

PERSONAL EXPENSES MANAGEMENT SYSTEM

By

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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

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SUBMISSION OF FINAL YEAR PROJECT /DISSERTATION/THESIS

It is hereby certified that Tan Min Yee (ID No: 21ACB02549) has completed this final year project entitled “PERSONAL EXPENSES MANAGEMENT SYSTEM” under the supervision of Ts Dr Ku Chin Soon (Supervisor) from the Department of Computer Science, Faculty of Information and Communication Technology.

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ABSTRACT

This is a development-based project. The project is going to develop a personal expenses management system. The personal expenses management system is helping the user to manage their transactions in anywhere at any time. The planning of the finances is important to the user since it can reduce the financial burden of the user. This system is set up to record the transaction, planning the finance, save the money, set the budget and have an overview of the transaction. The novelty of this system is developing a joint account and budget recommendation. The joint account will send the invitation through the user's email address to the invited user to join the joint account and manage the account together. The budget recommendation will be suggested by the system using the data from the Belanjawanku, Employees' Provident Fund. Hence, this system can help the users to manage their expenses and fully utilize it.

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LIST OF ABBREVIATIONS

CEO Chief executive officer

CHAPTER 1

Introduction

1.1 Project Inspiration

This is a personal expenses management system that allows the users to manage their financial statement effectively through an application. There are various types of personal management system's applications in the market that can be downloaded from the google play store and the app store. Before the personal management system was created, people always used the traditional accounting way to record their transactions. The traditional ways are including the sales book, purchase book, cash book, paper and pen and more [1]. These ways need the people to record it manually on paper.

In this project, the personal expenses management system has been studied about the functionality that can be done by the applications and make the enhancement of this system. In the research on the existing system, most of them can record the transaction by categorizing the transaction. Besides, the personal finance management system also allows the user to make a budget or goal, manage the income, investment, spending, convert the foreign currency to their own country currency so that it will be convenient to the user who is traveling to foreign countries. Not only this, but it can also help the user to remember the payments we need to pay every month or year.

Most of the system is only limited to the above function and does not have other special functionality. Therefore, the purpose of this project is to enhance the system to let the user manage their finances in more effective ways. The enhancement of this system is to **develop a joint account to allow multiple individual users to manage one account** especially for the family members and couples. Besides, the enhancement also includes the **recommendation of the budget used**. The user's experience will be increased because of this enhancement in the system since the user can use a single system to experience various functions and it brings a lot of convenience to the user.

The motivation of the personal expenses management system is to develop the joint account function that allow multiple individual users, especially the family members

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and the couples to manage the same account. All the users can contribute to the account such as record the transaction, set the budget for a family or couples and so on. This function can also let the user make some financial decisions together based on their financial status. All the users can view the financial status without asking each other since the system will show it clearly and simply to the user to understand the financial status. Therefore, it can help the user make a better decision on their expenses.

Furthermore, the budget recommendation is important to the user because it can assist the user who is a newbie in using the personal finance management system. The system can make some recommendations to the newbie based on the monthly expenses, desired goal, and established reasonable spending limit and so on. Through the recommendations, the user can also establish healthy financial habits so that they would not have to worry about their financial status.

On the other hand, the reason of develop the personal expenses management system is able to let the user to manage their finance in the effective ways and able to let multiple users to manage the account together. Since, there is not have an application that allows multiple users to manage one account, hence, the joint account function of the personal expenses management system will attract the attention of the users such as a family or couples.

1.2 Problem Statement

There are some problems that can occur in the application of the personal expenses management system. The first problem statement is **that the application of the personal finance management system does not support the joint account function.** The system does not support two individual users to login to the same account to record the transaction or do other functions. This will inconvenience the user if they want to have an account with their family members or couples.

The second problem statement that will happen in the personal expenses management system is **lack of the budget recommendation.** The system will not recommend the user about how to use the budget that was set by the user. Hence, the user may lack the guidance to use the money and does not have the well-planning to manage their finance.

1.3 Project Objectives

There are two objectives of this project. The first objective of this project is **to develop a personal expenses management system that is able to perform a joint account function within multiple individual users.** Therefore, the user can manage an account with their family members or couples together.

The second objective of the project is **to develop a budget recommendation function that is able to give a budget suggestion after answering the questionnaire.** The budget recommendation will be suggested after the user answers the questionnaire for the system.

1.4 Project Scope

The personal expenses system is for all the user that want to record their expenses and income.

The project is developing a mobile application which is about the personal management system. The title of the mobile application is “Budget You”. There are several functions that are provided by this mobile application.

First of all, the function that is provided by the application is it **has a budget recommendation to the users**. The system will ask the user some questions which include the living state of the users, the marital status if the users and the number of children they have or the transportation they used in their life. After receiving the feedback of the user, the system will provide the expenses recommendation to the user. For example, spend how much in different categories or spend how much per day. This can help the user to utilize the funds in an effective way.

Besides, the mobile application of **the personal management system allows the user to record the transaction and categories the transaction**. The user can select the category to record their expenses. This will help the user to record the transaction in more detail. After the user records the transaction, the system will produce a financial report that shows the overview to the user in a pie chart form. The pie chart will display the amount of the expenses based on the categories that are used by the user. The user can select the period they want to know based on the budget set. This can help the user to monitor their expenses clearly.

Furthermore, **the system also provides the set budget function**. The system will let the user set the budget based on their needs. The users need to enter the budget name, decide the date of the budget and allocate the amount of each category based on their needs. This budget set can help the users to track their expenses and show the remaining amount to the users.

In other perspectives, **the application will have a joint account function**. The joint account function is that the application allows the multiple individual users to manage the account together. The joint account function is totally different with the share wallet on the existing system. This is because the joint account function has shared the equal right to manage the account. The user can invite other user to join the account and all

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of the users can do anything with the account same as the individual account. All of the users can set the budget, record the transaction and so on. This function is beneficial to the users who are family or the couples. They can use this function to make a better financial decision with their family members or couples.

In this system, the **XAMPP software is used for accessing the database**. The Apache and MySQL services will be started before start to run the system. The phpMyAdmin is used to create the table in the database and able to let the developers easy to manage the database through the CRUD (Create, Read, Update, Delete) operations.

1.5 Project Impact and Contribution

The contribution of the personal expenses management system is that let the user have the financial awareness. The system can let the user to understand more about their financial statement while make the transaction. This will also be a habit of the user to track their expenses and can control their money to buy something they needed instead the things they want.

Besides, this system can also help the user to improve their saving habits. The user can set a goal or budget on their expenses and save the existing money to the bank account so that they would not spend the money without purpose.

Furthermore, the personal expenses management system also helps the users that have family or couples to manage their expenses. This is because the system able to let the multiple users to join the account. Thus, the family members or couples are easy to manage their transactions. In short, the system is contributed to the family or couples to manage their transactions by multiple users.

1.6 Chapter Summary

In this chapter 1, it is introducing the project that needs to build. It included the project background, overview, motivation and the reason to develop the project. Besides, it also contained the problems statement that found in the existing application and the proposed project objectives of the project. Not only this, but the chapter will also briefly explain the project scope of the project which included the functionality that provided by the system.

CHAPTER 2

Literature Reviews

In order to verify the problem statement stated in Chapter 1, there are 10 existing systems that have been reviewed which include the Money Lover, Spendee, Money Manager, Wallet, Monefy, Fin Art, Cashew, Mony, Fast Budget, Track Wallet

2.1 Money Lover

The first application is Money Lover [2]. Money Lover is a personal expenses management system established by Finsify Technology in 2017. In this application, there are numerous functions that are provided to the users. The main function of this application is that the user can record the expenses based on the category such as food, transportation, utility and so on. The category can be divided into many subcategories so that it can be more detailed to let the user record the expenses. For example, the figure 2.2.1 shows the bills and utilities can be subcategorized to electricity bill, gas bill and so on.

