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## DESIGN THINKING PROJECT

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**COURSE NAME** : SECP1513 TECHNOLOGY & INFORMATION SYSTEM  
**SECTION** : 01  
**PROJECT TITLE** : INTELLIGENT PERSONAL FINANCE MANAGER  
**LECTURER'S NAME** : DR NOOR HIDAYAH ZAKARIA  
**GROUP MEMBERS** : GROUP 3

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## **Table of Contents**

<b>1.0 Introduction</b>	<b>1</b>
<b>2.0 Detail Steps and Description in Design Thinking Phases</b>	<b>2</b>
<b>3.0 Detailed Descriptions (Problem, Solution, Team Working</b>	<b>8</b>
3.1 Problem	8
3.2 Solution	9
3.3 Team Working	10
<b>4.0 Design Thinking Assessment Points</b>	<b>11</b>
<b>5.0 Design Thinking Evidence</b>	<b>13</b>
5.1 Empathize Phase	13
5.1.1 Interview	13
5.1.2 Questionnaires for Google Survey Form	15
5.2 Define Phase	18
5.3 Ideate Phase	21
5.4 Prototype Phase	22
5.4.1 Interface Sketches with Wireframes	22
5.4.2 Low-Fidelity Prototype Design Using Adobe XD In-Progress	24
5.4.3 Completed Low-Fidelity Prototype App	25
5.5 Testing Phase	28
<b>6.0 Reflections</b>	<b>29</b>
<b>7.0 Task Distributions</b>	<b>32</b>

## **1.0 Introduction**

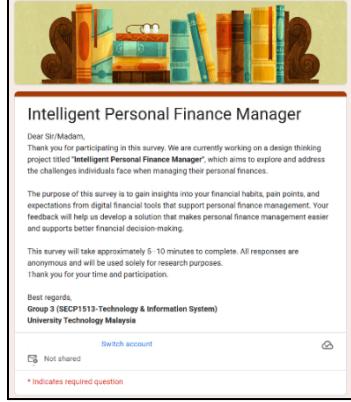
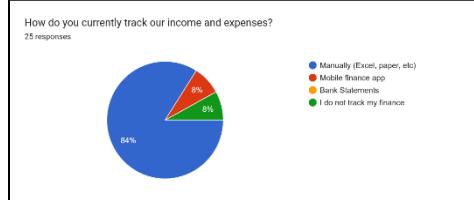
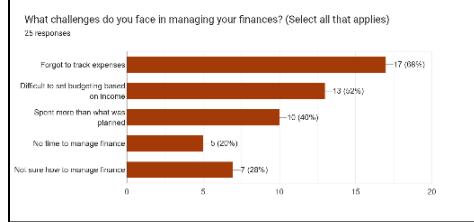
We are required to work on a group project using Design Thinking methodologies for our SECP1513-Technology and Information System course. Design Thinking is a human-centric methodology for problem-solving that emphasizes understanding user needs and focusing on practical solutions rather than just the problem itself. It consists of five key phases: Empathize, Define, Ideate, Prototype, and Testing.

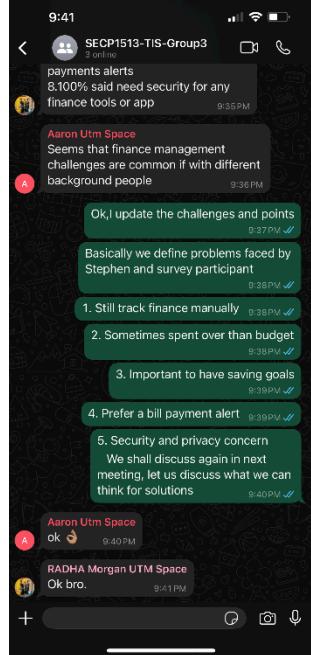
The project must be based on the given theme: “Big Data and Artificial Intelligence New Innovation.” Following this requirement, our group chose to explore issues related to personal finance, as these issues have become more serious with rising inflation and the cost of living. This challenge is closely related to the theme because we want to discover how technology can help people manage their finances better in today’s economy. By using design thinking methodologies, we hope to explore user challenges in personal finance management and then develop a AI-driven solutions to help them managing their finances more efficiently.

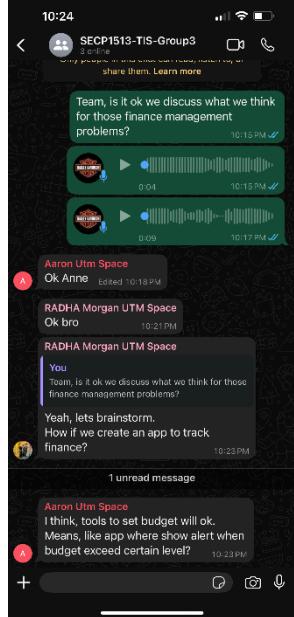
## 2.0 Detail Steps and Descriptions in Design Thinking Phases

This section described detail steps of each phase Design Thinking process that that we did in our project. Each stage of the process was followed to explore and address user challenges in personal finance management. The table below provides a summary of the purpose of each phase, the actions done by our team, and the supporting evidence collected throughout the project.

Phase	Description	Actions, Evidence and Results
Empathize	<ul style="list-style-type: none"><li>• Understand user needs by observing their behaviours without making assumptions.</li><li>• This can be done by conducting interview or conduct survey to better understand their problems and pain points.</li><li>• Immerse with user situation also will helps to experience thing from user point of view.</li></ul>	<ul style="list-style-type: none"><li>• Conducted an interview with Mr. Stephen, a young professional, via Google Meet to understand his personal finance management. He was chosen because young working professionals in their early careers often face key financial challenges like budgeting and saving.</li><li>• <b>Evidence:</b> Interview session. </li><li>• Distributed a Google Form survey to various backgrounds of people regarding their finance management habits.</li></ul>

		<ul style="list-style-type: none"> <li>● <b>Evidence:</b> Google Form Survey.</li> </ul>  <p><b>Intelligent Personal Finance Manager</b></p> <p>Dear Sir/Madam, Thank you for participating in this survey. We are currently working on a design thinking project titled "Intelligent Personal Finance Manager", which aims to explore and address the challenges individuals face when managing their personal finances.</p> <p>The purpose of this survey is to gain insights into your financial habits, pain points, and expectations from digital financial tools that support personal finance management. Your feedback will help us develop a solution that makes personal finance management easier and supports better financial decision-making.</p> <p>This survey will take approximately 5-10 minutes to complete. All responses are anonymous and will be used solely for research purposes. Thank you for your time and participation.</p> <p>Best regards, Group 3 (SEC1513-Technology &amp; Information System) University Technology Malaysia</p> <p><a href="#">Switch account</a></p> <p> Not shared</p> <p>* indicates required question</p>																												
		<ul style="list-style-type: none"> <li>● <b>Result:</b> Gathered insights regarding their habits and challenges in managing personal finances.</li> </ul>																												
<b>Define</b>	<ul style="list-style-type: none"> <li>● Reframe the challenge into a clear, user-centred problem based on findings from Empathize.</li> </ul>	<ul style="list-style-type: none"> <li>● Identified key pain points: manual expense tracking, overspending, unclear financial goals, and lack of reminders.</li> <li>● <b>Evidence:</b> Survey responses analysis.</li> </ul>  <table border="1"> <thead> <tr> <th>Method</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Manually (Excel, paper, etc.)</td> <td>64%</td> </tr> <tr> <td>Mobile finance app</td> <td>8%</td> </tr> <tr> <td>Bank Statements</td> <td>9%</td> </tr> <tr> <td>I do not track my finance</td> <td>9%</td> </tr> </tbody> </table>  <table border="1"> <thead> <tr> <th>Challenge</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Forgot to track expenses</td> <td>17</td> <td>(68%)</td> </tr> <tr> <td>Difficult to set budgeting based on income</td> <td>13</td> <td>(52%)</td> </tr> <tr> <td>Spent more than what was planned</td> <td>10</td> <td>(40%)</td> </tr> <tr> <td>No time to manage finance</td> <td>5</td> <td>(20%)</td> </tr> <tr> <td>Not sure how to manage finance</td> <td>7</td> <td>(28%)</td> </tr> </tbody> </table>	Method	Percentage	Manually (Excel, paper, etc.)	64%	Mobile finance app	8%	Bank Statements	9%	I do not track my finance	9%	Challenge	Count	Percentage	Forgot to track expenses	17	(68%)	Difficult to set budgeting based on income	13	(52%)	Spent more than what was planned	10	(40%)	No time to manage finance	5	(20%)	Not sure how to manage finance	7	(28%)
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		<ul style="list-style-type: none"> <li>● <b>Evidence:</b> Discussion to reframe challenges.</li> </ul> 
<b>Ideate</b>	<ul style="list-style-type: none"> <li>● Generate and refine ideas for possible solutions based on the problem statement defined earlier.</li> <li>● Team members are encouraged to think openly and brainstorm together to explore different ways or approaches to solve the user's problem.</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Reframed challenges:</b> Users need a simple way to manage their personal finances with guidance.</li> </ul>

