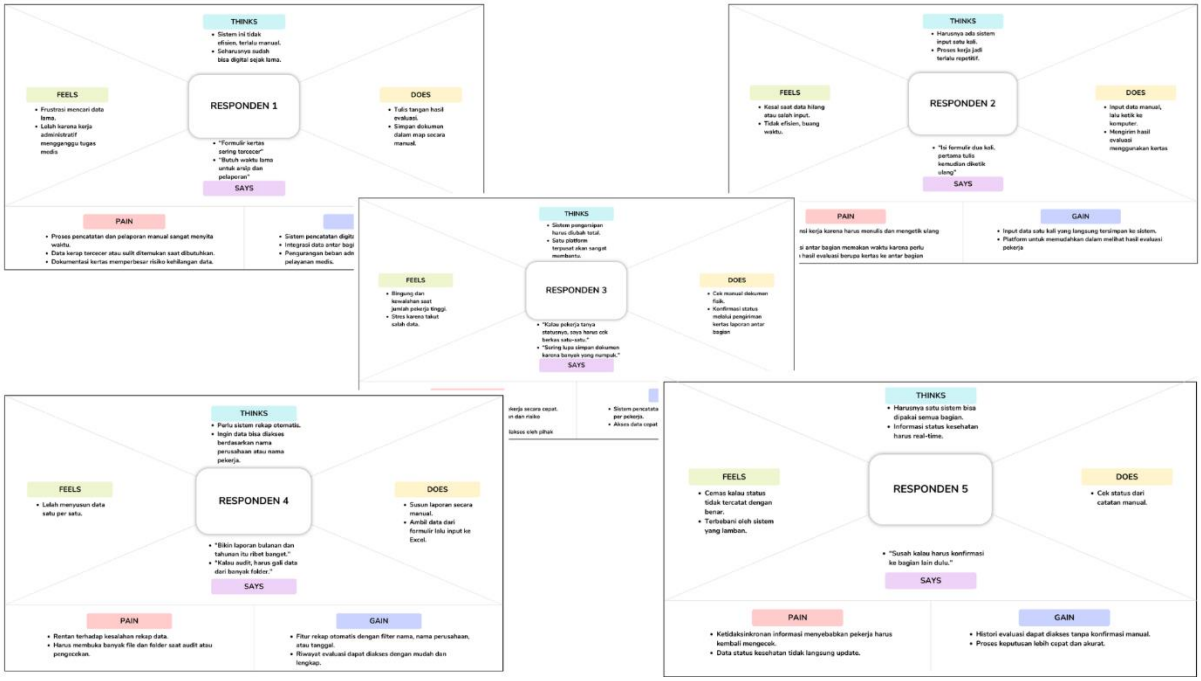

Figure 2. Empathy Map

Says, Feels, Thinks, and Does are concepts used in Empathy Mapping to deeply understand the user experience and perspective in the context of design thinking. Says includes statements expressed by users regarding the system in use. What they say can provide direct insight into how they feel about the problem or the benefits they perceive. Feels focus on the feelings and emotions experienced by users during their interaction with the system. This is important because feelings can greatly influence how users interact with the system and how they assess its functionality. Thinks, on the other hand, describes what goes on in the user's mind. This relates to their perceptions and views which may not be expressed directly, but provides an important insight into their expectations and attitudes towards the system. Does records what users actually do, i.e. their actual actions in using the system. It is an important part of understanding how they practically interact with the system in screening workers' health (Nazar et al., 2024; Verbunt et al., 2022; Llop-Gironés et al., 2021).

Pain refers to the challenges, difficulties, or problems that users encounter when interacting with a product or system. This can include technical, emotional, or inefficient process issues that disrupt the user experience. These pain points are factors that cause frustration, inconvenience, or confusion to users, and are often the main reason why they seek alternative solutions. Gain points refer to the advantages or benefits perceived by users when they interact with the product or system. These gain points include features, advantages, or added values that enhance the user experience and effectively fulfill their needs. Gain points can be efficiency, comfort, ease of access, or increased productivity perceived by the user. Pain and

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Gain are two important concepts in Empathy Mapping that are used to describe the challenges (pain points) and benefits (gain points) that users feel when interacting with a product or system. These two concepts help to understand more clearly what hinders users and what can improve their experience.