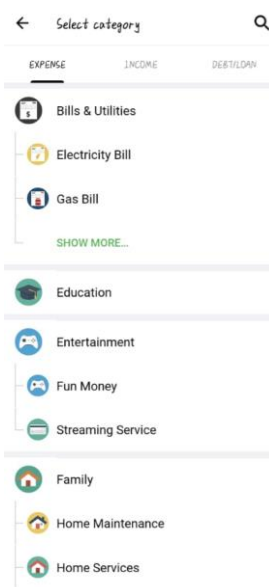


Figure 2.1.1: Main Category and Subcategory of Money Lover [2]

After recording the expenses, the figure 2.1.2 shows that the user can have an overview of the expenses for a week, a month or even a year so that the user can monitor

their expenses and income in the form of a pie chart. Besides, the Money Lover has the function of converting the foreign currency to their own country currencies. This can help the user easily record the expenses when they are travelling in another country. The strength of the Money Lover application is it can connect to the user's bank account. The function will auto record the expenses when the user is paying with their card.



Figure 2.1.2: Overview of transactions

All the functions in the Money Lover application are bring a lot of advantages to the users. However, it **does not have the joint account** which is multiple individual users can manage an account and their have share equal responsibility. This application also **does not have the suggestion of spend money after creating the wallet** with the specific amount of money.

2.2 Spendee

The second application is Spendee [3]. Spendee is a personal expenses management system that founded in year 2016 and the David is the CEO of this application. This system is applicable for the website or the mobile application. The main functionality of this application also the user can **record the expenses and income based on the category**. However, in this application it **does not support the subcategory to the user**. Besides, the figure 2.2.1 show the user can use the same account on the **mobile phone and use the website version on their laptop**. This is because the application is providing **the sync features**. The sync features will update all the things that record by the user at both side of website and the application on the

mobile phone. When the user uses the same gmail to login the account of Spendee, the user is able to login the same account. Hence, the user can record the expenses anytime.

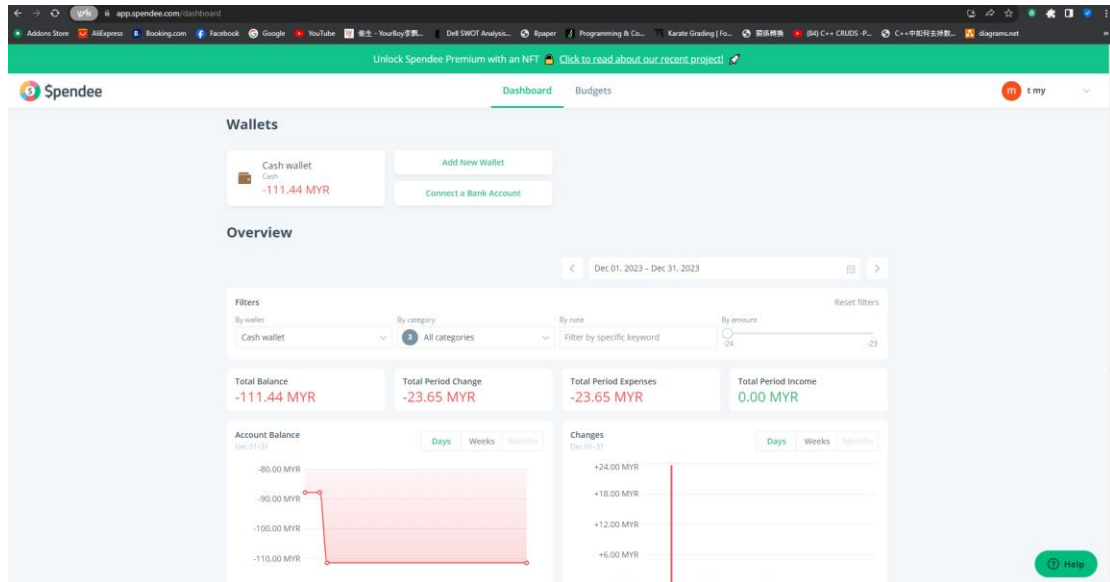


Figure 2.2.1: Webpage of Spendee [3]

Furthermore, the functionality of the Spendee is it **provide the share wallet** to the users. The users which is the owner can invite the other users which is members to the share wallet via the link. The owner and the members can add, delete, and edit the transaction but the member cannot add the category in the share wallet. The share wallet will only show the category that create by the owner. In addition, the Spendee also **able the user to schedule a transaction**. In the figure 2.2.2, it shows that the Spendee will notice the user to make the transaction every month. This can make the user would not forget to make some monthly payments. The Spendee also have **a set budget function** so that the user can control their daily expenses.

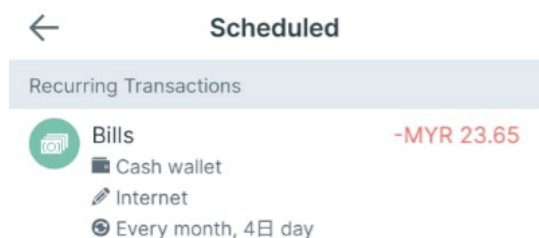


Figure 2.2.2: Schedule Transaction of Spendee

Even the Spendee has the share wallet functionality, but it still **lacks the joint account**. The share wallet and joint account are totally different since the individual users of the joint account, they can use all the functionality that apply in the application. For example, the users can add the category, can set the share budget and so on. However, the share wallet has the limited function, and they are not sharing equal responsibility.

2.3 Money Manager

Next application is Money Manager [4]. Money Manager is a system that contain the personal expenses management system in the application that created in year 2010. The main function of this application is user **able to record the expenses, income and transfer and categories the transaction**. It will **show the well-organized chart** for the user to monitor their expenses or income. The user can also take a photo of the receipt and save them in the transaction when the user records the expenses. The Money Manager also **support the export and import file function**. The user can export the monthly income and expenses data report into the excel file and it can also import the excel file to the application so that it will record the expenses or income automatically to the application.

Moreover, the Money Manager have the **backup functionality**. It will back up all the data in the Money Manager via numerous forms. For example, it can back up the data through the google drive, back up on the mobile device and export backup file to e-mail. Therefore, the users can easily to get the data if the data are missing or the user change the new devices. The Money Manager can **let the user to set a budget**. After setting the budget, it will display a show bar and percentage so that can monitor the current situation of the budget. Nevertheless, the application **does not have the joint account function** and it also **lack the suggestion section of spending money** after the user set the amount of the budget.

2.4 Wallet

In addition, the Wallet application is a personal expenses management system that help the user to manage their finance in one place [5]. This application is founded by Jan Müller, and he organized the company of budget bakers in year 2010. The user can **record the expenses, transfer and income** in the application and **get the balance trend to analysis the expenses of the users**. In this application, it contains a **function call shopping list**. It let the user to create a list and list down all the things that need to buy. When the things were already bought, the user can tick the check box and create a record so that it can be added to the transaction automatically. The user does not need to enter the expenses separately.

Besides, the Wallet application also **supports the set budget function**, the user can set the budget in period of week, month or year. This can help the user fully utilize the funds. The application also has a function to let the user **can set the goal** in the application. When every time the user enters the saved amount, it will auto generate the estimate time to achieve the goal. However, it will **not suggest the amount the user needs to deposit each time**. Hence, it also a limitation of the application. Moreover, the Wallet application **does not provide the joint account functionality** and does not support the multiple individual users to manage an account at the same time.

2.5 Monefy

The following application is Monefy [6]. Monefy is a mobile application that help the user to manage their expenses in anywhere at any time. It was founded in year 2015 and the founder is Dmytri Baglai [7]. This application helps the users to manage their money in an effective way. The user **can categories their expenses for each time** and it will **show the percentage of the expenses** of the day, month, or a year by using the pie chart. The application has a **sync feature** so that the user can login the account with different devices and manage the account with the same data. The Monefy also has an **export file function**. This can let the user to export their expenses to the excel file and doing the analysis on their expenses. The excel file will record the date of the transaction, the category, the amount and so on. Nevertheless, the Monefy application **does not have the set budget functionality**. It only allows the user to set the amount

that can be used in a month instead of setting a budget that used to achieve the goal. Therefore, it also a limitation on the application. Another limitation which is **does not support the joint account functionality**. The Monefy only allow the user to have an account with a user and cannot be multiple users to manage the account.

2.6 Fin Art

Despite the applications that state on above, the Fin Art [8] also is a system that support the application on mobile devices web app in the laptop or tablet. It is an expenses management system which is founded in year 2018. It provides some functionality which is **categories the financial transactions** and it will **show the bar chart** to the user so that can manage the expenses or income. The user can **set the bills** such as electric bill, water bill, internet bills and so on. After the user is setting the bills repeated every month or year and so on. After the user make the payment, the user need to update the bill then only the transaction will be recorded. It can show in the figure 2.6.1. Not only that, but the user can also **record the amount of subscriptions channel** in this application.

