

Analysis and Design of UI / UX Sepran Application Using Design Thinking Method

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Abstract

Finance is something that must be thought about from a broader perspective. A low level of financial literacy can result in individuals making financial decisions using only speculation, not according to financial analysis sourced from historical data. If the decision taken turns out to be wrong or inappropriate, it will have an impact on financial health in the future. This statement can be overcome by using several financial management applications that provide features to view historical financial expenses and income in a certain period, one of which is the Sepran application: Expenses Manager. However, this Sepran application still has several shortcomings, such as not being able to connect to an e-wallet so that it can only be input manually, the font size and some icons that still look small, and the colours used in expenses. From these problems, a redesign of the Sepran application will be carried out using the design thinking method approach and the System Usability Scale (SUS) to measure the success rate of the designed interface. Design thinking has 5 stages, namely Empathize, Define, Ideate, Prototype, and Test. The first stage, empathize, is the stage of extracting problems. Define is the stage of defining problems, and ideate is the stage of determining ideas from problems that have been defined at the ideate stage. Furthermore, the prototype is a stage where ideas that have been determined at the ideate stage are implemented into low- and high-fidelity designs. The last is the test stage, where this stage will test using SUS through a prototype to get feedback and find out whether the design objectives have been achieved. The purpose of this research is to redesign the Sepran application to meet user needs and analyze the success rate of the interface using SUS. The results obtained an average score of 93.25 and a grade of A. This score indicates that the redesign of the Sepran application is in accordance with user needs.

Keywords: Redesign, financial application, Design Thinking, System Usability Scale

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I. INTRODUCTION

Sepran is a mobile-based financial application founded in 2019 by Mr Sepran Ashari. This application was developed by the owner himself at Omah Joglo, Gg. Pakel No.35 RT 15 RW 40, Kutu Dukuh, Sinduadi, Kec. Mlati, Sleman Regency, Yogyakarta Special Region 55284. This application can help in recording expenses or income, as well as debts/credits digitally. From the results of the recording, application users can view transaction reports for a certain period. Figure 1 shows the results of a questionnaire distributed by the author to 1000 users, 30 of whom were used for this research material. The selection of 30 users is based on a book entitled "Measuring The User Experience", which states that many people argue that you need a minimum number of participants to start seeing the usefulness of data [1].

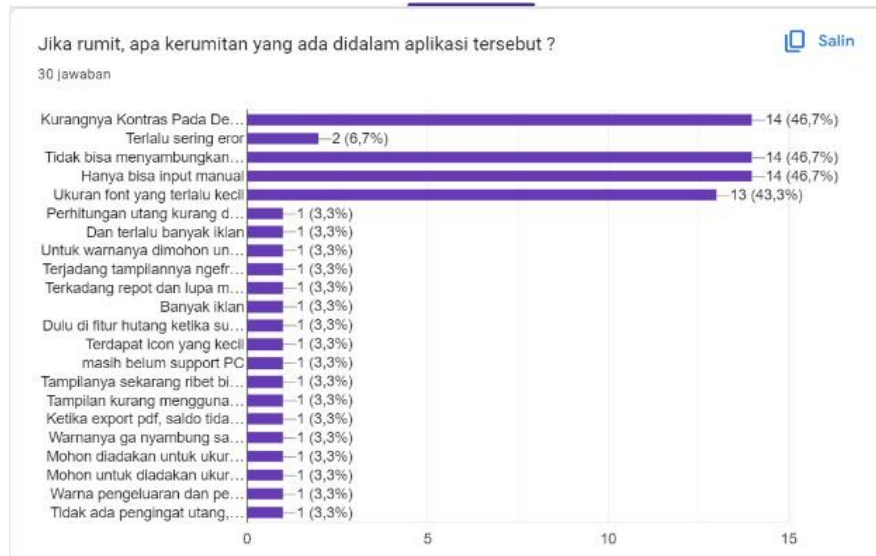


Fig. 1. Questionnaire Results

An evaluation of respondents' feedback regarding the Sepran application, gathered through a structured questionnaire, identified several critical shortcomings. Users highlighted the inability to integrate various e-wallets, which restricts users to manual input of income and expenses. The application also uses black to represent expenses, a choice that respondents felt lacked the necessary visual clarity compared to their preference for red. Additionally, small font sizes and icons were deemed to impair usability and accessibility, further limiting the application's potential to serve as an effective financial management tool [2].

