E-WALLET FINE.NANCE: IMPLEMENTING DESIGN THINKING METHOD IN THE DEVELOPMENT OF AI FEATURES

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ABSTRACT

This research explores the application of the Design Thinking method in developing innovative features for the FINE.NANCE application, an AI-integrated e-wallet serves as a financial management tool aimed at enhancing user experience and promoting financial literacy. The study identifies the complexities of personal financial management and the increasing use of e-wallets, emphasizing the need for solutions that address these challenges. Using the Design Thinking Method, which consists of five different stages,: Empathize Stage, Define Stage, Ideate Stage, Prototype Stage, and Test Stage. The research collected insights through surveys, interviews, and group discussions, involving more than 32 respondents. The analysis highlights user feedback on proposed features, such as financial statement analysis, wish-to-buy, invoice scan, and spending limits, to refine the application's design and functionality. The result of this research suggest that incorporating user- centered methodologies and AI capabilities can effectively address financial management issues, demonstrating the potential of FINE.NANCE to provide practical and innovative solutions. This study underscores the importance of aligning technological advancements with user needs to foster engagement and long-term adoption.

Keywords: Finance, E-wallet, SDG 8, Decent Work and Economic Growth, SDG 12, Responsible Consumption Production, Artificial Intelligence, Fin-tech

1. INTRODUCTION

The development of business plan studies has evolved significantly over the past few decades, transitioning from traditional models to more dynamic and innovative frameworks. Initially, business planning focused on static documents that outlined financial projections and operational strategies. However, contemporary studies emphasize the importance of adaptability and responsiveness to market changes, integrating concepts such as design thinking and agile methodologies to enhance business viability and innovation (Cao et al., 2021). This shift reflects a broader understanding that effective business planning must account for rapid technological advancements and changing consumer behaviors, particularly in sectors like fintech, where the pace of change is exceptionally fast (Zavolokina et al., 2016; Cao et al., 2021).

In the fintech industry, the evolution of business studies has been particularly pronounced. The integration of technology into financial services has transformed traditional banking models, leading to the emergence of new business paradigms that prioritize customer experience and operational efficiency (Kurniasari et al., 2023; Peong et al., 2021). Research indicates that fintech innovations, such as mobile payment solutions and AI-driven financial management tools, are reshaping how consumers interact with financial institutions (Bulkhairova et al., 2023). As fintech continues to grow, there is an increasing need for robust business plans that not only address current market demands but also anticipate future trends and challenges (Saliger et al., 2020; Xiong, 2024). This evolution underscores the critical role of strategic planning in navigating the complexities of the fintech landscape.

For FINE.NANCE, the urgency of effective business planning is underscored by the competitive nature of the fintech market. As consumers increasingly seek seamless and intelligent financial solutions, the development of a smart e-wallet app that integrates AI features becomes paramount (Nangin et al., 2020; Nandiroh, 2024). A well- structured business plan will not only facilitate the identification of target markets and customer needs but also guide the implementation of innovative technologies that enhance user engagement and satisfaction (Svirina et al., 2021; Wang et al., 2023). Moreover, the integration of design thinking into the planning process allows for a user-centered approach, ensuring that the app's features align with the evolving expectations of users (Flaminiano & Francisco, 2021; Habtay, 2012).

The application of action research methods presents significant opportunities for innovative business planning in the fintech sector. This approach fosters a collaborative environment where stakeholders can engage in iterative cycles of planning, action, and reflection, leading to continuous improvement and adaptation (Jinasena et al., 2020; Ryu, 2018). By

utilizing action research, FINE.NANCE can leverage real-time data and user feedback to refine its business model and enhance the app's features, ultimately driving user adoption and satisfaction (Majid, 2021). This methodology not only supports the development of a responsive business plan but also encourages innovation to be implemented inside the organization.