Define

In the define phase, the results of the empathize phase are analyzed in depth to systematically formulate the user's functional requirements. This stage also includes the preparation of affinity diagrams, which is a grouping technique that aims to organize various problems (pain) and expectations (gain) of users. Through this process, information obtained from previous interviews or observations is organized into a more structured pattern, so that it can be used as a basis for designing appropriate and relevant solutions to existing problems.

Define

Affinity Diagram

The Affinity Diagram was prepared based on the results of an in-depth interview analysis conducted with five respondents from the OHS medical team of PT Petrokimia Gresik. Through this analysis process, researchers managed to identify a number of pain points (problems) and gains (expectations or needs) experienced by users before the digital health screening application. After all the data was collected, the pain and gain were then grouped based on the similarity of themes or topics of the problems that arose. This process resulted in an Affinity Diagram that helped in formulating user needs in a more structured manner, and became the basis for the Define stage of the Design Thinking method.

Figure 3. Pain Point

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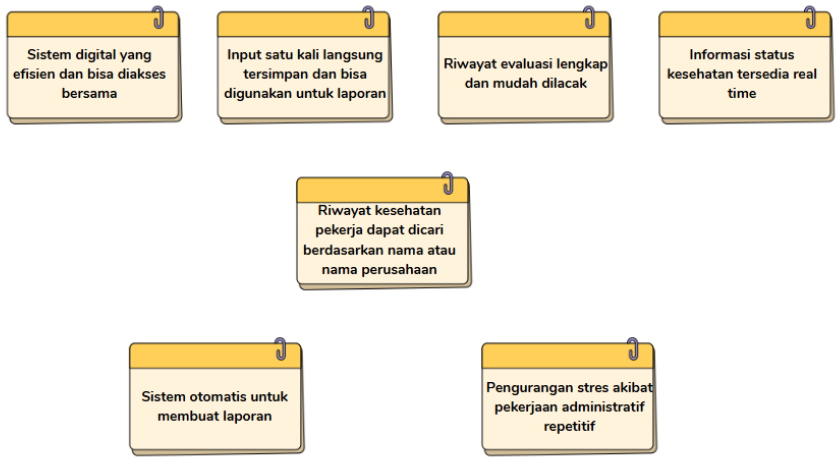

Figure 4. Gain Point

Define

Requirement Analysis

This stage will explain the list of functional and non-functional requirements of the worker health screening application. The resulting analysis is the output of the Empathy Map which identifies pain points and gain points as the basis for formulating user needs in the development of health screening application solutions. Functional Requirements and Non-Functional Requirements are the two main categories used in system analysis and design to define the specifications of what the system should do and how it should function.

Table 4. Functional Requirements of Medical Team

No	Functional Requirements of Medical Team
1	The medical team can log into the health screening application system using a Google account.
2	The medical team can fill in data on the results of worker health checks.
3	The medical team can determine the worker's health evaluation status (Fit to Work, Fit with Note, or Temporary Unfit).
4	The medical team can view the worker's health screening history
5	The medical team can download the evaluation results in the form of a report

Table 5. Non Functional Requirements of Medical Team

No	Non Functional Requirement of Medical Team
1	The system has a simple appearance and is easily understood by medical personnel.
2	The system uses Bahasa Indonesia as the main language.
3	The system is responsive and can be accessed via computers and tablet devices.
4	The system is able to store and display data in real-time and accurately.
5	The system has data security that ensures the confidentiality of workers' health information.

Ideate

The Ideate stage is a strategic stage in the Design Thinking approach which plays an important role in formulating solutions to various problems that have been identified in the previous stages, especially through empathy map analysis and identification of pain points and gain points from the OHS medical team of PT Petrokimia Gresik. This stage aims to develop

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innovative ideas that are able to answer the real needs of users in the process of evaluating worker health.

This stage began with a structured brainstorming session with the OHS medical team as the main users. Each idea was then evaluated based on the criteria of user needs, technical feasibility, and implementation efficiency. Various alternative solutions were developed, then evaluated using certain criteria such as feasibility of implementation, relevance to user needs, and potential for improving work efficiency. The ideas generated were not immediately made into a final decision, but rather went through a selection and iteration process based on input from the medical team and simulated usage scenarios. This approach ensures that the design result is not only oriented towards the final appearance, but also reflects an iterative creative and critical thinking process according to the principles of Design Thinking.