Financial literacy is a fundamental skill that enables individuals to make informed decisions regarding their financial resources. A lack of financial literacy often leads to speculative decision-making without proper financial analysis based on historical data, potentially causing adverse impacts on financial health over time. Applications such as Sepran: Expenses Manager aim to address these challenges by providing users with tools to review and analyze their financial history, including income and expenses. However, as noted, Sepran's limitations—lack of e-wallet integration, insufficient visual differentiation for expenses, and usability concerns—hinder its effectiveness and user satisfaction [2].

To overcome these challenges, this study aims to redesign the Sepran application using methodologies grounded in user-centred design principles. The primary methodology employed is Design Thinking, a user-centric approach that encourages creative problem-solving and iterative feedback. Design Thinking focuses on understanding user needs, brainstorming innovative solutions, and developing and testing prototypes until the most effective and efficient solution is achieved. This method is particularly advantageous due to its adaptability and speed in addressing user requirements and refining design solutions [3][4].

Additionally, the redesigned application will be evaluated using the System Usability Scale (SUS), a well-established tool for measuring usability. The SUS provides a quantitative measure of the system's effectiveness, efficiency, and satisfaction, offering critical insights into the success of the redesigned interface. Other user-centred design methodologies, such as User-Centered Design (UCD), were considered. UCD focuses on integrating one or more users into the design process, emphasizing factors such as gender or age range to ensure the design is inclusive and accessible to the target audience [2]. While UCD offers valuable insights into user-specific needs, Design Thinking's iterative and creative problem-solving approach was chosen for its ability to develop and test multiple solutions quickly.

The overarching aim of this research is to enhance the Sepran application's usability and functionality, enabling it to better support users in managing their financial health. By addressing the identified shortcomings and employing robust design methodologies, the redesigned application seeks to improve user experience, facilitate better financial decision-making, and promote financial literacy. This research also provides a framework for designing financial management applications that prioritize user satisfaction and accessibility.

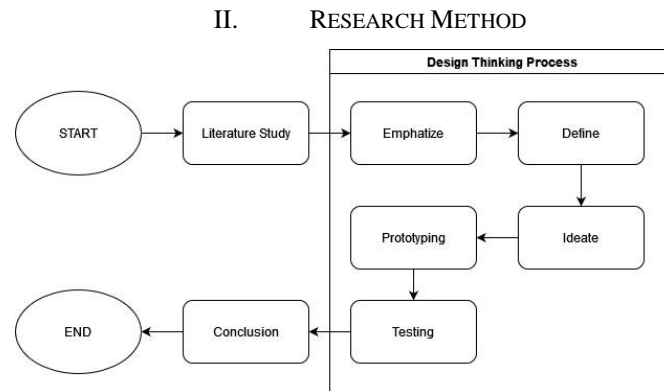


Fig. 2. Design Thinking Method

This application redesign methodology uses the design thinking method and the system usability scale (SUS) to assess the success rate of the interface that has been designed, as explained in Figure 2. There are several application redesign methodologies, including user-centered design (UCD) and design thinking. The UCD method is a design method that places one or more users in the system design process. UCD focuses on understanding potential users by considering certain factors, such as gender or age range [2]. The UCD question items can be seen in Table I. The Design Thinking Method is an approach to solving problems analytically through a creative process that encourages users to experiment, design and create solutions to the problem and get the most efficient and effective feedback [3]. Design thinking is considered fast in developing and testing several solutions that will be carried out until the last stage [4].

A. *Empathize*

The initial stage in design thinking is empathize. In this stage, an approach is made to product users to gain an understanding of user needs [5]. Empathy is the skill of understanding what another person is going through, seeing from that person's point of view, and imagining oneself in that person's shoes. This method seeks to understand the problems experienced by users so that we can feel and find solutions to existing problems [6].

B. *Define*

In the context of Design Thinking, according to DailySocial, the Define stage refers to the interpretation of data that has been collected about user problems in the previous stage, namely empathize. In this stage, the previously collected data is carefully organized to form a structured flow. This process includes the creation of a User Persona, User Journey Map, and challenge matrix to detail the information obtained [7].

C. *Ideate*

The Ideate stage involves the process of brainstorming ideas to address unmet user needs based on the identification results at the Define stage. In this research, the ideas generated will be implemented in the form of a prototype on a platform known as Design System.

D. *Prototype*

Prototype is a design process that implements ideas that have been determined at the ideate stage. In this stage, it produces a low-fidelity design and a high-fidelity design.