Previous studies on business plans in the fintech sector have highlighted various strategies and frameworks, yet there remains a notable research gap concerning the specific application of action research in developing innovative business plans for smart e-wallet applications like FINE.NANCE. Existing literature often focuses on broader fintech trends or specific technological advancements without delving into the practical implications of action research methodologies (Xiong, 2024). The objective of this research is to fill this gap by developing an innovative business plan for the fintech industry that utilizes action research, supported by generative AI text-to-image technology. This approach aims to create a comprehensive framework that not only addresses current market needs but also positions FINE.NANCE as a leader in the evolving landscape of financial technology.

Literature Review

In conducting this research, there are some theoretical information and knowledge related to the research. These theoretical knowledge will help us to compose an appropriate and good research.

- **Definition of Finance**

Finance is the study of how individuals, companies, and governments manage their financial resources to achieve specific goals. According to Gitman and Zutter (2015), finance involves decision-making related to investments, funding, and asset management. Personal finance, as one of its branches, focuses on managing income, expenses, and savings to achieve financial stability and security.

- **Financial Technology (Fin-Tech)**

Fintech refers to technological innovations in the financial sector aimed at providing more efficient and accessible financial services. Arner et al. (2015) define fintech as the application of technology in financial services, encompassing digital payments, investments, lending, and financial management. In the context of modern society, fintech not only provides convenience but also promotes financial inclusion by reaching populations previously underserved by traditional financial institutions.

- **Design Thinking Method**

Design Thinking Method is a human-centered and solution-based approach in order to solve complex problems. According to Brown (2009), the design thinking process involves five stages: *Empathize, Define, Ideate, Prototype, and Test*. This method is often used in the development of innovative products and services because it emphasizes a deep understanding of user needs and continuous iterations to ensure relevant solutions.

- **Artificial Intelligence Technology**

Artificial Intelligence (AI) is a branch of computer science that creates systems or machines capable of performing tasks that typically require human intelligence, such as voice recognition, natural language processing, and decision-making. According to Russell and Norvig (2020), AI encompasses various techniques, such as machine learning, deep learning, and natural language processing, enabling systems to learn from data and improve their performance over time. In the context of e-wallets, AI can be utilized to analyze user spending patterns, provide budget recommendations, and detect suspicious financial activities.

- **Data Collection using Surveys/Questionnaires**

Data collection through surveys or questionnaires is one of many common research method that can be used to gather information from a vast number and variety of respondents. According to Sugiyono (2015), a questionnaire is a research instrument containing a series of closed or open-ended questions designed to collect quantitative or qualitative data. This method offers advantages in terms of time and cost efficiency, as well as the ability to reach respondents across geographical locations. The validity and reliability of the questionnaire are crucial to ensure the quality of the data obtained.

- **Relevance of Concepts to FINE.NANCE**

Definition of Finance

FINE.NANCE aims to enhance financial literacy by providing tools that support personal financial management.

Fin-Tech

As an AI-based e-wallet, FINE.NANCE is part of the fintech ecosystem, combining technology to deliver innovative financial services.

Design Thinking Method
This approach is applied in the development of AI features to ensure the solutions offered truly address user needs.

Artificial Intelligence Technology
AI serves as the core of FINE.NANCE's innovations, such as expense analysis, financial predictions, and budget recommendations.

Data Collection Using Surveys/Questionnaires
User data collected through surveys will serve as the basis for developing relevant and effective features.

This literature review serves as a theoretical foundation to support the research and development of the FINE.NANCE business idea, aiming to deliver positive impacts to society.