Figure 2.6.1: Set bills of Fin Art [8]

Besides, the Fin Art application allows to user have a **separate account such as personal use and account for business use**. This will help the user manage the

personal expenses and business expenses separately. Moreover, the application provides the **set budget function** to let the user to define the amount that want to use in a period of time. The most strength of this application is it can **detect the transaction from notification of other applications**. However, it does not **contain the joint account** and does not support a family to use it to manage an account. The application also **does not support the social-financial positioning** to let the user know their financial position in this current society.

2.7 Cashew

The next application is Cashew [9]. Cashew is an expense budget tracker that founded by James from Dapper App Developer. The main functionality of this application is to **plan their finance** for every day, month or year. The user can **custom the personalized category** so that it will be more fulfil the user's need on the management of expenses. The application also **supports the back up and syncing features**. The user can back up the data to the google drive and this will become easier when the user wants to restore their data. Furthermore, the figure 2.7.1 show the main page of the application, it **is arranged neatly and full of information** such as the overview of the expenses of the month, the budget that set, the income and so on. This will help the user easier to view their financial situation in one shock.

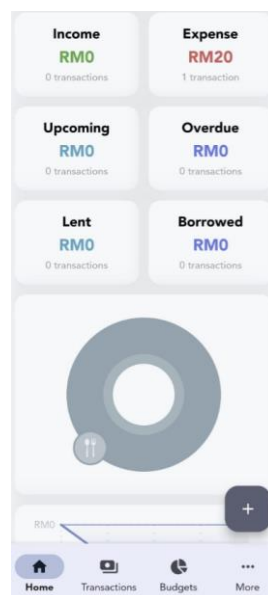


Figure 2.7.1: Home page full of information [9]

The **filter and search function** are helping the user a lot since they can easily to filter the transaction based on various conditions such as the date, category and so on. The Cashew application will also remind the user to pay the bills and remind the user to record the transaction every day. Other than that, the user is provided a **set budget function** to help the user plan the use of the money in better ways. Although it has many functions, but it **does not have the joint account functionality**. Therefore, it does not allow multiple individual users to manage an account. The application also **does not offer the suggestion on how to use the money** after the user set the limit of the amount. Another weakness is that the application does not support the user to know about their financial position in the current community.

2.8 Mony

Furthermore, the application Mony [10] is a personal expenses management system that created by the jojDevx. The application provides the main functionality which is **record every transaction with category the group** such as Food and beverage, transportation and so on. However, it **does not support the subcategories** hence the user cannot have more details on category the expenses. The user can **schedule the future transaction** and **open the notification of the application**. Therefore, the application will remind the user to make the transaction. It is bringing a lot of convenience to the user and the user would not forget to make the payments. Moreover, it allows the **user to back up their data in the application**. This will let the user to restore the data if the user is changing to another devices. In other part, the application also provides the **set budget function** so that the user would not exceed the budget they set in certain area. In all, the Mony application is a simple and user-friendly application, but the **joint account function is not available** in this application. The user also **cannot view their financial position in the society**. The Mony application **will not give the suggestion** on how to use the money after setting the budget.

2.9 Fast Budget

In addition, the Fast Budget [11] also a personal expenses manager app that allow the user to track their expenses, set the budget and so on. In the application, the **user can categorize when record the transaction**. The application also allows the user to **arrange the dashboard** with some features such as add the summary of the transaction in seven days, the transaction that make by the user, the account amount, the **budget that set by the user** and so on. This will make the user easier to view the overall transaction that make by them.

Moreover, the user can **record their credit card inside the Fast Budget application**. The user can fill up the limitation of the amount of the credit card and the interest rate of the credit card. The application will show the transaction that make by the credit cards. Not only the credit card, but the application also allows **the user to connect their bank account**. This can let the application to retrieve the balance of the user's account and the transaction that make by the user via the bank. The strength of this application is it able **to let the user to add more transaction at one time**. For example, the user can enter three transactions with different category at one time. This function will attract the user since it is convenience and no need to set the data time for many times. However, the weakness of this application is **does not have the joint account** to let multiple individual users to manage the account. Another weakness is it does not have a section that show the **finance situation of current society**. Hence, the user would not know about the financial position in this society. The last weakness is that the application would **not give the financial suggestion** to the user about how to use the money after the user was set the limitation of the expenses.

2.10 Track Wallet

The last application is Track Wallet [12]. It is a budget expenses system that help user to manage their finance effectively. The user can **record their expenses** through the application and the **transaction can be categorized** in more detail. The application also **provides the dashboard** to the user so that the user can view the summary of their expenses, income, **budget setting** easily. The dashboard includes the transaction of every day, the amount of the account left, the cash flow of the user, the pie chart of the expenses and the budget that set by users. The user can edit the dashboard based on their needs as well. Furthermore, the application **supports the recurring transaction**, the recurring transaction is the user schedule the transaction and the transaction will occur every month, ever week or every year. The user will also set the time so that the application will remind the user to make the transaction. It is very useful to the user who are always forgot to make payment of bills.

Besides, the Track Wallet application has **a section that call analytics**. The figure 2.10.1 is show the section to **analysis the financial statements** of the users such as the average expenses, the cash flow of transactions and the comparison of the expenses for this month and last month. All in all, there are many functionalities that involve in this application. Nevertheless, the application **does not support the joint account** and it is not convenience to the users with a couple since they cannot manage the account together. Not only this, but the application will also **not provide any financial suggestion on how to utilize the funds** so the user may not be able to use the money well. The last weakness of this application is it **does not provide the section to let the user to view their financial position in the current society**.

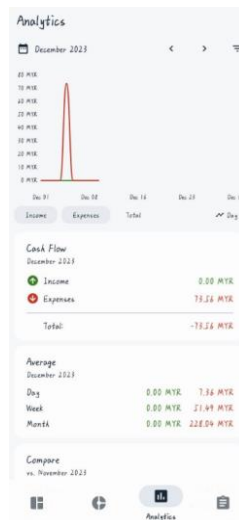


Figure 2.10.1: Analytics section of Track Wallet [12]

2.11 Compare and Contrast of the Reviewing System

Table 2.11.1: Compare and contrast of different personal expenses management system.

	Money Lover	Spendee	Money Manager	Wallet	Monefy
Add transactions with different main categories	YES	YES	YES	YES	YES
Add transaction to subcategory	YES	NO	YES	YES	NO
Overview of transaction with graph and chart	YES	YES	YES	YES	YES
Budget Setting	NO	YES	YES	YES	NO
Share Wallet	NO	YES	NO	NO	NO
Joint account function	NO	NO	NO	NO	NO
Finance Recommendation on how to utilize the amount that set by user	NO	NO	NO	NO	NO
Finance Position in society	NO	NO	NO	NO	NO

Table 2.11.2: Compare and contrast of different personal expenses management system.

	Fin Art	Cashew	Mony	Fast Budget	Track Wallet
Add transactions with different main categories	YES	YES	YES	YES	YES
Add transaction to subcategory	NO	NO	NO	YES	YES
Overview of transaction with graph and chart	YES	YES	YES	YES	YES
Budget Setting	YES	YES	YES	YES	YES
Share Wallet	NO	NO	NO	NO	NO
Joint account function	NO	NO	NO	NO	NO
Finance Recommendation on how to utilize the amount that set by user	NO	NO	NO	NO	NO
Finance Position in society	NO	NO	NO	NO	NO

Table 2.11.1 and Table 2.11.2 presented the comparison of personal finance management system which include the Money Lover, Spendee, Money Manager, Wallet, Monefy, Fin Art, Cashew, Mony, Fast Budget, Track Wallet. One of the similar functions that can be found among these applications is able to add transaction with different categories. The applications can let the user to record the expenses, income, and transfers. For example, the user needs to choose the category for every transaction such as transportation, food and beverage and so on. Therefore, the applications can allocate the transaction well and make the user easy to review the transaction.