In this context, solution ideas were designed to simplify the health check data input process, increase the speed of access to evaluation result information, and minimize errors in the communication flow between departments. The solution was then outlined in the form of an initial visualization consisting of User Flow, Information Architecture, and Wireframe. User Flow describes the flow of user interaction from opening the application to seeing the final results of the health evaluation. Information Architecture is designed to ensure the navigation structure of the application is logical and easy to use. While Wireframe is used to visualize the initial appearance of the interface, so that the process of validating user needs can be done more effectively.

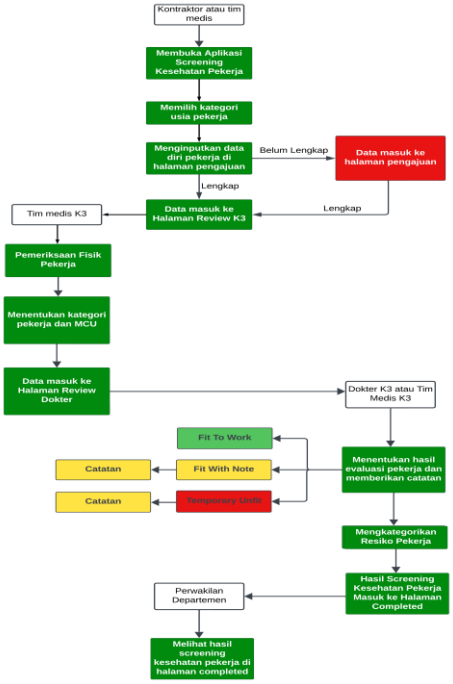

Figure 5. User Flow

This user flow design includes the addition of alternative paths as well as redirection logic that allows the system to provide notifications or additional verification routes when data discrepancies occur. In addition, scenario testing was conducted more thoroughly by involving the medical team to simulate various possible working conditions. This approach aims to increase the system's resilience and flexibility in the face of unexpected situations, while ensuring that the user interface design is able to support real workflows effectively and efficiently in a dynamic operational environment.

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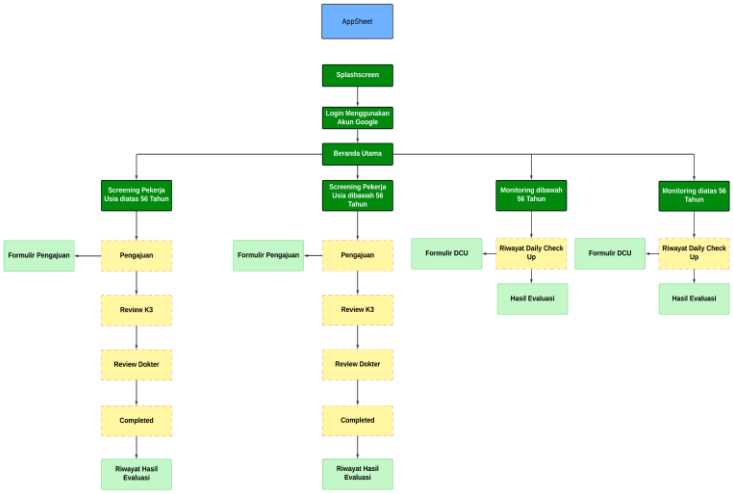