E. *Testing*

This stage is done through testing prototypes with users to get feedback and assess the achievement of design goals. In this test, the system usability scale method is used. SUS has ten default standard questions, and it provides a reliable and rapid assessment of user satisfaction and ease of use. SUS is particularly beneficial in usability testing, user experience evaluation, and product development, where an understanding of users' perceptions of usability will guide design refinements, quality assurance

TABLE I. QUESTION ITEM

No	Question Item
1	I think I will use this system again
2	I find this system difficult to use
3	I find the system easy to use
4	I need help from other people or technicians in using this system.
5	I feel that the features of this system are working properly.
6	I feel that there are many inconsistencies in the system.
7	I feel others will understand how to use the system quickly
8	I find this system confusing
9	I feel there are no obstacles in using this system
10	I need to familiarize myself before using this system.

III. RESULTS AND DISCUSSION

A. Empathize

Several problems were found in the Sepran application during this problem exploration stage. The following are the problems obtained :

1. You cannot connect various e-wallets in the application, and there is only manual input of income and expenses.
2. The dispensing color is black, while the user needs to use red
3. Font Size and icon are too small

B. Define

This defined process is a process obtained from exploring the problems that have been explored at the empathize stage through interviews, which resulted in several pain points, as shown in Figure 3:

1. Pain Point

Pain Point can be explained that there are pain points obtained from interviews with Sepran application users as follows:

- a. Lack of contrast in the design
- b. Unable to connect e-wallet and M-Banking
- c. The production color is black, while the user needs red
- d. There are some small icons
- e. Lots of advertisements

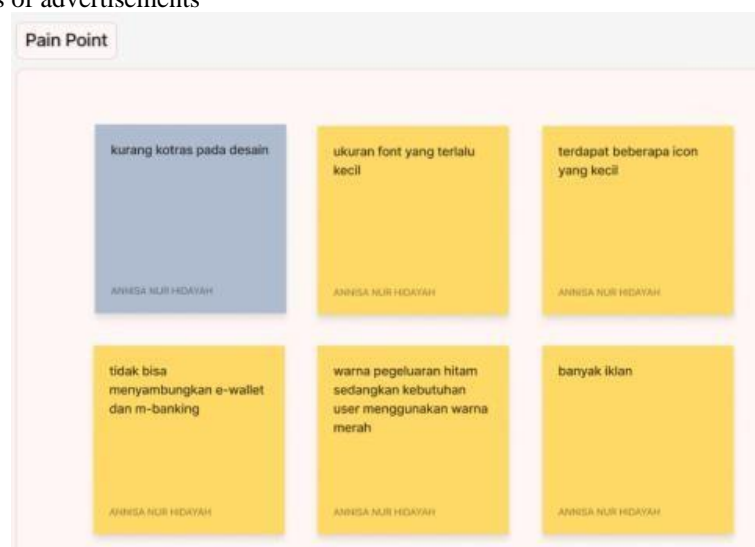


Fig. 3. Pain Point

2. Affinity Diagram

The affinity diagram is a useful tool to organize and categorize user feedback and insights into meaningful themes for better understanding and problem-solving. In this research, the feedback is grouped into three main categories: Fitur, Tampilan, and Text. This diagram can be seen in Figure 4.

The Fitur category includes user suggestions and issues related to the application's features, such as the need for integration with e-wallets, automatic categorization of expenses, and the ability to generate detailed financial reports. Users emphasized the importance of these features to streamline their financial management and reduce their reliance on manual inputs.

The Tampilan category focuses on the visual appearance of the application, such as the use of colors, icons, and layout design. For example, respondents highlighted that expenses should be displayed in red rather than black to improve clarity and visual distinction. Additionally, small font sizes and icons were cited as a significant concern, making it difficult for users to navigate and interact with the application effectively.

The Text category includes feedback on the language, readability, and formatting of textual elements within the application. Users expressed the need for clearer and more concise labels, as well as the inclusion of instructional text to guide them in using the application's features. Ensuring the text is legible and contextually appropriate was identified as critical for enhancing user understanding and satisfaction.

By organizing feedback into these categories, the affinity diagram provides a structured approach to identifying and addressing user concerns, guiding the redesign process to prioritize usability and functionality.