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The second similarity in these applications is their providing the overview of the transaction in the form of a graph and a chart. This function can let the user have a clear figure from their monthly transaction by generating the graphs or charts. Furthermore, this function provides different options for the user to choose based on a week, a month, a year or the period of time the user wants to view. Therefore, this function will enhance the convenience and the effectiveness for the user to track their expenses.

Despite of the similarities, the applications also include the differences between them. The first difference among the applications is some of the applications do not provide the subcategory functions. The user only can categorize the transaction into the main category. For example, the user can categorize the transaction into food and beverage then the user can continue to choose the subcategories which are dinner, lunch or breakfast. However, Spendee, Moneyfy, Fin Art, Cashew and Money does not support this function. Therefore, the user cannot record the transaction in more details and the user needs to enter manually in the note section.

The other difference between the applications is budget setting. The user is allowed to set their budget based on their need and the purpose of this function is to help the user to monitor their expenses to avoid overspending. Besides, this function also helps the user to be aware of their financial plan. Among the applications, Money Love and Moneyfy does not provide this function.

In other perspectives, the share wallet is also a difference between the applications. The user can open a share wallet on their own account and invite their friends or family members to join the share wallet so that they can manage the wallet together. However, the member of the share wallet has the limitation on the function and only the owner can have the full function of the share wallet. This function is only available for Spendee and the others lack of this part.

On the other hand, all the applications are lack of the joint account function, financial recommendation on how to utilize the amount that set by user and the function of knowing their financial position in the current society. Since the existing application does not contain those functions, thus it will be the innovation part of the project.

CHAPTER 3

System Methodology

3.1 Project Development

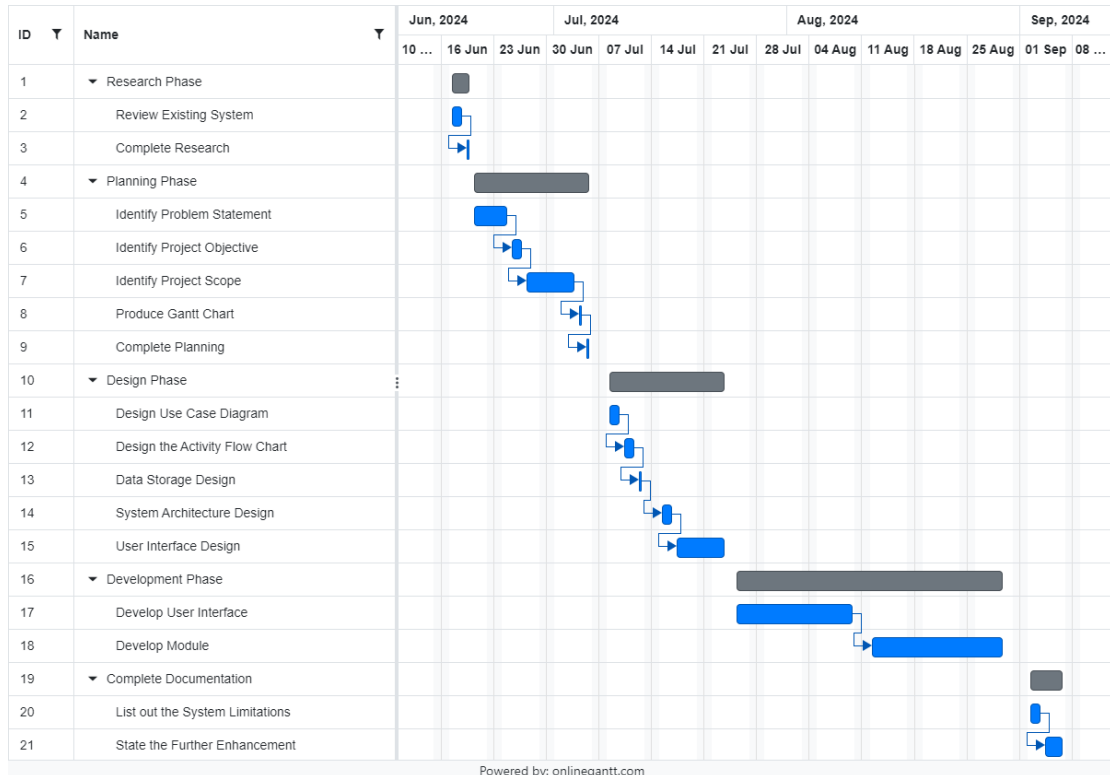


Figure 3.1.1: Gantt chart of the FYP 2

Figure 3.1.1 show that in the beginning of the project, the research phase is on-going to review the existing system that are available in the marker so that it can make the comparison of the existing system. After completing the research phase, the problems statements of the existing system and the project objectives of the new project is identified. Besides, the project scope will also explain all the function that are available in the new system and in this phase, the Gantt chart will be drawing to estimate the time of create the project. Then, the design phase is used to design the use case diagram of the project, explain the activity flow of the system, decide the data store that used in the project, the system architecture design and the user interface design. The last is the development phase, in this phase, the user interface will be developed, and

the module of the project will be developed. After the development phase is completed, the documentation needs to be completed. The system limitations and the further improvement needed to state in the documentation so that it can be easily improve and make the system complete in the future.

3.2 Information Gathering

The main data collection in the personal expenses management system is the “Belanjawanku 2022-2023” [13]. This is an expenditure guide for Malaysia individuals and family. In this system, it used to as a guide for the user to set the budget. The system will ask some questions to get to know the user’s personal information and do the analysis based on the expenditure guide.

3.3 System Functionalities

Figure 3.3.1 is the diagram about the overall system functionalities of Personal Expenses Management System. The system includes some functions, such as the login and register account. Besides, if the users forget their password, they can also reset their password. The system will check the validity of the username before allowing the users to change their password. Furthermore, the users can perform the set budget function. The system will also check the existing budget's date, if the date of budget set is overlapping then it will notice the user to delete the existing budget or edit the date of the new budget. The system will also perform the budget recommendation for the user so that it can help the newbie of the system to fully utilize their expenses. In addition, the users are able to record their transactions and select the category. After recording the transactions, the users are able to view the transaction record in the main page of the system. The user can also click the transaction to perform the edit and delete function. In order to let the system to generate the summary report to the users in the pie chart form, the users can select the budget set in the main page. After the user selects the budget set, the system will filter all the transactions based on the start date and end date of the budget set. Moreover, the joint account function is included in the system. The users can create the joint account and invite the other users to join the joint account. The system will perform the duplicate invitation check so that it ensures the users would not send the duplicate invitation to the same person. Then, the invited user will receive the notification and decide to join the joint account. After the user joins the joint account, the members and the owner of the joint account can perform all the functions in the system such as add the transaction, delete transaction, edit transaction and set the budget. The users can also disjoin the account if they want to leave the joint account.