2. METHODS

This research started with discussion on a business idea that is relevant, needed by the community, and able to solve the problems faced by the community today. One of many ways to acknowledge and decide what problem that can be focused on, can be obtained by looking towards the SDGs (Sustainable Development Goals), a program created by the UN (United Nation) in order to improve and promote sustainabilty of human's life. To be more specific, one of many problem being focused can be found in SDG Number 8, Decent Work and Economic Growth, which focused towards sustainability in economic sector. Among the broad topic of economical problems, one that can be considered as important and stood out, is about money management. Money management is one of the most important thing in human's life, as it is being used, practically, every single day. Without a proper money management, a person might not be able to fulfill their needs and wants optimally. One of many noticeable problem about money management is how complicated it is. A person need to understand and take note of every single detail of their income and outcome throughout the day. Not to mention, the usage of e-wallet technology may increase the chance of someone to spend more money due to how easy it is to perform transaction using the e-wallet application. Given this problem, we decided to propose a solution to the problem by developing an e-wallet application focused on helping its user with their financial management, the FINE.NANCE application. FINE.NANCE is an AI integrated application designed to promote and help its user with their financial management while still serve as a regular e-wallet application. This means that the application will have the same features as any regular e-wallet application such as payment, transfer, etc. In order to fulfill the goal of promoting and helping its user with their financial management, there will also be additional unique support features, such as, invoice scan, spending limit, wish-to-buy, and financial statement analysis with the help of AI. To find out whether this idea is relevant with users, a survey had been conducted using Google Form. The survey aimed to collect feedbacks from respondents regarding the idea and implementation of FINE.NANCE application to solve the appointed problem. The result of the survey is then presented in the form of an article to provide more scientific contributions and to support further development of FINE.NANCE application to better suit the user's needs and solve their problems.

The research method used to make the article that will be used to develop FINE.NANCE application is Design Thinking Method, which consists of five main stages: Emphatize, Define, Ideate, Prototyping, and Testing, which is a method focused and being centered on users to create an innovative solutions. The first stage is the Emphatize Stage, which was focused on understanding the needs and problems faced by the community by doing interviews, group discussion, and observation. This stage is an important stage to acknowledge what kind of problem is being faced by the community and how much the problem are related to their daily lives. The second stage is the Define Stage, which was focused on analyzing and finding the problem. After the problem has been identified, we move to the next stage, the Ideate Stage, which was focused on generating ideas and also making potential solutions to solve the identified problem. This particular stage ensure that the solutions and ideas given are actually related and based on a real problem faced by the community. After selecting and deciding on the best idea and solution, we got to the next stage, Prototype Stage, which was focused on realizing the ideas of the FINE.NANCE application in the form of simple application model for the users to test to better understand the concept, flow, and find any misalignment the application had with the users. The data collected from the previous stage would then be carried out and used to improve the prototype of the application. The last stage is the Test Stage, which was focused on collecting more information. Using the questionnaires, up to 32 students of BINUS Malang gave out their thoughts and opinions on the idea of FINE.NANCE application. This stage allow us to gain more information to further suit and improve the FINE.NANCE application to fit and meet the needs of the users.

3. RESULTS AND DISCUSSION

The questionnaire conducted on 32 students of BINUS Malang used the questions related to Design Thinking Method which help in gaining information on what part of the idea to improve. The questionnaire used the likert scale (1 – 5) to help the respondents to determine whether or not a variable or part of the idea needed improvement. The questionnaire was conducted using Google Form, which some of the questions can be seen in **FIGURE 1**, **FIGURE 2, FIGURE 3, FIGURE 4, FIGURE 5, FIGURE 6** and **FIGURE 7.**