		<ul style="list-style-type: none"> <li>● <b>Evidence:</b> Brain-storm process among team members for solutions.</li> </ul> 
Prototype	<ul style="list-style-type: none"> <li>● Develop a visual and interactive model to represent selected solution.</li> </ul>	<ul style="list-style-type: none"> <li>● Selected key features such as expenses tracking, budget setting, saving goals, spending summaries, bill payment alerts, and an AI chatbot.</li> <li>● <b>Result:</b> Combined into a single concept - <b>Intelligent Personal Finance Manager</b> mobile app.</li> </ul>

	<ul style="list-style-type: none"> <li>Prototyping is to turn the idea into a testable form that can be improved based on user feedback.</li> </ul>	<ul style="list-style-type: none"> <li><b>Evidence:</b> Sketches for app wireframes.</li> </ul> <ul style="list-style-type: none"> <li>Design low-fidelity prototype using Adobe XD.</li> <li><b>Evidence:</b> Low-fidelity designing in-progress.</li> </ul> <ul style="list-style-type: none"> <li><b>Result:</b> Low fidelity prototype with budget setting, expenses tracking, saving goals, bill payment alerts, AI assistant, and biometric security.</li> </ul>
<b>Testing</b>	<ul style="list-style-type: none"> <li>Evaluate prototype by gathering real user feedback to improve the solution.</li> </ul>	<ul style="list-style-type: none"> <li>Tested prototype with Mr. Stephen and friends.</li> </ul>

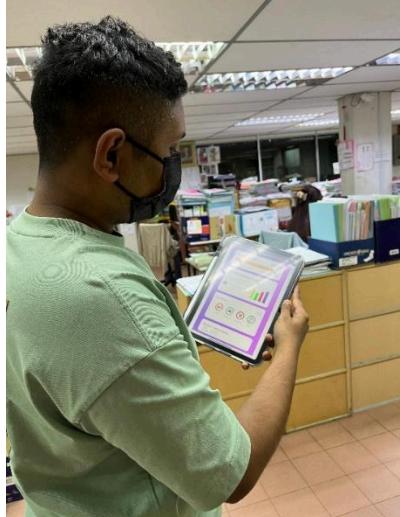
		<ul style="list-style-type: none"> <li>● <b>Evidence:</b> Mr. Stephen is testing the prototype.</li> </ul>  <ul style="list-style-type: none"> <li>● <b>Result:</b> Feedback was positive overall with some feedbacks to make the prototype with more intuitive navigation and tooltips for first-time users.</li> </ul>
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Table 1: Detail Steps and Descriptions in Design Thinking Phases with Evidences

## **3.0 Detailed Descriptions (Problem, Solution, Team Working)**

### **3.1 Problem**

In the current economic situation, rising inflation rates have made people more cautious about their spending. Many individuals are trying to adjust their financial habits, but they still face significant challenges managing their personal finances. Based on our empathize research which includes interview and survey, we identified common finance management problems faced by users across different backgrounds. The most significant problems include:

- **Manual Expense Tracking:** Users need efficient method to track their expenses because many of them still rely on manual methods like notebooks or spreadsheets, which are time-consuming and lack real-time tracking.
- **Overspending:** Users struggle to stay within their planned budgets due to inconsistent tracking or unexpected expenses.
- **Lack of Tools for Saving Goals:** Users wish to set saving goals but do not have tools to monitor progress effectively.
- **Bill Payment Management:** Users want some payment alert because it is stressful to managing multiple bill with different due date.
- **Security and Privacy Concerns:** Users emphasized that any finance tool must have strong data protection, such as password and biometric authentication.

Based on these findings, it shows that user needs a simple way to manage their personal finances such as track their expenses efficiently, setting their budget together with saving goal, bill payment reminder and securing their financial information with strong security measures.

## 3.2 Solution

To address the challenges identified in our research, our team worked together to brainstorm potential solutions. We focused on real user needs and habits, aiming to create a tool that is both simple and practical in everyday life. After evaluating various ideas, we combined the most effective ones into a single concept: a mobile application called **Intelligent Personal Finance Manager (FinAI)** with these features:

- **Expense Tracking:** Users can log their expenses in real-time, allowing them to track their spending easily. This eliminates the need for manual tracking and provides instant updates.
- **Budget Management:** Helps users set and track their budgets by allowing them to input their monthly income and set spending limits. It notifies them when they approach their budget limits, ensuring they stay on track with their financial goals.
- **Savings Goal Tracker:** Helps users set, visualize, and track savings goals using progress bars and charts.
- **Bill Payment Alerts:** Users can set recurring bill due dates and receive timely alerts to avoid late payments
- **Security and Privacy:** Includes encryption and secure login with password and biometric authentication to protect user data.

### **3.3 Team Working**

Our team of three members divided tasks based on each Design Thinking phase:

- **Empathize Phase:** Radha led the user research. She prepared and distributed the Google Form survey and organized an interview with Mr. Stephen Marshall via Google Meet. All members participated in the session and asked questions.
- **Define & Ideate Phases:** Arul summarized findings from the empathy phase to define common problems. He led the brainstorming session through WhatsApp and helped refine our app concept based on user needs.
- **Prototype & Test Phases:** Aaron led the development of the prototype. Arul provided wireframes sketches showing user interaction, Aaron used it as guidance to create a low-fidelity version using Adobe XD. During the testing phase, Aaron invited Mr. Stephen to participate in a user testing session. The rest of the team also involved friends to test the prototype and gather feedbacks from them.

We collaborated through WhatsApp for communication and Google Drive for document sharing. Each member led different phases, ensuring balanced involvement throughout the project.

## **4.0 Design Thinking Assessment Points**

Assessment in Design Thinking occurs at the end of each phase and during transitions between phases to ensure the project stays user-centred and solutions really solves the user problems. For our project, **Intelligent Personal Finance Manager**, we conducted assessments throughout the process to keep our solution aligned with user needs.

- **Empathize Phase Assessment:**

We interviewed Mr. Stephen Marshall, a young professional representing working adults, and distributed a survey to various users. The insights revealed common challenges like manual expense tracking, budgeting difficulties, and privacy concerns, confirming our focus on relevant problems.

- **Define Phase Assessment:**

We analysed user data and confirmed shared difficulties such as inconsistent tracking, overspending, and the need for saving goal support. This validated our problem statement as user-centred and actionable.

- **Ideate Phase Assessment:**

During brainstorming, we evaluated ideas for feasibility and alignment with user needs, selecting key features like expense tracking, budget alerts, savings goals, and an AI chatbot, combining them into a single app concept.

- **Prototype Phase Assessment:**

A low-fidelity prototype was developed based on solutions identified by including chosen features. We assessed the prototype to ensure it reflected all key ideas and followed a clear and user-friendly structure.

- **Test Phase Assessment:**

Users including Mr. Stephen and friends tested the app by performing tasks such as add expenses, set budget and add a saving goal. Feedback highlighted satisfaction with features but suggested improvements for the app to be more intuitive and add tool-tips for easy guide for new user.

These timely assessments helped us maintain focus on real user needs and adjust our solution before moving to the next phase, ensuring continuous improvement and relevance throughout the project.