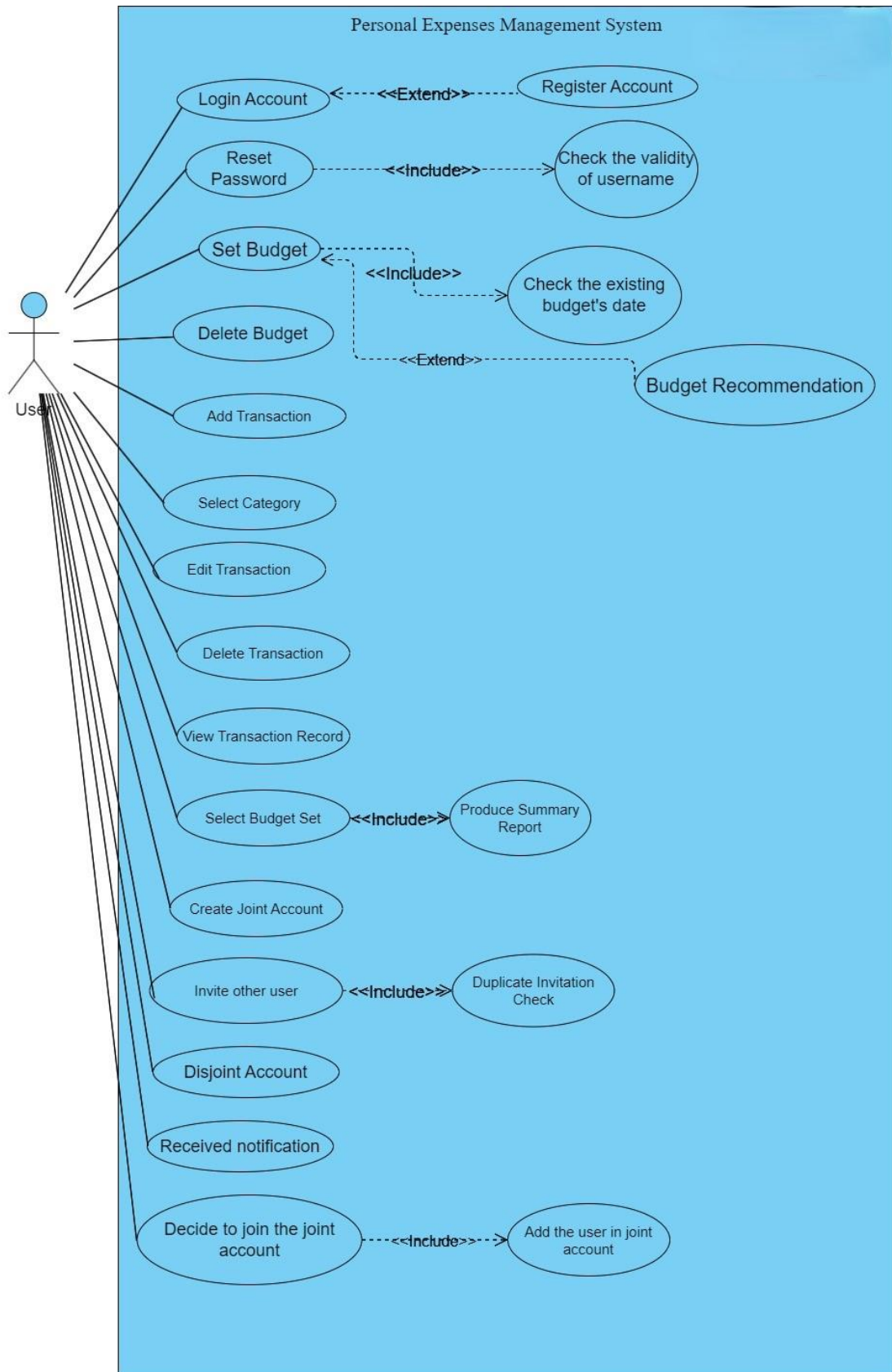


Figure 3.3.1: Overall system functionalities of the Personal Expenses Management System.

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Figure 3.3.2 is the process of give budget recommendation. The user can click the “Budget Recommendation” button to intent to the budget recommendation page. This function is used to help the newbie to fully allocate the expenses in each category. The system will provide a few of the questions to let the users to answer. After the user answering the questionnaire, the system will analyse the data following the “Belanjawanku 2022-2023”. The answer that given by the user will do a matching in the database then only will show the budget recommendation to the user in the pie chart from. If the user wants to use the budget that recommended by the system, the system will ask the user to input the budget name, amount they want to allocate, start date and the end date of the budget. After the user click the save button, the system will check the date of the existing budget. If the date is overlapping then the system will display “A budget set with overlapping dates already exists, please delete before create new budget” else the budget set will create successfully and store in the database. When the users choose not to use the budget recommendation, then the users can click the cancel button and back to the main page.

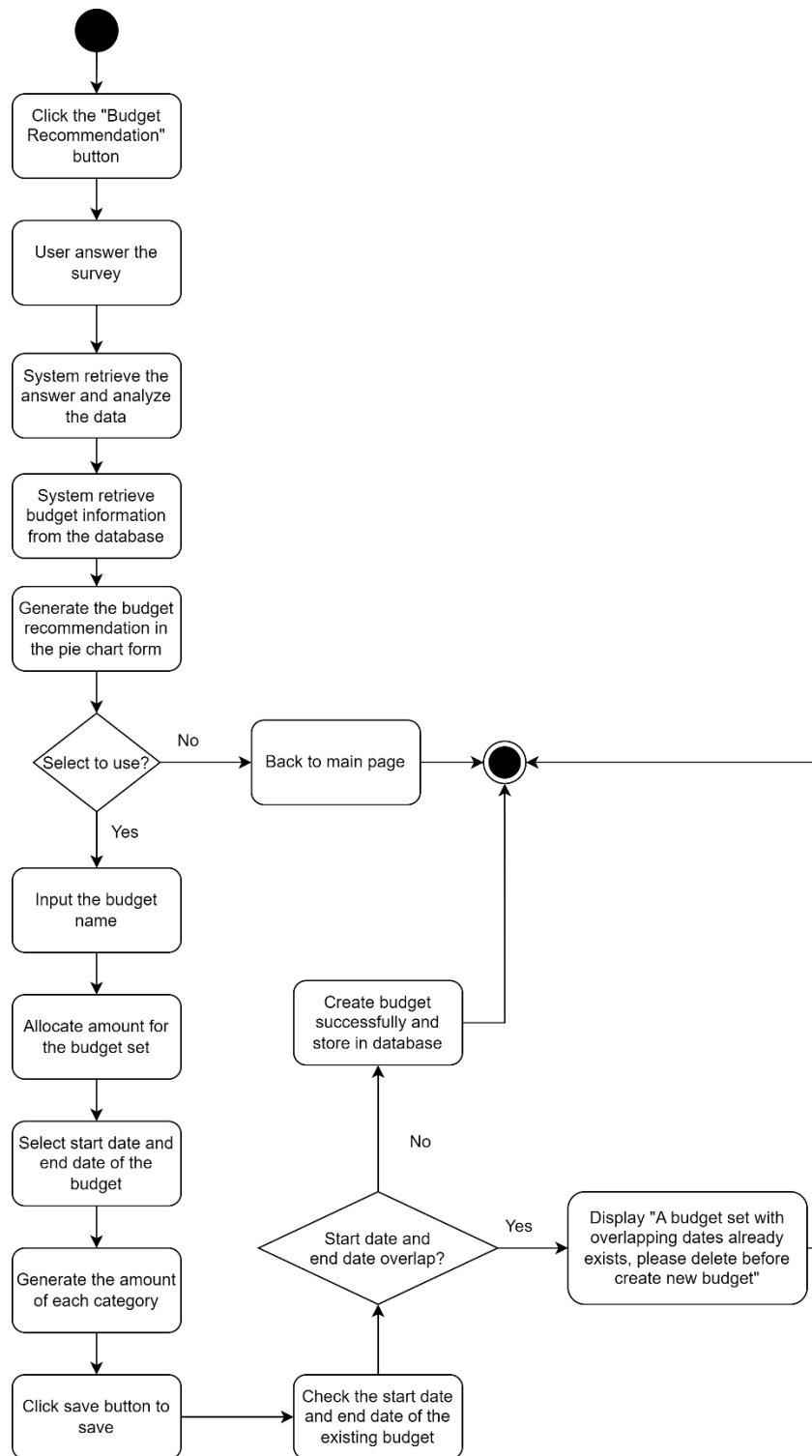


Figure 3.3.2: The Process of Give Budget Recommendation.

The figure 3.3.3 is the process of the creates joint account. The user needs to open a joint account before invite the other user. After open a joint account, the user can click the invite button and enter the email of the invited user. The users need to click the send button to send the invitation. If the invitation is duplicate send to the same user, the system will prompt “Invitation already sent to this email” to the user.