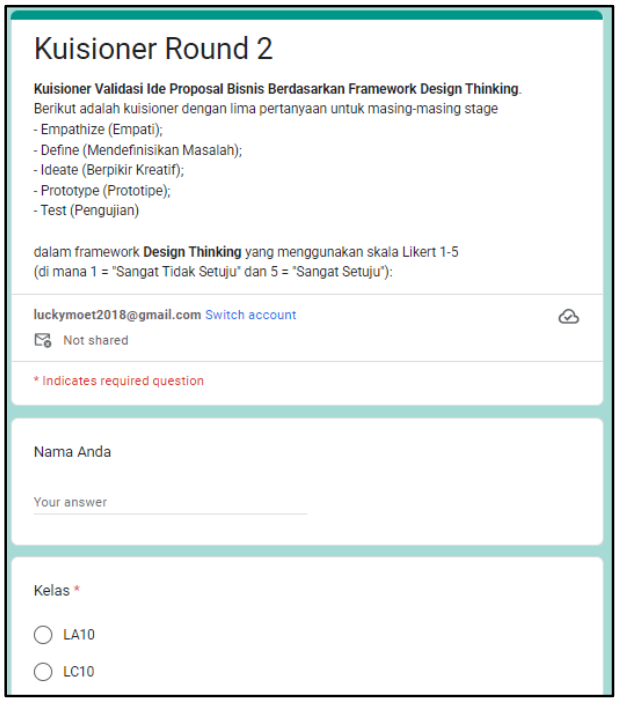

FIGURE 1. Heading and Identification

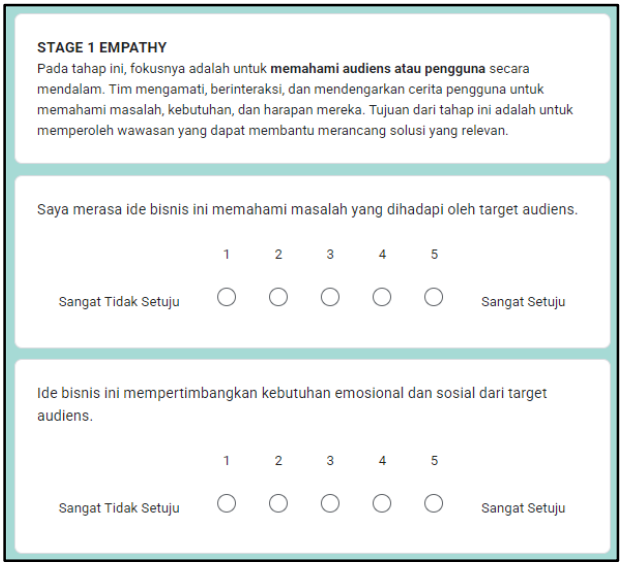

FIGURE 2. Example of Empathy Stage's Questions

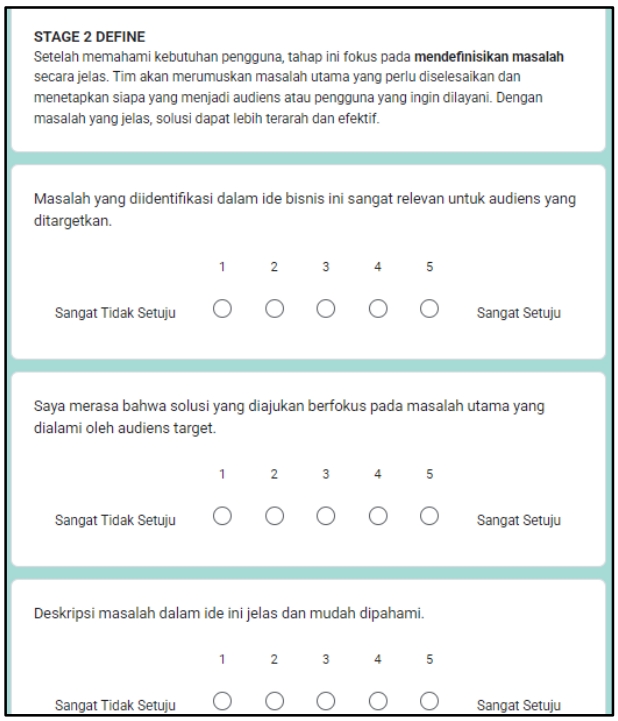

FIGURE 3. Example of Define Stage's Questions

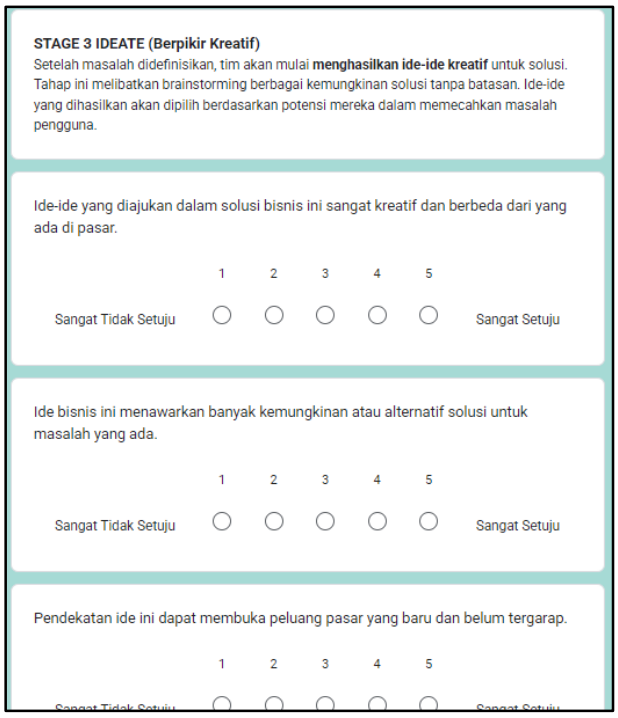

FIGURE 4. Example of Ideate Stage's Questions

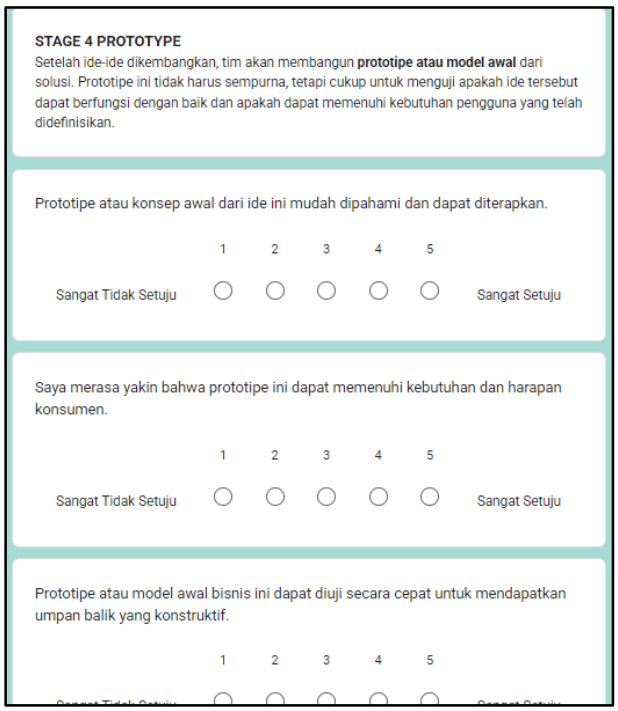

FIGURE 5. Example of Prototype Stage's Questions