## 5.0 Design Thinking Evidence

### 5.1 Empathize Phase

#### 5.1.1 Interview

Interview questions and answers by Mr Stephen Marshall (26 years old), a young professional are shown in Table 2 while full interview video recording can be access through this link:

[https://drive.google.com/file/d/1tvRukCBtekJzXewJn\\_vLnS1PJPf0tD7\\_/view?usp=sharing](https://drive.google.com/file/d/1tvRukCBtekJzXewJn_vLnS1PJPf0tD7_/view?usp=sharing)

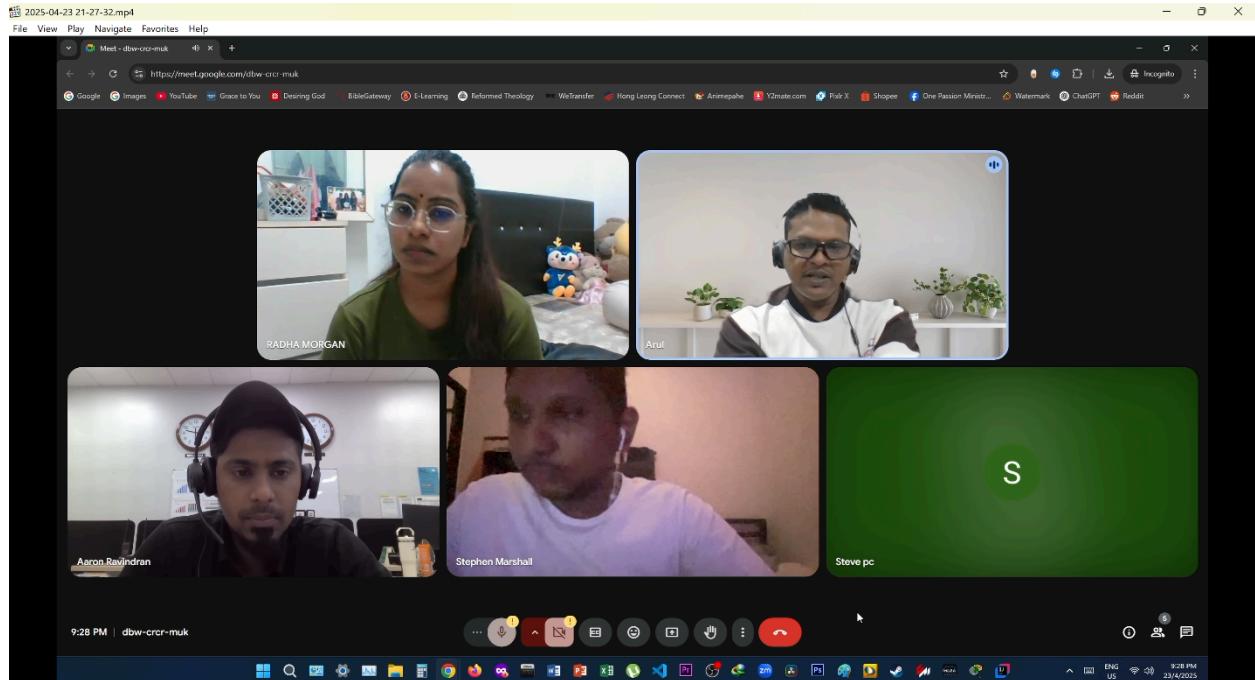


Figure 1: Interview Screenshot with Mr. Stephen Marshall

No	Interview Questions	Interview Answers
1	How do you usually track your spending or savings?	I do not really track my spending or savings but sometimes writes on paper.
2	Do you set budgets? If yes, how often do you follow them?	I do set budget and followed them but sometimes I do spend over the budget.
3	How do you feel about your current way of managing money?	I do not feel any wrong but it is good to have some tools or app for managing my money.
4	If you had a personal finance assistant that's smart and helpful, what would you want it to do?	Yes, I would like to have some financial assistant that able to help me on my daily spending, life savings or monthly expenditure tracking.
5	How important is privacy and security when it comes to finance apps?	For me, privacy and security are important and biometric and password protected access is a must to have.

Table 2: Interview Questions and Answer with Mr. Stephen Marshall

### 5.1.2 Questionnaires for Google Survey Form

We also distributed a Google Survey with a wider group to help us understand common financial habits and challenges across different age groups.



## Intelligent Personal Finance Manager

Dear Sir/Madam,

Thank you for participating in this survey. We are currently working on a design thinking project titled "**Intelligent Personal Finance Manager**", which aims to explore and address the challenges individuals face when managing their personal finances.

The purpose of this survey is to gain insights into your financial habits, pain points, and expectations from digital financial tools that support personal finance management. Your feedback will help us develop a solution that makes personal finance management easier and supports better financial decision-making.

This survey will take approximately 5–10 minutes to complete. All responses are anonymous and will be used solely for research purposes.

Thank you for your time and participation.

Best regards,  
**Group 3 (SECP1513-Technology & Information System)**  
**University Technology Malaysia**

[Switch account](#) 

 Not shared

\* Indicates required question

Figure 2 : Screen Short 1 for Survey Questionnaire Description

What is your current employment status? \*

- Student
- Employed
- Employed and Studying Part-time
- Unemployed
- Retired

How do you currently track our income and expenses? \*

- Manually (Excel, paper, etc)
- Mobile finance app
- Bank Statements
- I do not track my finance

What challenges do you face in managing your finances? (Select all that applies) \*

- Forgot to track expenses
- Difficult to set budgeting based on income
- Spent more than what was planned
- No time to manage finance
- Not sure how to manage finance

Figure 3: Screen Shots 2 for Questionnaire Questions

What features would make you use finance app regularly? (Selects all that applies) \*

- Track expenses
- Budget alerts
- Bill payments alerts
- Set saving goals
- AI Chat

How important is privacy and security when it comes to finance apps? \*

- Not important
- Good to have but not compulsory
- Neutral
- Very Important

Thank you for your participant!

[Back](#)

[Submit](#)

[Clear form](#)

Figure 4: Screen Shots 3 for Questionnaire Questions

## 5.2 Define Phase

Based on interview and survey responses, we defined that user needs a simple way to manage their personal finances such as track their expenses efficiently, setting their budget together with saving goal, bill payment reminder and securing their financial information with strong security measures.