Figure 6. Information Architecture

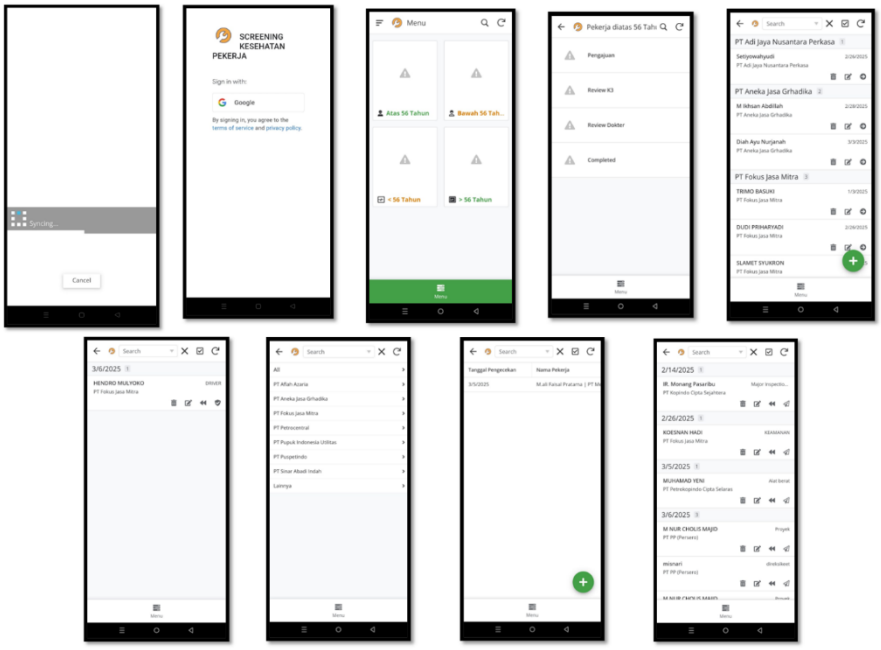

Figure 7. Wireframe

In order to strengthen the validity and relevance of the designed solution, an iteration process was conducted involving the medical team as end users to provide feedback on each design element developed. Evaluation sessions were conducted to test the extent to which the user flow, information architecture, and wireframes were able to reflect the needs and preferences of users in the real context of their work. The feedback obtained became the basis for refining the design to be more adaptive and solutive to the challenges faced in the field. Thus, this approach not only produces technically functional prototypes, but also conforms to the expectations and actual workflows of users, in line with Design Thinking principles that emphasize iteration and continuous collaboration in the solution creation process.

Prototype

In the Prototype phase, various ideas that have been generated and designed as solutions to problems begin to be realized in concrete form. In this phase, a mockup of the application interface is presented, accompanied by a system design that is the main element in developing the interface design. This prototype serves as an initial representation of the proposed solution, so that it can be tested and evaluated before entering the next stage.

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Prototype

Design System

The first step in the prototyping process is to design a design system to ensure consistency in all design elements that will be developed. This system design is the main reference in making the worker health screening application interface. The following is a design system that is used as the basis for designing the application interface.

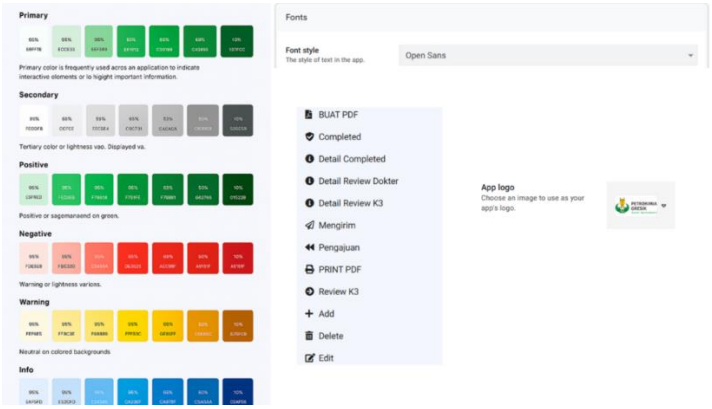

Figure 8. Wireframe

Prototype

Mockup

Once the system design is established, the next step is to create a mockup as a visual representation of the final design. The mockup is created in a high-fidelity form, which means that it looks close to the final version of the application and has fully integrated the elements of the design system that have been designed previously.

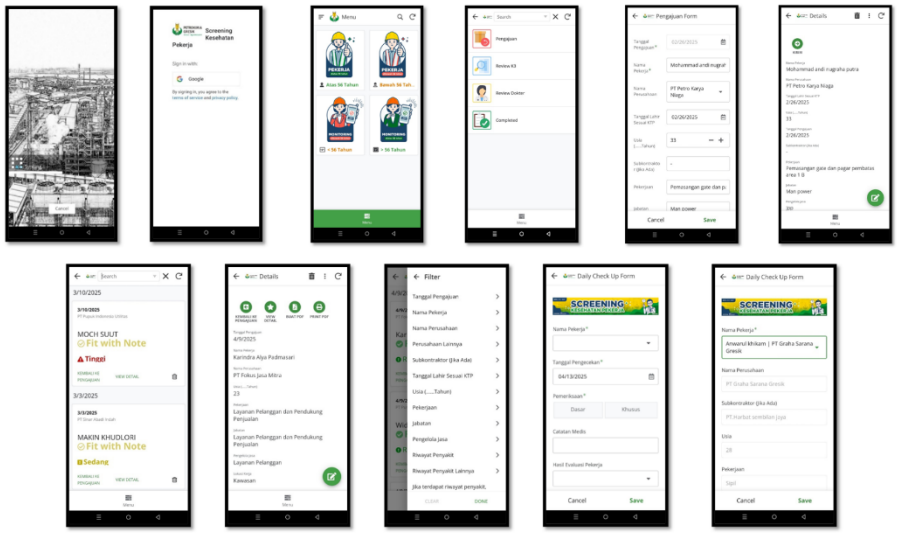

Figure 9. Mockup

This process was carried out through repeated testing of the initial design of the user interface to the main users, namely the K3 medical team, with the aim of obtaining direct feedback regarding aspects of usability, clarity of flow, and interface comfort. Each evaluation result from the test was used as a basis for improving and refining the design, both in terms of visuals and application functionality. Thus, the prototype is not simply developed as a static end product, but rather as the result of a dynamic, iterative process that is responsive to user needs.