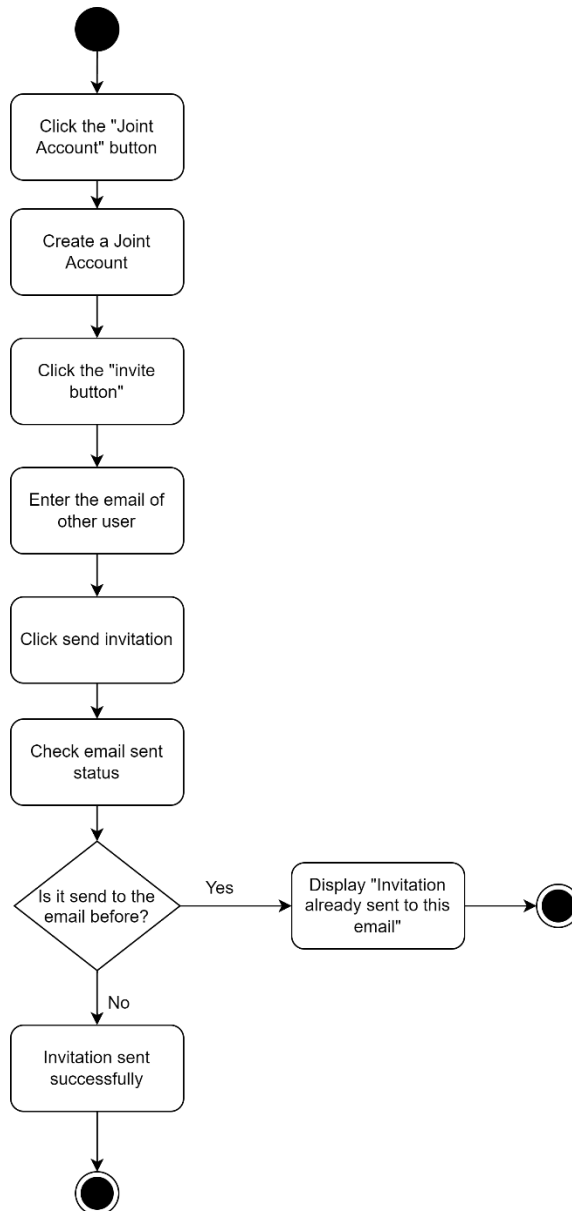


Figure 3.3.3: The Process of Create Joint Account.

The figure 3.3.4 shows the process of invitation responds from the users. The user can click the notification button to check the invitation. The invitation will show the name of the joint account and the invitation is sent by who. The users can make the decision to join the joint account. If the users click the “accept” button, then the invited user will join the joint account successfully, else the user can click the “decline” button to reject the invitation.

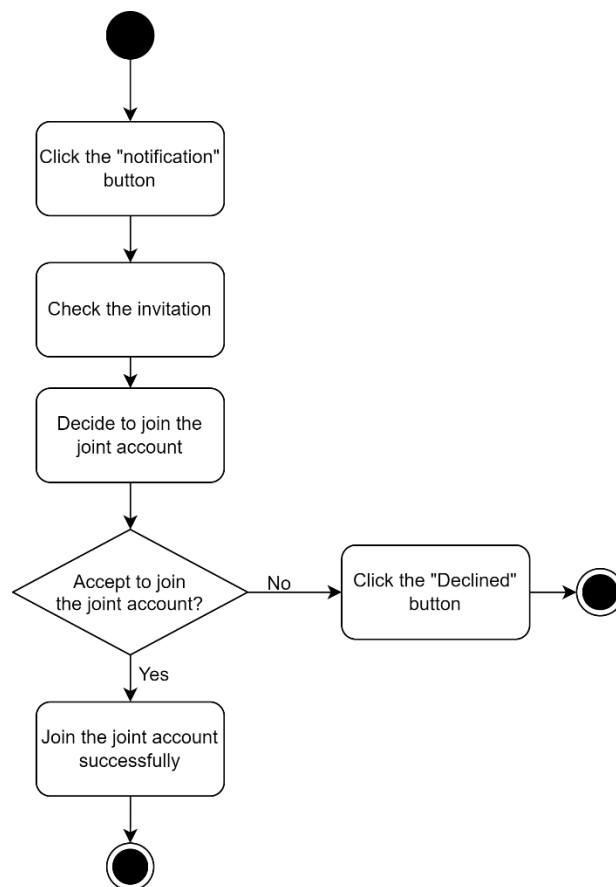


Figure 3.3.4: The Process of Invitation Respond.

Figure 3.3.5 shows the process of disjoint account. If the users want to leave the joint account, the users can click the disjoint button. When the users click the disjoint button, it will alert a dialog to double confirm that the users want to leave the joint account. The system will also check the role of the users in the joint account. If the owner disjoints the account, all the members will leave the joint account and cannot perform any function. If the members disjoint the joint account, only the member themselves will leave the joint account, but the other members and the owner still can use the joint account.

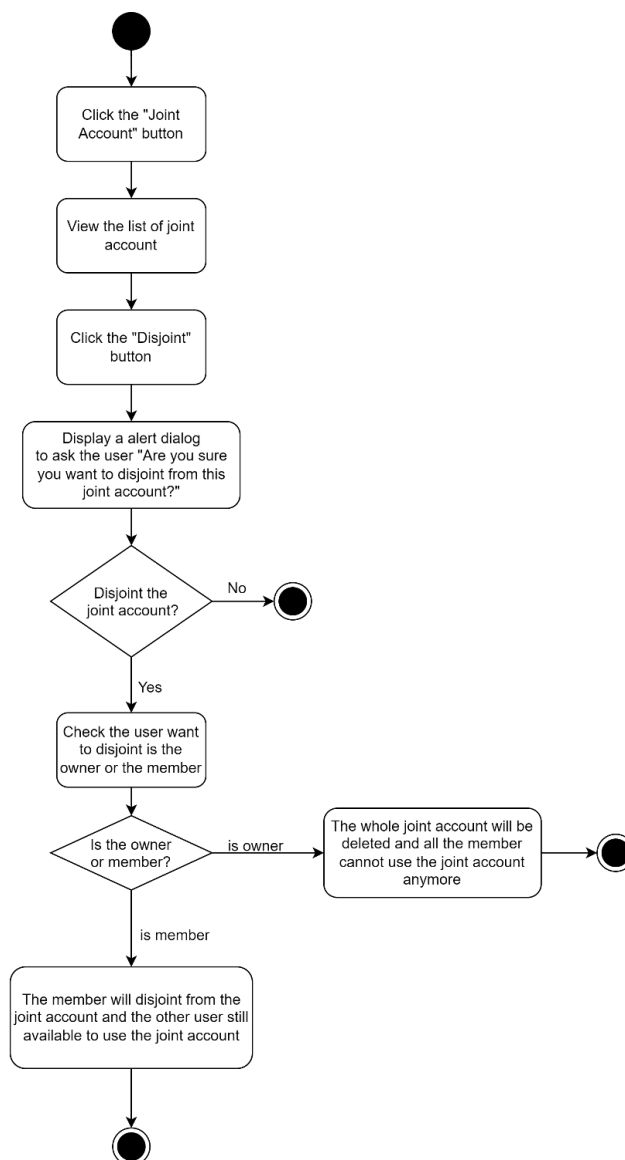


Figure 3.3.5: The Process of Disjoint Joint Account.

Figure 3.3.6 shows the process of set budget. The users can also customize the budget by manually. The user can enter the budget name, decide the start date and end date, select the category and allocate the amount of each category. Then, the users can click the “create” button to create the budget set. However, before the budget set created, the system will check the date of existing budget set so that the date of the new budget will not overlapping. If the date does not overlap, then the budget set will create successfully and store in the database.

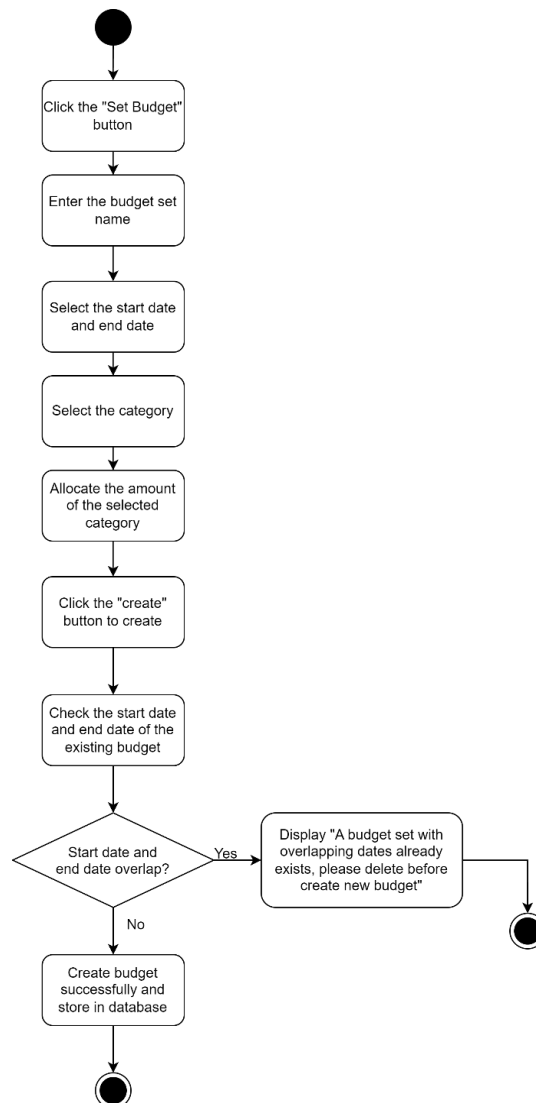


Figure 3.3.6: The Process of Set Budget.