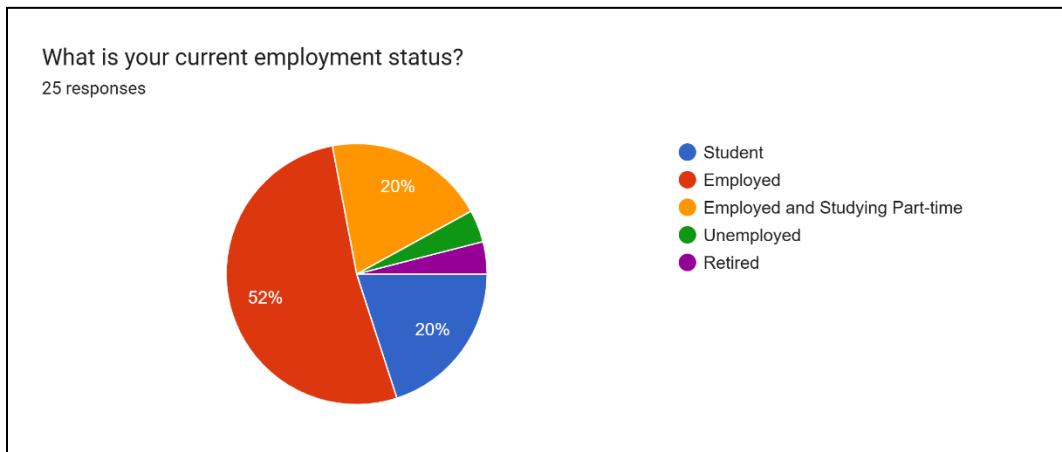


Figure 5: Survey Response for Current Employment Status

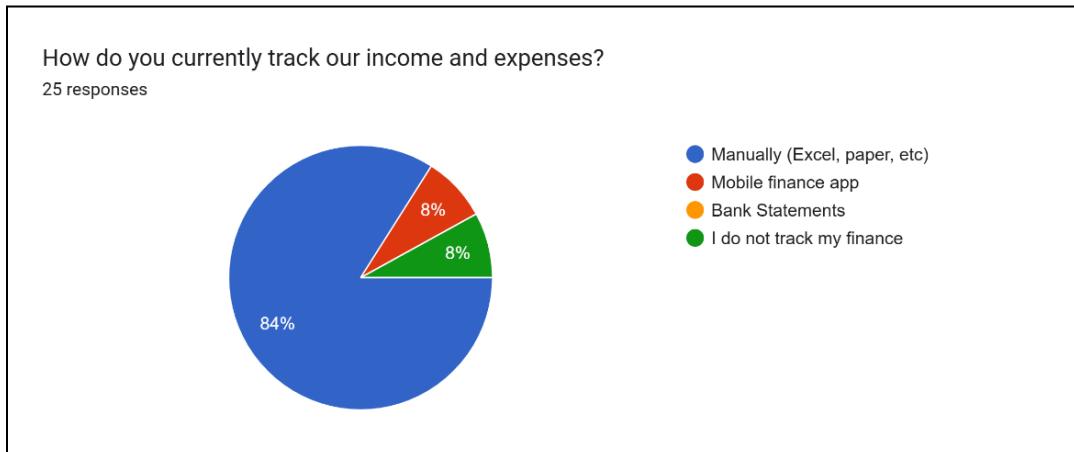


Figure 6: Survey Response for Track Income and Expenses

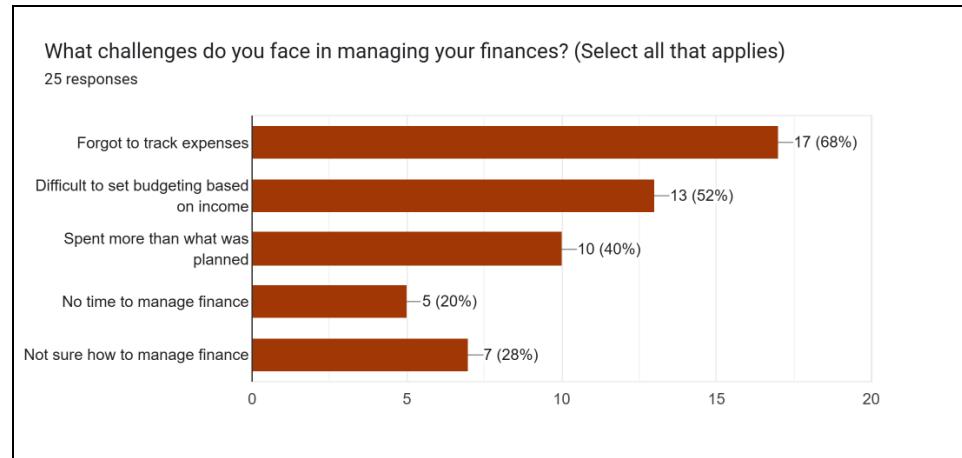


Figure 7: Survey Response for Challenges in Managing Finance

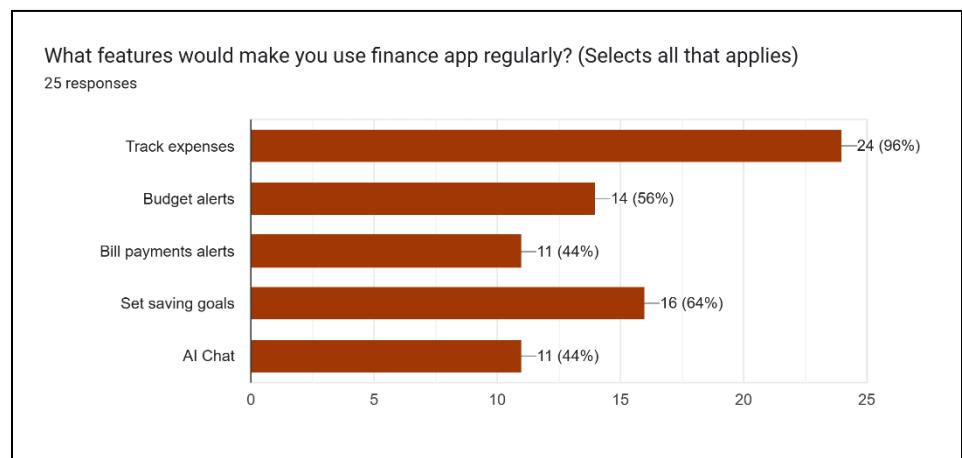


Figure 8: Survey Response for Features that Promotes Users Use Finance App Regularly

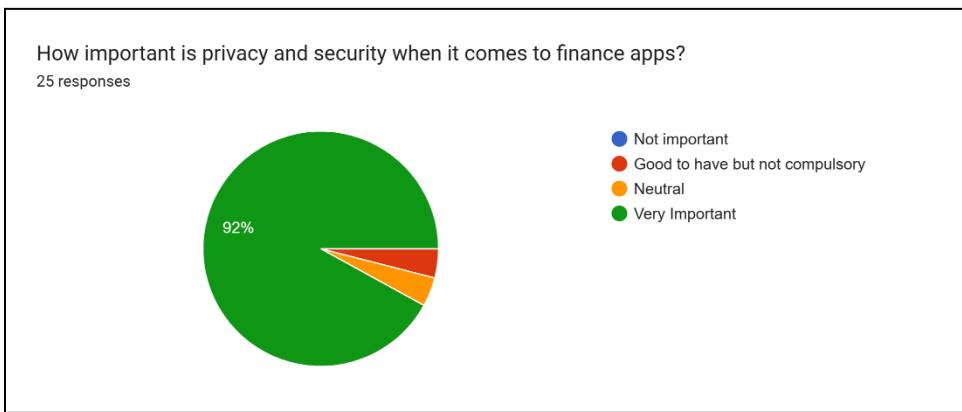


Figure 9: Survey Response for Importance of Privacy and Security in Finance App

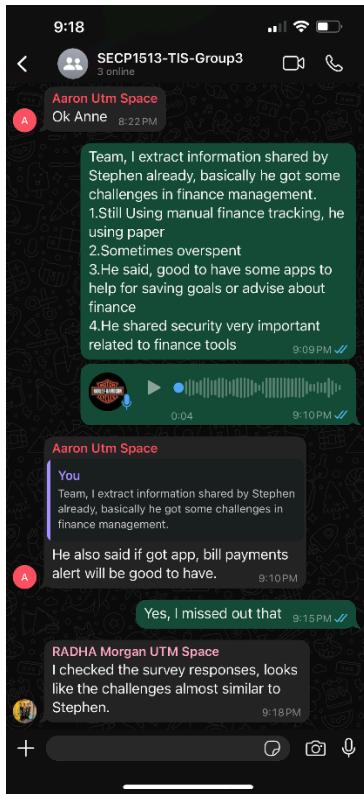


Figure 10

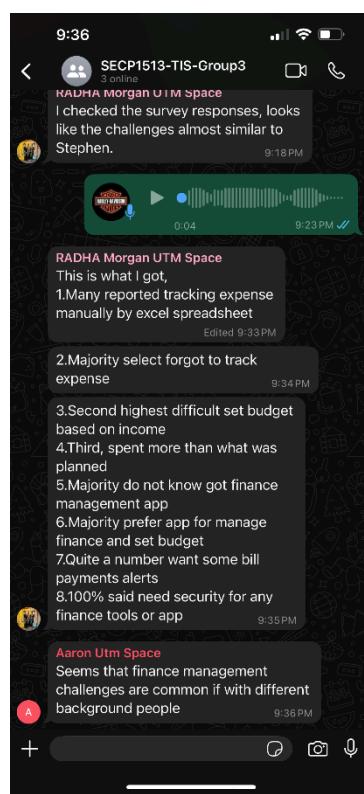


Figure 11

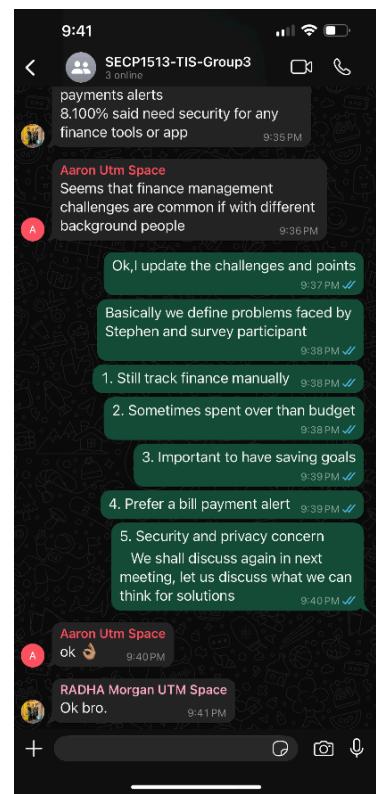


Figure 12

Figure 10,11, and 12: Screenshots of Discussion for Reframe Users Challenges in Define Phase

## 5.3 Ideate Phase

In this phase, we discussed and explored various solutions to the problems identified. After brainstorming different ideas, we decided to combine all those idea features we came with to one mobile app, Intelligent Personal Finance Manager to help users manage their personal finances more effectively.