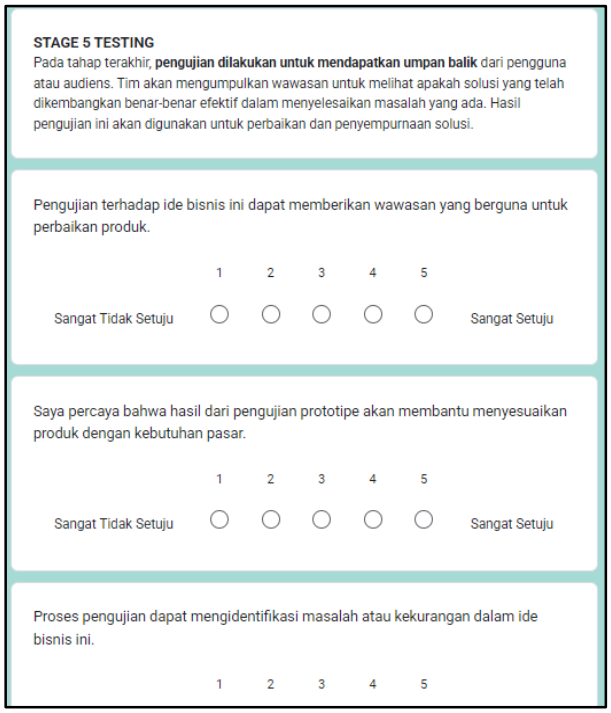

FIGURE 6. Example of Testing Stage's Questions

FIGURE 7. Question Regarding Investment

After the questionnaire has been conducted, the result of the questionnaire was presented in the form of table that give out details for the answer given by the respondents on the questionnaire regarding the idea of FINE.NANCE application. The contain of the table can be seen in **TABLE 1** and **TABLE 2**.