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This approach ensures that the final design is not only theoretically feasible, but also practically valid as it has been tested and refined based on real feedback from field users.

Test

System Usability Scale

The System Usability Scale (SUS) is a testing method used to quickly and effectively evaluate the usability of a system, application, or digital product. SUS consists of 10 statements arranged alternately between positive (odd numbers) and negative (even numbers) statements. Respondents are asked to rate each statement on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 6. Calculated Score

No	Question Score SUS										Total	Value (Total *2.5)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	2	4	4	2	4	4	4	4	4	4	36	90
2	4	4	4	4	3	4	4	4	4	4	39	97,5
3	3	3	4	4	4	4	3	4	4	4	37	92,5
4	2	2	4	3	2	2	3	3	4	4	29	72,5
5	3	4	4	4	3	4	4	4	4	4	38	95
6	3	4	4	4	4	4	4	4	4	4	39	97,5
7	4	3	4	4	3	4	4	4	4	4	38	95
8	4	4	4	4	3	4	3	4	4	4	38	95
9	4	4	3	3	2	4	4	4	4	4	36	90
10	3	4	3	4	4	4	4	4	4	4	38	95
Average												**92**

The results of the System Usability Scale (SUS) calculation from 10 respondents show that the average usability value of the worker health screening application is 92. This value is obtained from the conversion of the total score of each respondent multiplied by 2.5 according to the standard SUS calculation method. Referring to the interpretation of the SUS scale, the value of 92 is included in the “Excellent” category, which means that this application has a very high level of usability from the user's perspective.

Test

Usability Testing

At the Usability Testing stage, it will be tested on 5 OHS medical team respondents as in the emphatize stage that has been carried out. Usability Testing will be carried out with several scenarios and the results will be analyzed to determine the time required to use the worker health screening application.

Table 7. Scenario Task

Initial Screening Test Scenario	
No	**Tasks**
1	Login to the health screening app
2	Fill out the form on the submission page
3	Added physical examination results, and worker categories on the OHS review page
4	Added worker evaluation results, worker at risk categories, and notes on the Physician review page
5	Create an inspection report on the completed page

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Source : Processed Data, 2025

The results of usability testing to five OHS medical team respondents are in the form of the effectiveness and efficiency of each task in the scenario that has been made.

Table 8. Scenario Task Test Results of Effectiveness of Early Worker Health Screening

Respondents	Task Scenario					Effectiveness Score	Category
	T1	T2	T3	T4	T5		
R1	1	1	1	1	1	100%	Highly Effective
R2	1	1	1	1	1	100%	Highly Effective
R3	1	0	1	1	1	80%	Highly Effective
R4	1	1	1	1	1	100%	Highly Effective
R5	1	1	1	1	0	80%	Highly Effective
Average Effectiveness Score	**100%**	**80%**	**100%**	**100%**	**80%**	**92%**	

The table above shows that there are only 2 failed scenario tasks. Task scenario 2 has 1 respondent and task scenario 5 has 1 respondent who failed to complete the task. Based on the calculation of the effectiveness value of the Worker Health Screening application on OHS medical team users of 92%. Where according to the standard measure of effectiveness is in the very effective category

Table 9. Test Results of Efficiency of Early Worker Health Screening

Respondents	*Task Scenario*					Total Time (seconds)	*Overall Relative Efficiency Responden*
	T1	T2	T3	T4	T5		
R1	72	365	190	205	110	942	100%
R2	58	375	245	235	130	1043	100%
R3	85	370	205	195	100	955	100%
R4	60	300	210	180	85	835	28%
R5	70	368	250	215	80	983	84%
Total	345	1778	1100	1030	505	4758	82%
Overall Relative Efficiency Task	100%	66%	100%	100%	68%		
	87%					3998	84%

Based on the calculation using Overall Relative Efficiency in the table above, it can be seen that the average efficiency of completing each task scenario by users is 84%. In addition, the average time it takes respondents to complete the screening is 951.6 seconds or 15 minutes 51 seconds. From the results of this analysis, it can be concluded that the Worker Health Screening application has shown a fairly good level of time use efficiency.