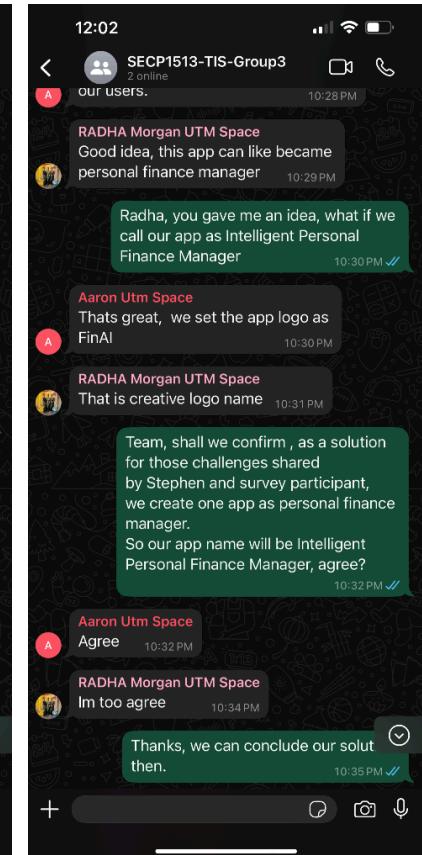
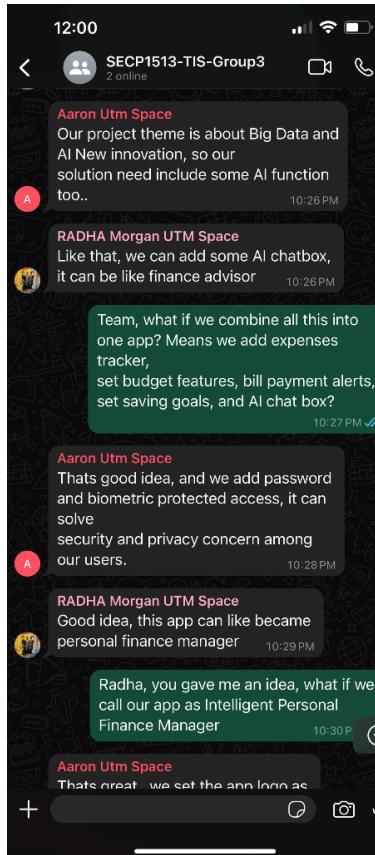
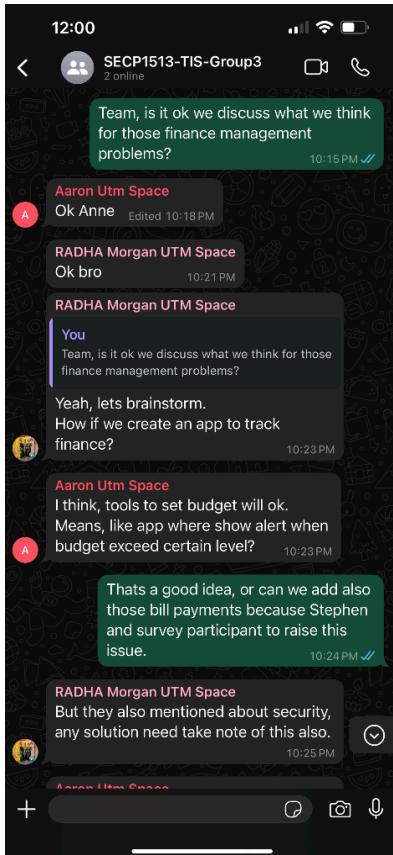


Figure 13

Figure 14

Figure 15

Figure 13, 14, and 15: Screenshots of Brainstorming process for Exploring Various Solutions for Users Problems.

## 5.4 Prototype Phase

We began prototyping based on the solutions we defined, starting with sketches for each feature, followed by wireframes to map user interactions. Using Adobe XD, we created a low-fidelity prototype to visualize user engagement and set the stage for user testing.