TABLE 1. Result of Questionnaire

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Nama Anda	Kelas	Nama Kelomp	Saya merasa	Ide bisnis ini	Saya bisa me	Dalam ide bis	Ide ini menun	Masalah yan	Saya merasa	Deskripsi ma	Ide ini secara	Proposisi bis	Ide-ide yang	Ide bisnis ini	Pendekatan i	Saya merasa	Dalam fase p	Prototipe atau	Saya merasa
2	LA1	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
3	LA2	LA10	FINE.NANCE	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	LA3	LA10	FINE.NANCE	4	4	5	4	4	5	4	5	3	4	4	4	3	4	4	4	4
5	LA4	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5
6	LA5	LA10	FINE.NANCE	5	4	4	4	5	4	5	4	5	5	5	4	5	5	4	5	5
7	LA6	LA10	FINE.NANCE	4	5	4	4	4	4	3	5	4	4	4	4	5	5	4	5	5
8	LA7	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
9	LA8	LA10	FINE.NANCE	4	4	4	4	4	5	4	4	4	5	4	4	4	4	5	4	4
10	LA9	LA10	FINE.NANCE	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
11	LA10	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
12	LA11	LA10	FINE.NANCE	4	5	4	4	5	5	5	4	4	5	4	4	4	5	5	5	5
13	LA12	LA10	FINE.NANCE	4	5	3	5	5	4	5	5	4	5	4	4	3	5	4	5	4
14	LA13	LA10	FINE.NANCE	5	5	5	5	5	4	4	4	4	4	2	3	2	4	3	5	4
15	LA14	LA10	FINE.NANCE	5	5	5	4	5	5	4	5	5	5	5	4	5	5	5	5	5
16	LA15	LA10	FINE.NANCE	5	5	4	5	5	5	5	5	5	5	5	5	4	4	5	4	4
17	LA16	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
18	LA17	LA10	FINE.NANCE	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
19	LA18	LA10	FINE.NANCE	5	4	4	4	5	4	5	4	5	5	5	4	5	5	4	5	5
20	LA19	LA10	FINE.NANCE	4	5	4	4	5	5	5	4	4	5	4	4	4	5	5	5	5
21	LA20	LA10	FINE.NANCE	4	5	3	5	5	4	5	5	4	5	4	4	3	5	4	5	4
22	LA21	LA10	FINE.NANCE	5	5	5	5	5	4	4	4	4	4	2	3	2	4	3	5	4
23	LA22	LA10	FINE.NANCE	5	5	5	4	5	5	4	5	5	5	5	4	5	5	5	5	5
24	LA23	LA10	FINE.NANCE	5	5	4	5	5	5	5	5	5	5	5	4	4	5	4	4	4
25	LA24	LA10	FINE.NANCE	4	5	4	4	4	4	3	5	4	4	4	4	5	5	4	5	5
26	LA25	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
27	LA26	LA10	FINE.NANCE	4	4	4	4	4	5	4	4	4	5	4	4	4	4	5	4	4
28	LA27	LA10	FINE.NANCE	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
29	LA28	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
30	LA29	LA10	FINE.NANCE	4	5	4	4	5	5	5	4	4	5	4	4	4	5	5	5	5
31	LA30	LA10	FINE.NANCE	4	4	5	4	4	5	4	5	3	4	4	4	3	4	4	4	4
32	LA31	LA10	FINE.NANCE	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5
33	LA32	LA10	FINE.NANCE	5	4	4	4	5	4	5	4	5	5	5	4	5	5	4	5	5