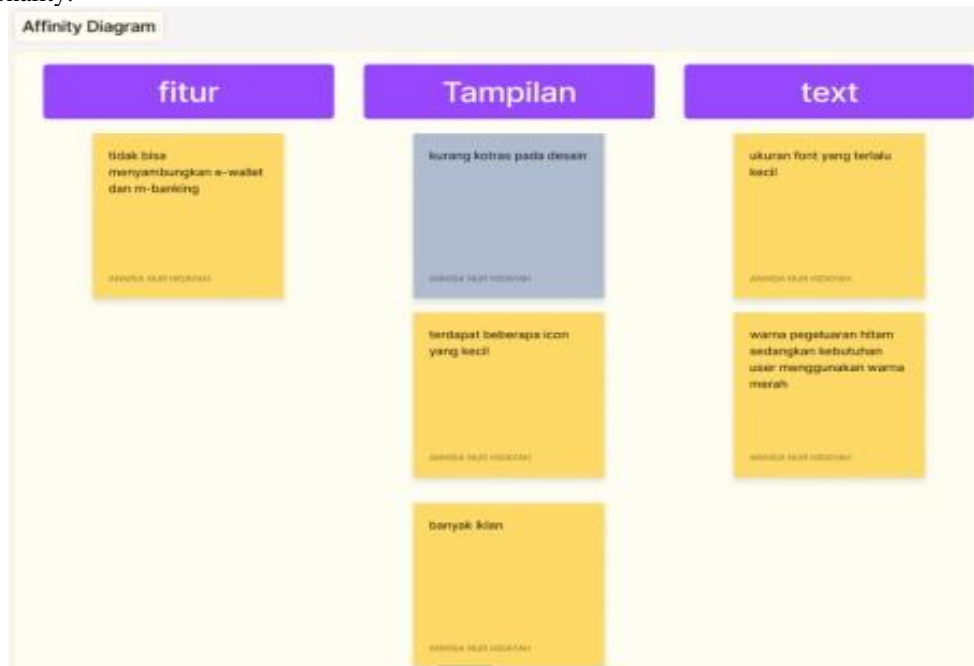


Fig. 4. Affinity Diagram

3. How Might We

The "How might we" statement opens up opportunities for creative thinking and finding new solutions to problems or challenges. The following are the how might we that were obtained:

- How do we solve e-wallet and m-banking that cannot be connected to the Sepran application?
- How do we optimize the design according to user needs?
- How about the text used? Is it appropriate in terms of colour and size?

C. Ideate

In the Ideate phase, ideas are systematically developed to address the identified problems and improve the user experience. This phase begins with brainstorming Solution Ideas and organizing them into a structured Solution Matrix, which serves as the foundation for further design steps. The steps within this sub-section include:

1. Solution Ideas

Initial solutions are brainstormed to address the usability and functional issues identified in the previous stages. These ideas aim to enhance the application's core functionalities, such as integrating e-wallets, improving visual clarity, and creating user-friendly interfaces.

2. Solution Matrix

The generated solution ideas are then organized into a Solution Matrix. This matrix categorizes and prioritizes the ideas based on their feasibility, user impact, and alignment with project goals. This step ensures that the most effective solutions are identified for implementation. This can be seen in Figure 5.

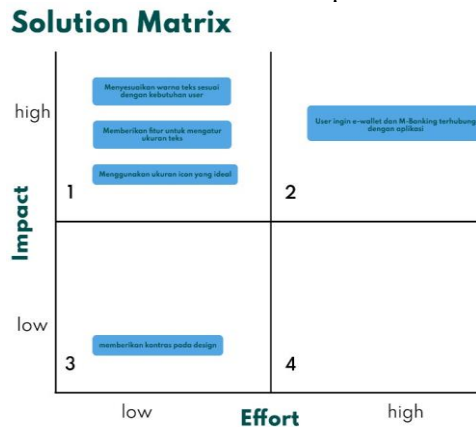


Fig. 5. Solution matrix

3. Information Architecture

At this stage, an information architecture is created to help users find information quickly and easily, understand the relationship between various pieces of information, and navigate the system efficiently. The information architecture for the Sepran application in Figure 6 establishes the foundation for intuitive navigation and logical connections between features, making the application more user-friendly and efficient.