### 5.4.1 Interface Sketches with Wireframes

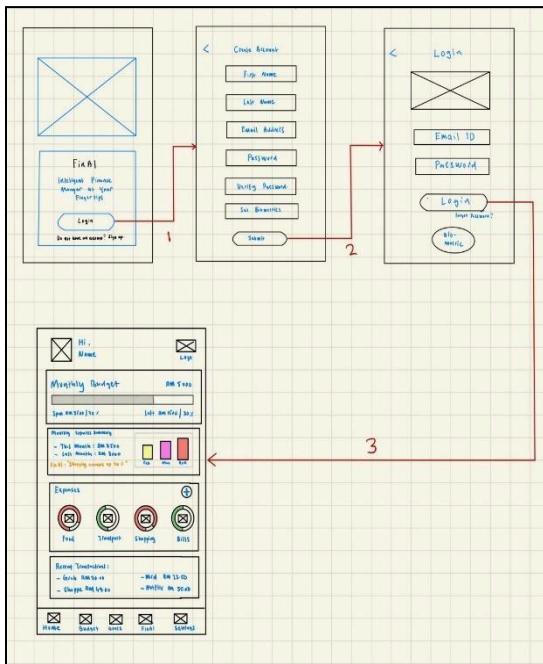


Figure 16: Wire Frame for Login to App

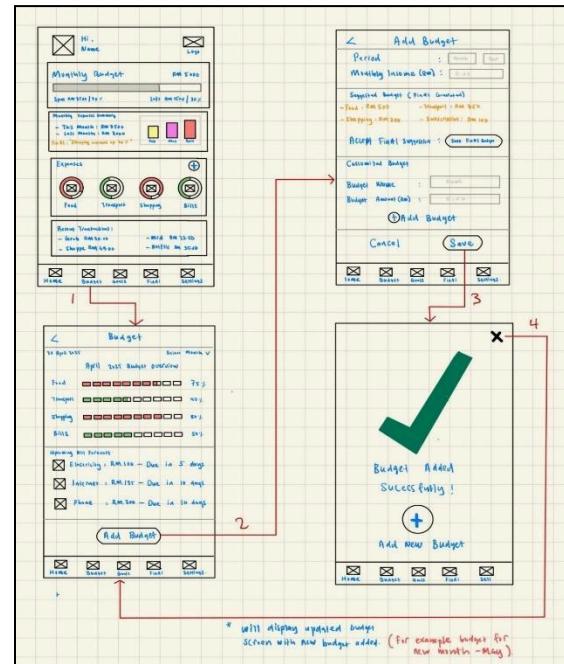


Figure 17: Wire Frame for Add Budget

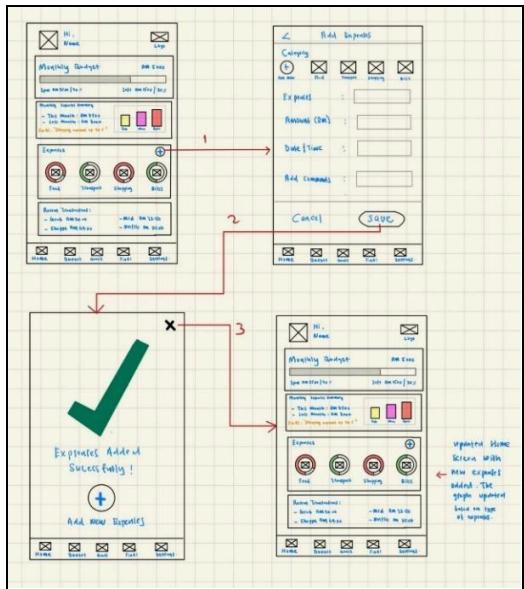


Figure 18: Wire Frame for Add Expense

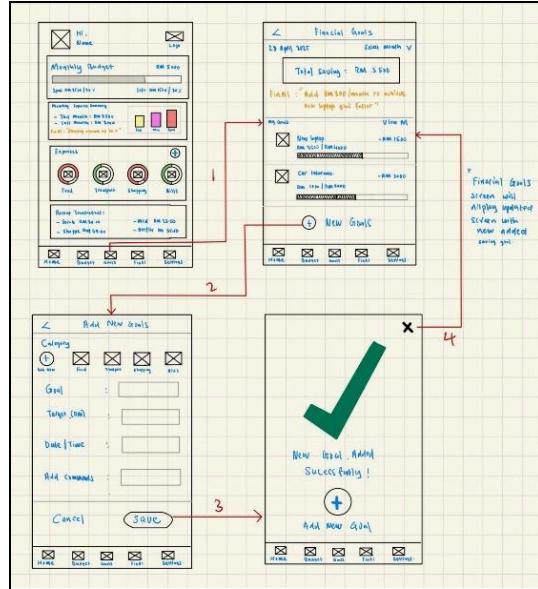


Figure 19: Wireframe for Add Saving Goals

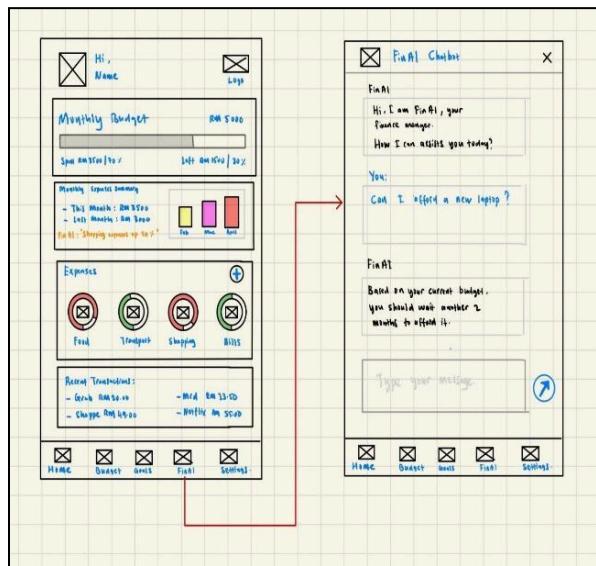


Figure 20: Wire Frame for AI Chat Box

## 5.4.2 Low-Fidelity Prototype Design Using Adobe XD In-Progress

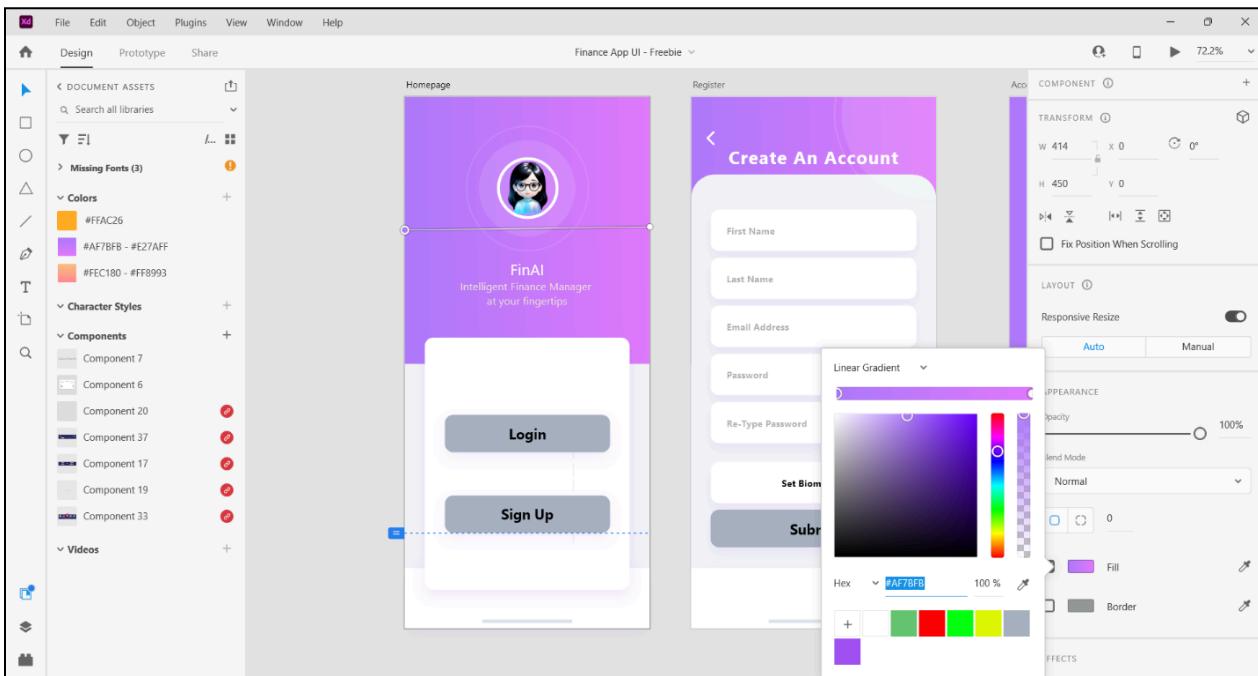


Figure 21: Low-Fidelity Prototype Design In-Progress (1)

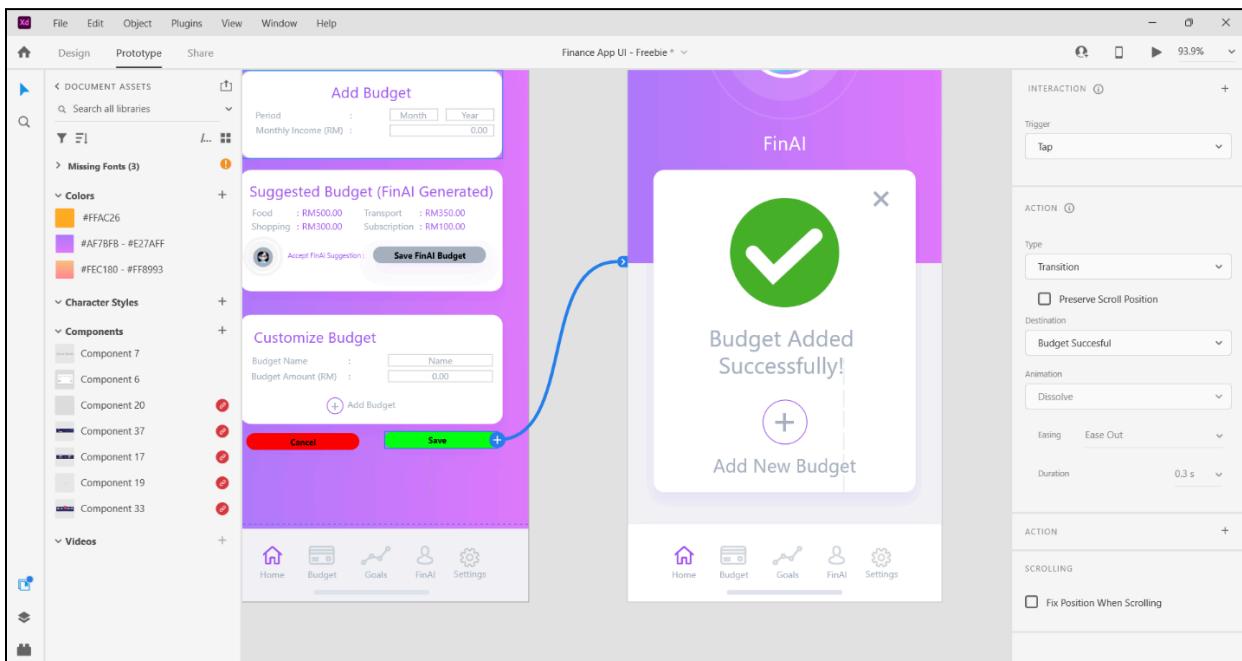


Figure 22: Low-Fidelity Prototype Design In-Progress (2)