TABLE 2. Result of Questionnaire

	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	Deskripsi ma	Ide ini secara	Proposisi bis	Ide-ide yang	Ide bisnis ini	Pendekatan i	Saya merasa	Dalam fase p	Prototipe atau	Saya merasa	Prototipe atau	Prototipe ide	Saya merasa	Pengujian ter	Saya percay	Proses peng	Saya yakin p	Saya merasa	JIKA ANDA ADALAH SEORAN	
2	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	BERINVESTASI	
4	5	3	4	4	4	4	3	4	4	4	4	4	5	4	4	4	4	4	BERINVESTASI	
5	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
6	4	5	5	5	4	5	5	4	5	5	5	5	5	5	5	4	4	5	BERINVESTASI	
7	5	4	4	4	4	5	5	4	5	5	4	4	5	4	5	4	4	5	BERINVESTASI	
8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
9	4	4	5	4	4	4	4	5	4	4	4	4	5	4	4	4	4	4	BERINVESTASI	
10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	BERINVESTASI	
11	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
12	4	4	5	4	4	4	5	5	5	5	4	5	4	4	4	5	5	5	BERINVESTASI	
13	5	4	5	4	4	3	5	4	5	4	4	5	5	2	4	5	3	4	BERINVESTASI	
14	4	4	4	2	3	2	4	3	5	4	5	5	5	5	5	5	5	5	RAGU UNTUK BERINVESTASI	
15	5	5	5	5	4	5	5	5	5	5	5	5	4	4	5	5	5	5	BERINVESTASI	
16	5	5	5	5	4	4	5	4	4	4	4	4	5	4	5	5	4	4	BERINVESTASI	
17	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	BERINVESTASI	
19	4	5	5	5	4	5	5	4	5	5	5	5	5	5	5	4	4	5	BERINVESTASI	
20	4	4	5	4	4	4	5	5	5	5	4	5	4	4	4	5	5	5	BERINVESTASI	
21	5	4	5	4	4	3	5	4	5	4	4	5	5	2	4	5	3	4	BERINVESTASI	
22	4	4	4	2	3	2	4	3	5	4	5	5	5	5	5	5	5	5	RAGU UNTUK BERINVESTASI	
23	5	5	5	5	4	5	5	5	5	5	5	5	4	4	5	5	5	5	BERINVESTASI	
24	5	5	5	5	4	4	5	4	4	4	4	5	4	5	5	5	4	4	BERINVESTASI	
25	5	4	4	4	4	5	5	4	5	5	4	4	5	4	5	4	5	5	BERINVESTASI	
26	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
27	4	4	5	4	4	4	5	4	5	4	4	4	5	4	4	4	4	5	BERINVESTASI	
28	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	BERINVESTASI	
29	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
30	4	4	5	4	4	4	5	5	5	5	4	5	4	4	4	5	5	5	BERINVESTASI	
31	5	3	4	4	4	3	4	4	4	4	4	5	4	4	4	4	4	4	BERINVESTASI	
32	5	5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	BERINVESTASI	
33	4	5	5	5	4	5	5	4	5	5	5	5	5	5	4	4	5	5	BERINVESTASI	

4. CONCLUSIONS

According to the result of the conducted questionnaire, the majority of the respondents, which consists of up to 32 students of BINUS Malang, gave out positive responds and are willing to invest to the development of the idea if the idea ever got realized into an actual business. This response, further prove that the idea of FINE.NANCE application as a new innovative solution to solve the problem with financial management and also as a business are approved by the community, allowing for further development and improvement on the idea.

The result of this study highlight the potential of the FINE.NANCE application as an innovative solution to address the challenges of financial management in the modern era. The application of the Design Thinking Methodology proved essential in identifying user needs, generating creative solutions, and iteratively refining features to align with user

expectations. The inclusion of AI-driven functionalities, such as wish-to-buy, spending limits, and financial statement generation and analysis, put FINE.NANCE as a tool capable of promoting financial literacy and responsible financial behavior.

Moreover, user feedback collected through surveys and testing reinforced the relevance and practicality of the proposed features, suggesting a strong demand for such solutions in the current market. The research underscores the importance of user-centered design in fin-tech innovation, demonstrating how empathy and iterative development can lead to more effective and widely accepted products.

However, the study also identifies areas for improvement, such as enhancing the accuracy of AI predictions and ensuring seamless integration of traditional e-wallet functionalities with advanced features. Future research and development should focus on scalability, security, and user engagement strategies to strengthen FINE.NANCE's position in the competitive fintech landscape. Overall, this study reaffirms the critical role of combining technological innovation with human-centric design to create impactful and sustainable financial solutions.

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