Information Architecture

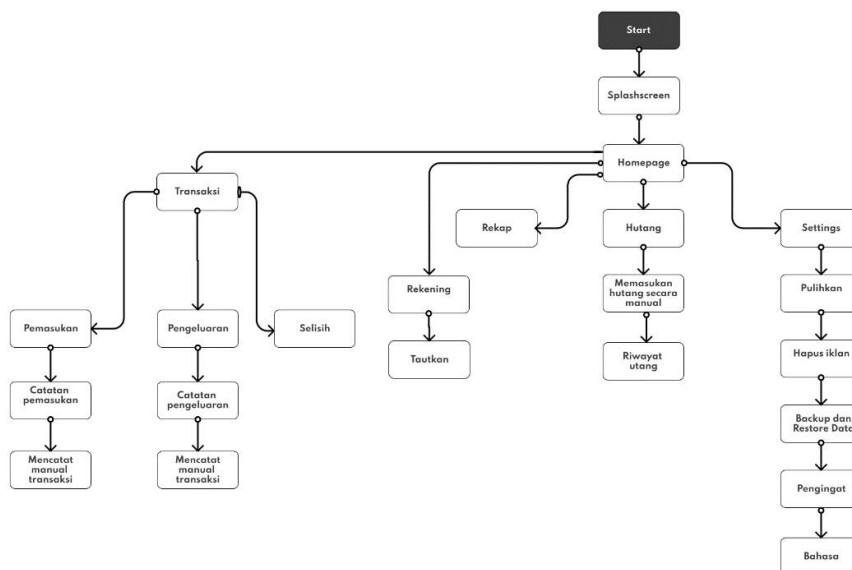


Fig. 6. Information Architecture

4. Wireframe

Based on the information architecture and solution matrix, wireframes are developed to visualize the application's layout and functionality. These wireframes translate the solution ideas into practical designs that align with user needs:

1. Wallet Menu Wireframe

As shown in Figure 7, the wallet menu wireframe illustrates a page where users can connect e-wallets and mobile banking by clicking the "Add" button in the bottom-right corner. This design simplifies financial management by automating transactions and syncing external account data.



Fig. 7. Wallet menu wireframe

2. Settings Page Wireframe

Figure 8 presents the settings page wireframe, which allows users to customize the application's display. Users can adjust visual elements such as colors, fonts, and icon sizes to improve accessibility and enhance their overall experience.

By systematically following these steps, the **Ideate** phase ensures that the redesign process is grounded in user-centric solutions, transforming ideas into actionable designs that directly address the application's shortcomings and enhance its usability.



Fig. 8. settings page

D. Prototype

In this stage, the wireframes developed during the previous phase are transformed into high-fidelity designs to create a more realistic and visually appealing representation of the application. These high-fidelity designs are interactive, with pages linked to demonstrate functionality, resulting in a prototype. The prototype serves as a demonstration tool to visualize the final user interface and its capabilities. By visualizing these high-fidelity designs, the prototype offers an interactive and practical demonstration of

the application's functionalities. This stage bridges the gap between concept and implementation, ensuring that user feedback is incorporated into the final design while providing a clear roadmap for development. Below are the results of the high-fidelity design:

1. Transaction Page

The redesigned transaction page in Figure 9 provides a more user-friendly and visually appealing layout. Key improvements include appropriately sized icons for better accessibility and clarity. Income figures are displayed in green, while expenses are highlighted in red, ensuring quick differentiation and enhancing usability for financial tracking.



Fig. 9. Transaction Page

2. Account Page

The account page in Figure 10 has been redesigned to integrate e-wallet and mobile banking (M-Bank) accounts seamlessly. Users can now view connected accounts directly on the page, eliminating the need for manual input. Additional accounts can be easily added by clicking the "Add" button located at the bottom-right corner, making the process intuitive and efficient.



Fig. 10. Account Page

3. Settings Page

The settings page in Figure 11 introduces features for adjusting text size within the application. This redesign prioritizes accessibility, allowing users to customize text sizes to suit their preferences, thereby improving readability and user satisfaction.



Fig. 11. Settings Page

E. Testing

At this stage, testing is carried out using the System Usability Scale by sending a questionnaire to 30 respondents who are the same as the problem exploration questionnaire at the empathize stage. Table II shows the results of the SUS questionnaire using the System Usability Scale.