### 5.4.3 Completed Low-Fidelity Prototype App

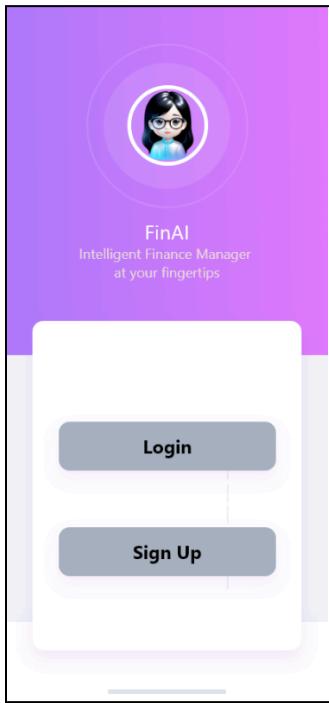


Figure 23: Prototype Landing Page

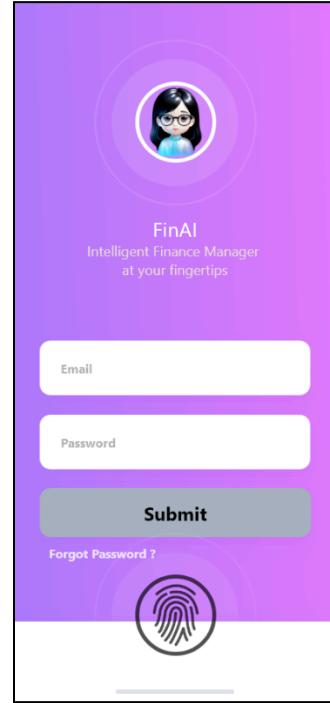


Figure 24: Prototype Login Page

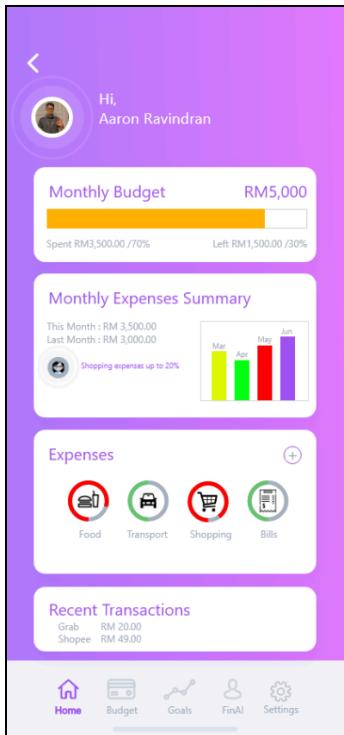


Figure 25: Prototype Main Page

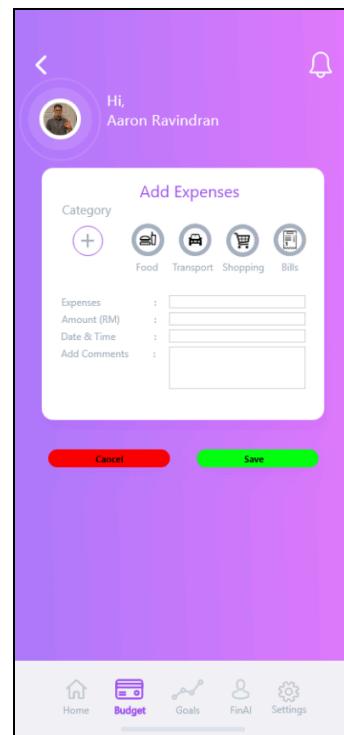


Figure 26: Prototype Add Expenses Page

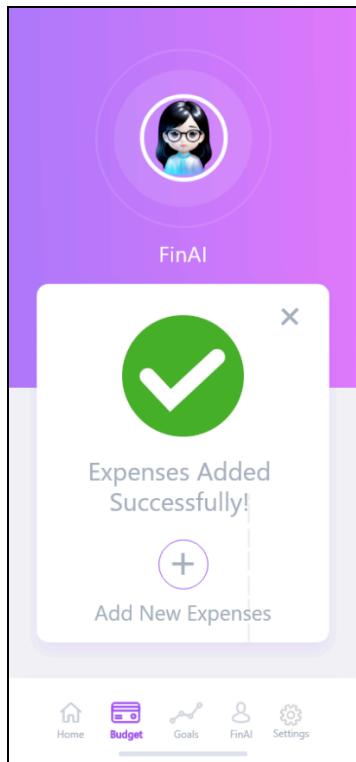


Figure 27: Expenses Successfully Added

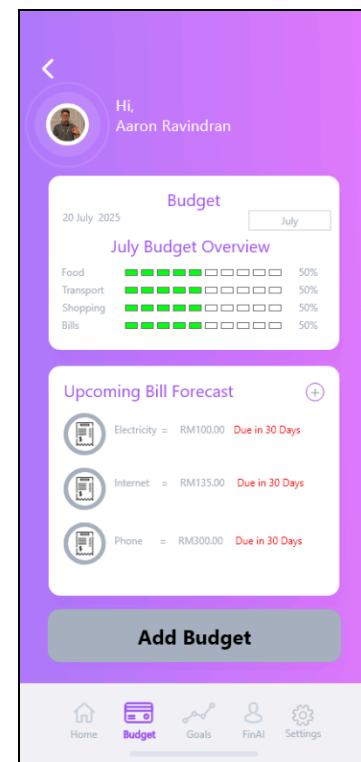


Figure 28: Prototype Budget Page

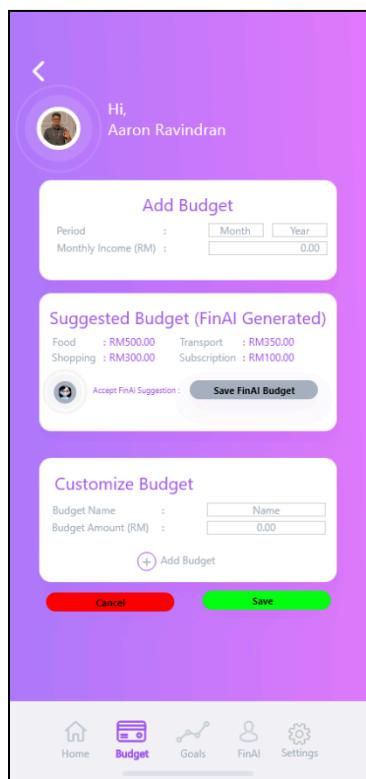


Figure 29: Prototype Add Budget

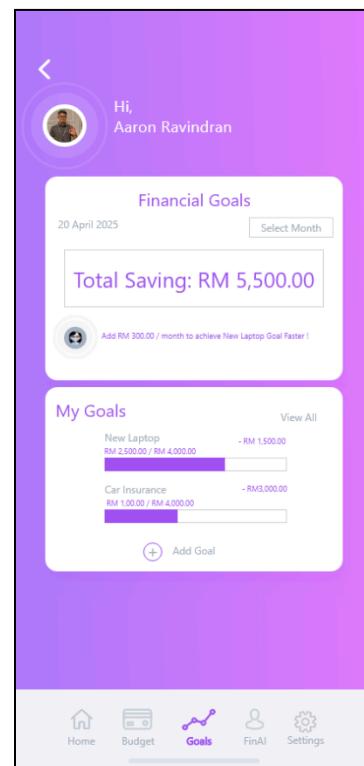


Figure 30: Prototype Financial Goal Page

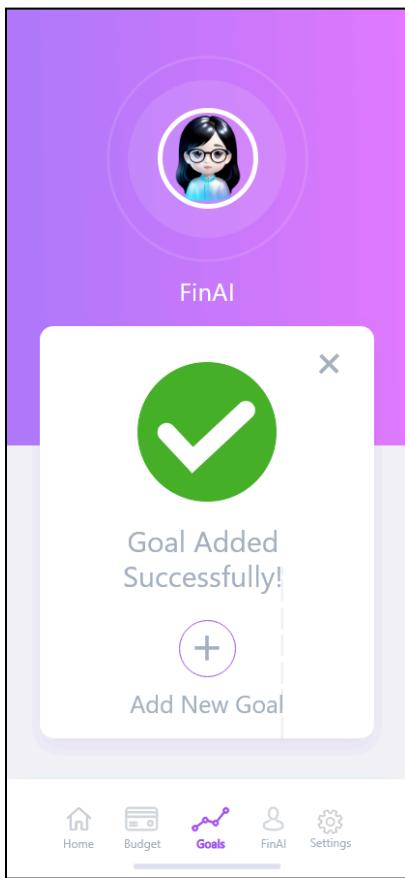


Figure 31: Budget Added Successfully

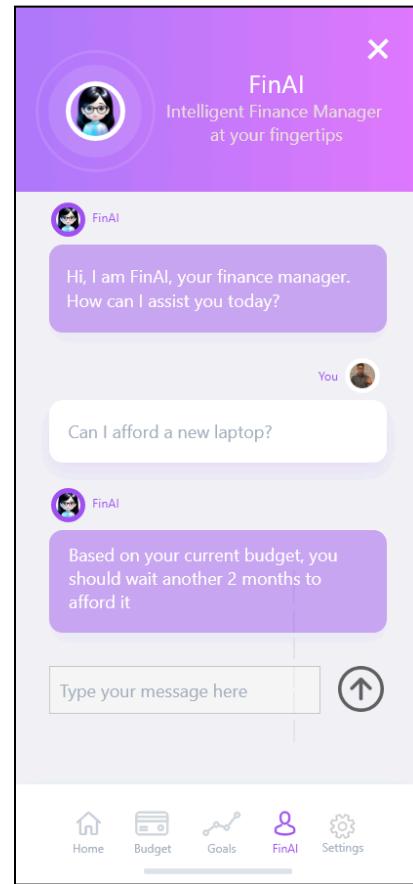


Figure 32: Prototype AI Chat Box

## 5.5 Testing Phase

After completing the prototype, we invited Mr. Stephen and friends to test the app. They were mostly satisfied, but feedback suggested the interface could be more intuitive, and adding tooltips would help new users. These insights will guide for future improvements.