Test

Testing Result and Discussion

At the testing stage with the System Usability Scale (SUS) method from 10 respondents, the average usability value of the worker health screening application is 92. Referring to the interpretation of the SUS scale, the value of 92 is included in the "Excellent" category, which means that this application has a very high level of usability from the user's perspective.

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Furthermore, the effectiveness stage shows that there are only 2 failed scenario tasks. Task scenario 2 has 1 respondent and task scenario 5 has 1 respondent who failed to complete the task. The results of the calculation of the effectiveness value of the Worker Health Screening application for K3 medical team users are 92%.

Figure 10. Scenario 2 Task Failure Factor

Task scenario 2 failed because respondents had difficulty finding the form fill button. According to respondents, the buttons are too small and there is no special description.

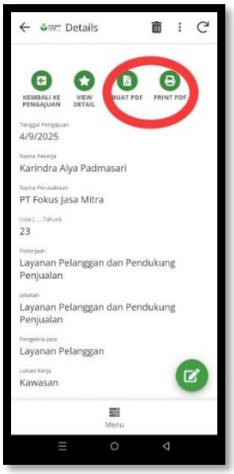

Figure 11. Scenario 5 Task Failure Factor

Task scenario 5 failed because respondents were confused about creating a results report. This happens because there are 2 buttons to create a results report. The (Create PDF) button is used to process the raw data results into a PDF report, then the (Print PDF) button is used to download the report results. Respondents gave suggestions to make only 1 button in making the results report. At the efficiency stage using Overall Relative Efficiency, it can be seen that the average efficiency of completing each task scenario by users is 84%. In addition, the average time it takes respondents to complete the screening is 951.6 seconds or 15 minutes 51 seconds.

Conclusion

The process of designing the user interface of the AppSheet-based Worker Health Screening application with the Design Thinking approach has been successfully carried out by following systematic stages. At the empathize stage, the needs and problems of the main users, namely the OHS medical team of PT Petrokimia Gresik, were successfully identified through in-depth interviews and observations. The define stage formulated the core problem to be solved through this application, while at the ideate stage various ideas and alternative solutions were

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developed to optimize the user experience. The prototype stage produced the visual design of the application, and the test stage was conducted to test the prototype to real users. The results of all these stages prove that the Design Thinking method is effective in producing user interface designs that are relevant, responsive, and oriented to user needs.

Based on the results of the user interface assessment, quantitative evidence was obtained that the developed application showed a very good level of usability. Through testing using the System Usability Scale (SUS), the application obtained an average score of 92, which according to the SUS interpretation standard is included in the Excellent category. This indicates that users feel the ease, clarity of navigation, and comfort when interacting with the application. This high score also reflects that the resulting design is able to meet user expectations regarding the aspects of function, design, and comfort of use. In addition, from the aspect of effectiveness of use, the test results show that the application's effectiveness value reaches 92%, which indicates the level of user success in completing the specified task scenario with minimal errors. This high effectiveness shows that the application can be relied on to support the tasks of the OHS medical team in conducting worker health screening accurately and without experiencing many obstacles. Meanwhile, in terms of efficiency, a value of 84% was obtained, with an average time required for users to complete the entire screening process being 15 minutes 51 seconds compared to the manual method which took 38 minutes. This means that the application is able to speed up the work process compared to the previous manual method, reduce waiting time and minimize unnecessary repetition of steps. In other words, the use of this application makes a real contribution to increasing productivity and saving operational time for the OHS medical team.

Suggestion

This study focuses on usability testing with a one-time interaction session approach. For future research, it is recommended that a more in-depth exploration of user experience be conducted through longitudinal usability testing, in order to understand long-term changes in user behavior towards the application after repeated design iterations.

Based on the results of this study, the application of the Design Thinking method has resulted in an effective interface design. However, future research is recommended to enrich the Ideate and Prototype stages with the exploration of more diverse alternative ideas, as well as conduct more design iteration cycles so that the usability of the application can be continuously improved based on real-time user feedback.

To improve the usability of the application, future research is also recommended to consider using additional evaluation methods such as Heuristic Evaluation or Cognitive Walkthrough in order to identify more potential usability problems from an early stage, so that the final design of the application becomes more intuitive, efficient, and easy to use by various user profiles.

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