TABLE II. SUS RESULTS

Code	Score Results										Accumulation	Final Results x 2.5
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
R1	4	4	3	4	4	3	4	4	3	3	36	90
R2	4	4	3	4	4	3	4	4	4	4	38	95
R3	3	3	4	4	4	4	4	4	4	3	37	92.5
R4	4	4	4	4	4	4	4	3	4	4	39	97.5
R5	4	3	4	4	4	4	4	4	4	0	35	87.5
R6	4	4	4	4	4	4	4	4	4	4	40	100
R7	4	4	4	4	4	4	4	4	4	4	40	100
R8	4	4	4	4	4	4	4	4	4	4	40	100
R9	4	4	4	4	3	3	4	4	0	4	34	85
R10	4	4	4	2	3	3	4	4	3	4	35	87.5
R11	4	4	4	4	4	4	4	4	4	4	40	100
R12	4	3	3	4	4	4	2	4	4	4	36	90
R13	4	4	4	4	4	4	4	4	4	4	40	100
R14	4	4	4	3	4	4	4	4	4	4	39	97.5
R15	4	3	3	4	4	4	4	4	4	4	38	95
R16	4	4	3	4	4	4	4	3	4	4	38	95
R17	4	4	4	4	4	4	4	4	4	4	40	100
R18	4	4	4	3	4	3	4	3	4	4	37	92.5
R19	4	4	4	4	4	3	3	4	4	4	38	95
R20	4	4	3	4	4	4	3	3	4	4	37	92.5
R21	4	4	3	3	4	4	4	3	4	4	37	92.5
R22	4	4	4	3	3	4	4	4	0	1	31	77.5
R23	4	4	4	4	4	4	4	4	4	4	40	100
R24	4	4	4	3	4	4	4	3	4	0	34	85
R25	4	4	4	3	4	4	4	4	3	4	38	95
R26	4	4	3	4	4	4	4	4	4	4	39	97.5
R27	4	4	4	3	4	4	4	4	4	4	39	97.5
R28	4	4	4	4	4	4	4	4	4	4	40	100
R29	4	3	4	4	3	4	4	4	4	4	38	95
R30	4	3	3	4	4	4	4	4	4	4	38	95
Average Scores												93.25

Based on the usability testing that has been carried out, an average score of 93.25 is obtained, and according to the score scale table, it gets an A grade. This score indicates that the redesign of the Sepran application is in accordance with user needs.

IV. CONCLUSION

The conclusions drawn from this research highlight the effectiveness of using the Design Thinking methodology and System Usability Scale (SUS) testing in addressing user-centred problems. The Design Thinking approach, which combines creative and analytical problem-solving by placing the designer in the user's perspective, proved to be an effective method for tackling the challenges identified in the Sepran application. Furthermore, usability testing conducted with 30 respondents using the SUS method yielded an impressive average score of 93.25, achieving a grade of A. This high score indicates that the redesigned interface is not only user-friendly but also effectively addresses the issues faced by users, demonstrating the success of the proposed solutions in improving the overall user experience.

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REFERENCES

- [1] B. Albert and T. Tullis, *Measuring The User Experience*, First Edit. 2018.
- [2] M. Multazam, "Perancangan User Interface dan User Experience pada Placeplus menggunakan pendekatan User Centered Design," *Univ. Islam Indones.*, vol. 1, p. 8, 2020, [Online]. Available: <https://journal.uui.ac.id/AUTOMATA/article/view/15528/10233>
- [3] H. A. Ramadhan and G. F. Fitriana, "Desain Aplikasi Seluler untuk Menemukan Tempat Magang Menggunakan metode Design Thinking," vol. 16, no. 1, pp. 162–174, 2022.
- [4] S. S. Rosyda and I. Sukoco, "Model Design Thinking pada Perancangan Aplikasi Matengin Aja," *Organum J. Saintifik Manaj. dan Akunt.*, vol. 3, no. 1, pp. 1–12, 2020, doi: 10.35138/organum.v3i1.69.
- [5] Z. Zakiya Maulidia and R. Andrian, "Perancangan Website Majalengka Saber Hoaks dalam Mendukung Proses Verifikasi Informasi dengan Menggunakan Metode Design Thinking The Design of Majalengka Saber Hoaks Website in Supporting the Information Verification Process Using Design Thinking Method," *J. Teknol. dan Inf.*, vol. 13, pp. 17–28, 2023, doi: 10.34010/jati.v13i1.
- [6] R. Maulina, A. Dumyati, S. Wahyuni, I. I. Hidayat, R. Sataria, and M. R. Pribadi, "Pembuatan User Interface Layanan Aplikasi Komik Online Menggunakan Metode Perancangan Design Thinking," *MDP Student*, pp. 413–420, 2022, [Online]. Available: <https://jurnal.mdp.ac.id/index.php/msc/article/view/1792>
- [7] Irwansyah, D. Juardi, and R. Ardian, "Penerapan Metode Design Thinking Pada Model Perancangan UI Dan UX Aplikasi Keuangan Berbasis Mobile," *J. Ilm. Wahana Pendidikan, Mei*, vol. 2023, no. 10, pp. 80–91, 2023, [Online]. Available: <https://doi.org/10.5281/zenodo.7983315>