CHAPTER 4

Design of System Prototype

4.1 System Architecture Design

The figure 4.1.1 show the system involved the 3-tier architectures pattern which include the presentation layer, application logic layer and the data layer. In the presentation layer, the user will interact with the system through the user interface. The user interface is used the XML layout file to create, and it will display to the mobile after set the content view in the java class. As an example in the personal expenses system, the main colour used in the user interface is the green and beige colour. The presentation layer includes the login screen, sign up screen, transaction dashboard, add transaction screen, edit transaction screen, joint account screen, budget set screen, budget overview screen and report screen. These screens can let the user have a clear visual when using the application.

Besides, the application logic layer process the data that given by the users or the request that make by the user in the presentation layer. This layer will handle the activity and communication between the presentation layer and application logic layer. For example, the personal expenses system includes many functions such as the **user can login their account, register the account and reset the password** if they forget the password. Furthermore, the personal expenses system also able to let the user to **add the transaction to the account, delete and edit the transaction to the account**. In order to **let multiple users to join the joint account**, the personal expenses system also includes the function which is **create a joint account and invite the other users** to join in. The invite users can **choose to accept or decline the invitations** as well. In addition, the **budget recommendation** is a function to help the newbie to manage their expenses for each category. If the users do not need the budget recommendation, they can also **create a budget set** based on their preferences. This can help the user to fully utilize the expenses of each month. The users can also know that how much they actually spend based on the budget set. Not only that, but the user can also **delete the budget set** when they are not using the budget set anymore. After the budget set, the

user can click to generate the report in the pie chart form, so that can let the user to know the total amount they spend.

Lastly, the **data layer is used to store and manage the data in a database** by using the CRUD operations which is create, read, update and delete. This allows the system can easily to retrieve the data in a faster way and send back to the user. As example, the data layer include in the personal expenses system is the user information which contain the username, password and email. After the user add the transaction, it will also store all the transactions in the transaction record database so that the transaction record can be fetch out to do some calculations. Moreover, when the users create the budget set, it will also store in the database so that the user can use it to see whether the expenses is overspending or not. Not only that, but the budget recommendation data also store in the database. This budget recommendation database is let the system to perform the budget suggestions for the newbie who first time use the application. On the other hand, the user create joint account also will be store in the database, so that it able to let the owner and the invited user can manage the same account. Last but not least, the category record will also store in the database so that the user can choose the category when add the transaction.

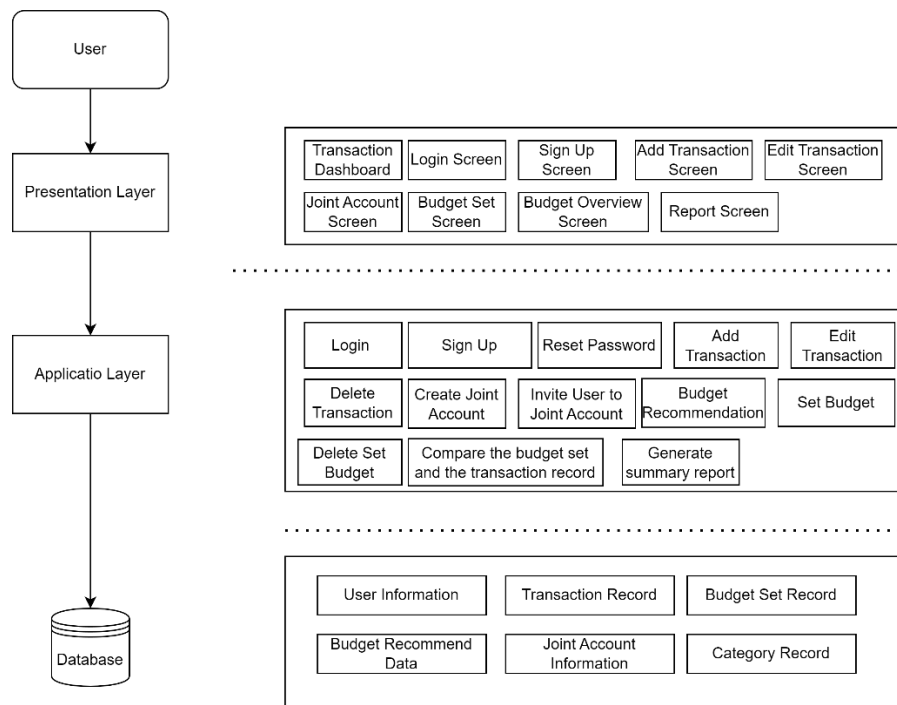


Figure 4.1.1: System Architecture Diagram

4.2 Graphical User Interface Design

Figure 4.2.1 show that the login page of the personal expenses management system. The users need to key in their username and password to login.

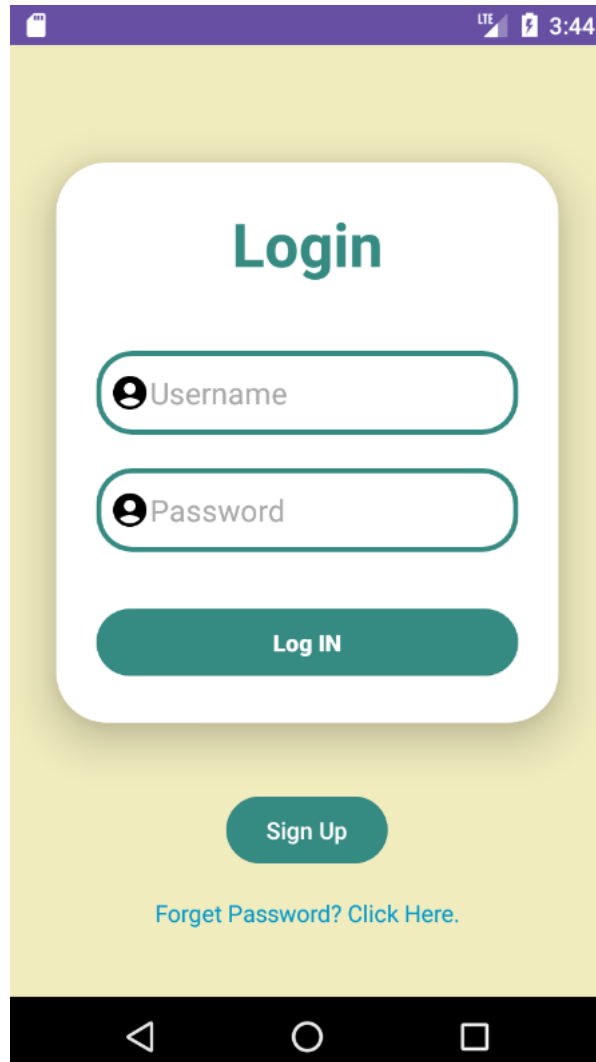


Figure 4.2.1: Screenshot of Login Page.

Figure 4.2.2 shows the sign-up page of the system. The user can register the account by enter their username, password and email address. If the username is registered before, it will show “User already exists” to the users.