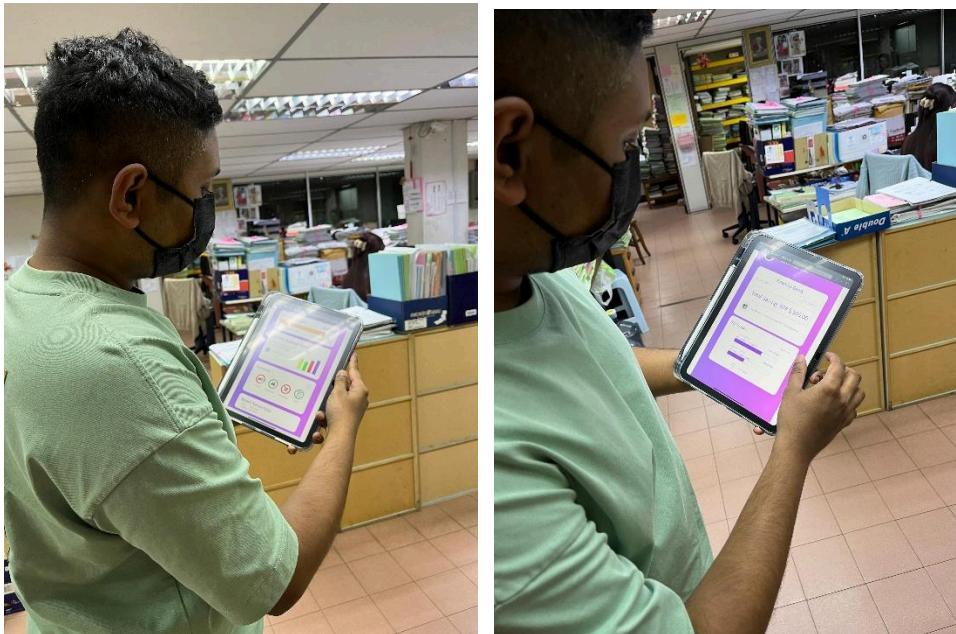


Figure 33: Shows User (Mr. Stephen) is Testing the Prototype

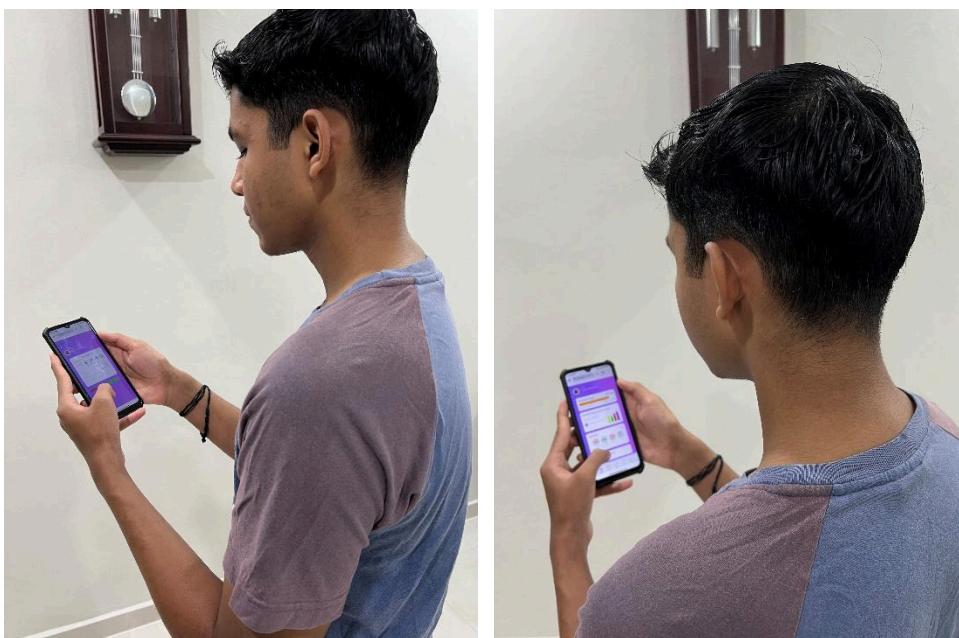


Figure 34: User (Friend) is Testing the Prototype

## **6.0 Reflections**

1. Arulmurugan a/l Subramaniyam (SX210291ECJHS01)

### **What is your goal/dream with regard to your course/program?**

My goal in the Computer Science (Software Engineering) program is to strengthen my skills in programming languages, while staying updated with technologies such as AI, mobile apps, and real-time systems. Since I already work in the industry, I am not looking to change careers but hope to grow professionally and prepare for future roles in consulting or starting a tech business.

### **How does this design thinking impact on your goal/dream with regard your program?**

The design thinking experience helped me to understand that solving real problems begins with understanding what people truly need. This user-centred approach is valuable for my future consultancy or service-based work plan, where solving real-world problems effectively is key to success.

### **What is the action/improvement/plan necessary for you to improve your potential in the industry?**

I plan to work on hands-on projects, improve teamwork skills, and build a strong portfolio that shows my technical skills. Staying updated with new technology will help me stay relevant and succeed as the industry grows and changes.

2. Aaron Ravindran (SX210292ECJHS01)

**What is your goal/dream with regard to your course/program?**

My goal in this course is to become a capable IT professional who can solve real-world problems through innovative system design and digital solutions. I want to work in a tech-forward company, contributing to areas like cloud systems, cybersecurity, or automation.

**How does this design thinking impact on your goal/dream with regard your program?**

Design thinking plays a key role by teaching me to approach problems with empathy and creativity. It helps me focus on user-centred solutions and adapt quickly through feedback.

**What is the action/improvement/plan necessary for you to improve your potential in the industry?**

To improve my potential, I plan to engage in hands-on projects, seek internships, stay updated with IT trends, and improve soft skills like communication and teamwork. I also aim to participate in tech events to boost my confidence and practical experience.

3. Radha Morgan (SX2203359ECRHS01)

**What is your goal/dream with regard to your course/program?**

My goal regards my course is to complete the course successfully with the knowledge and experience to apply in real world after the studies completed. I hope can learn and upgrade my learning in this course for better understanding for future job goals.

**How does this design thinking impact on your goal/dream with regard your program?**

Design thinking impact on my goal with regard to my program is it teach and encourage me to build confidence in myself to step forward to look for a problem in real life from human perspective and thinking that need for a better solution for a better life.

**What is the action/improvement/plan necessary for you to improve your potential in the industry?**

My plan is to upgrade or improve my soft skills, upgrade my technical skills, more Participation and involvement in the extra activities or workshops at workplace and hands on project to apply my classroom skills and knowledge to solve a problem.

## 7.0 Task Distributions

No	Members Name	Tasks
1	Arulmurugan.S	<p><b>Lead: Define and Ideate phase</b></p> <ul style="list-style-type: none"> <li>• Report Writing (Introduction, Detail Steps, Detailed Descriptions-Solutions and Team Working, Assessment points)</li> <li>• Sketches for app interfaces (screens)</li> <li>• Design wire frames for app interactions</li> <li>• Prototype Demonstration</li> <li>• Video editing</li> </ul>
2	Aaron Ravindran	<p><b>Lead: Prototype and Testing phase</b></p> <ul style="list-style-type: none"> <li>• Report Writing (Detailed Descriptions - Problem, Design Thinking Evidence-Define, Ideate, Prototype and Testing)</li> <li>• Design Low-Fidelity prototype using Adobe XD</li> <li>• Presentation points preparation.</li> </ul>
3	Radha Morgan	<p><b>Lead: Empathize phase</b></p> <ul style="list-style-type: none"> <li>• Report Writing (Design Thinking Evidence-Empathize, Q&amp;A, Survey Responses)</li> <li>• Presentation points preparation.</li> </ul>

Table 3: Task Distribution Among Group 3 Members