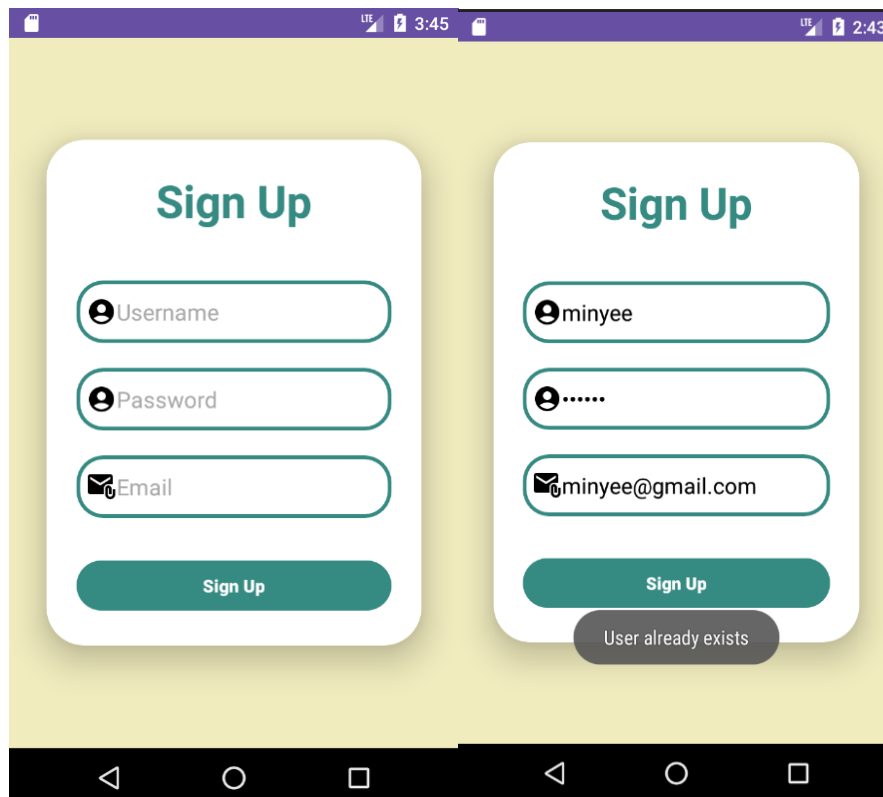


Figure 4.2.2: Screenshot of Sign-Up Page.

Figure 4.2.3 shows the reset password page. The user can reset their password if they forget the password. The users need to enter the username and new password. The system will check the validity of the username. If the username exists, then the new password will be updated.

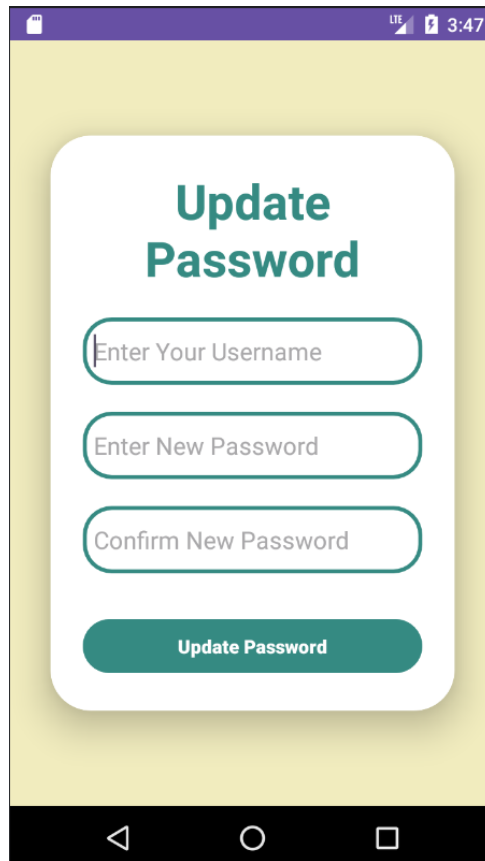


Figure 4.2.3: Screenshot of Reset Password

Figure 4.2.4 shows the main page of the personal expenses management system. The main page can view the transaction record, budget set and the pie chart. The user can choose the budget set and it will show the start date and end date of the budget. Then, the user can click the “fetch data” button, the system will filter out all the transactions based on the start date and end date of the budget set. The figure 4.2.5 shows the pie chart after filtering out the transaction by the date of the selected budget set.



Figure 4.2.4: Screenshot of Main Page

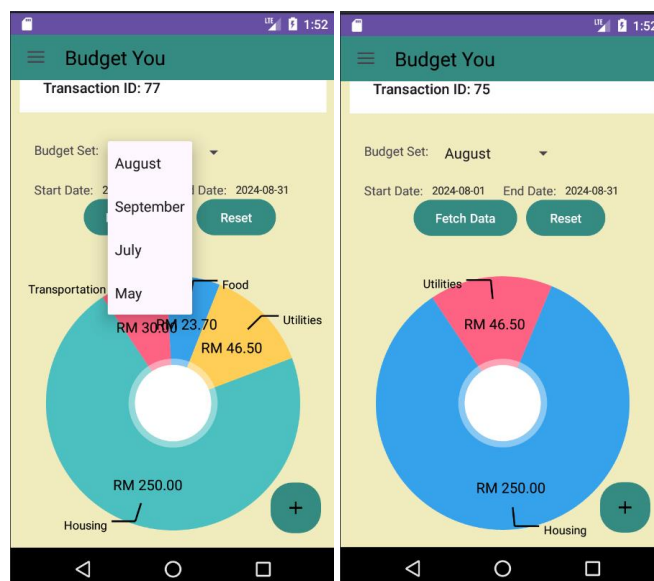


Figure 4.2.5: Screenshot of Pie Chart after Filtering Out the Transaction

The figure 4.2.6 shows the add transaction page. The user can enter the transaction name, amount, date, category and the transaction type to record the transaction. The user can also use the voice to input the transaction name. The user can click the save button and the transaction will be stored in the database which show in figure 4.2.7.

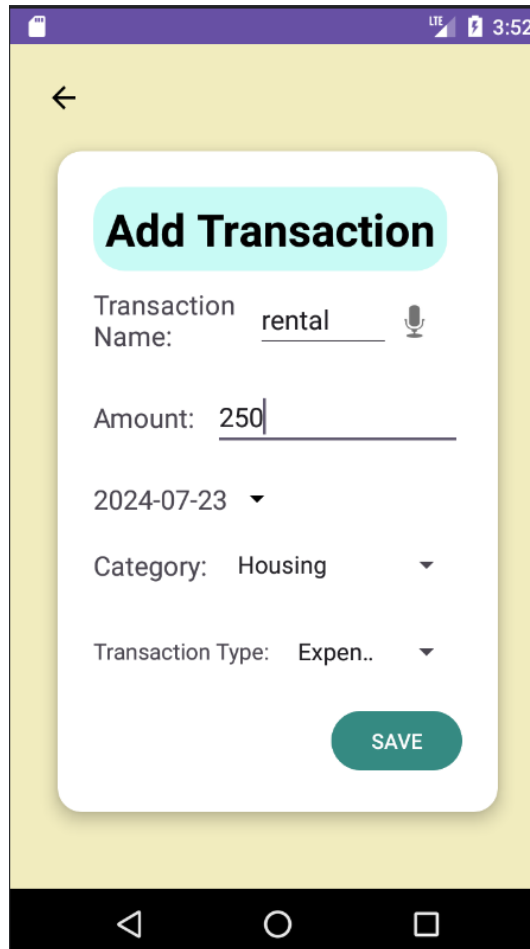


Figure 4.2.6: Screenshot of Add Transaction

	transaction_id	transaction_name	amount	date	userid	category_id	transaction_type_id
<input type="checkbox"/> Edit Copy Delete	72	noodles	6.50	2024-09-02	187	1	2
<input type="checkbox"/> Edit Copy Delete	73	Car Oil	30.00	2024-09-05	187	4	2
<input type="checkbox"/> Edit Copy Delete	74	electric bill	43.00	2024-08-22	187	5	2
<input type="checkbox"/> Edit Copy Delete	75	water bill	3.50	2024-08-31	187	5	2
<input type="checkbox"/> Edit Copy Delete	76	rental	250.00	2024-08-09	187	2	2
<input type="checkbox"/> Edit Copy Delete	77	dinner	15.00	2024-09-02	187	1	2
<input type="checkbox"/> Edit Copy Delete	78	Bread	2.20	2024-07-01	187	1	2
<input type="checkbox"/> Edit Copy Delete	80	rental	250.00	2024-07-23	187	2	2

Figure 4.2.7: Screenshot of the database of transaction.

Figure 4.2.8 show the edit transaction function. The user can edit the transaction by click the transaction record. The users can edit the transaction name, amount, date, category and the transaction type then click the “save” button to update to the database.

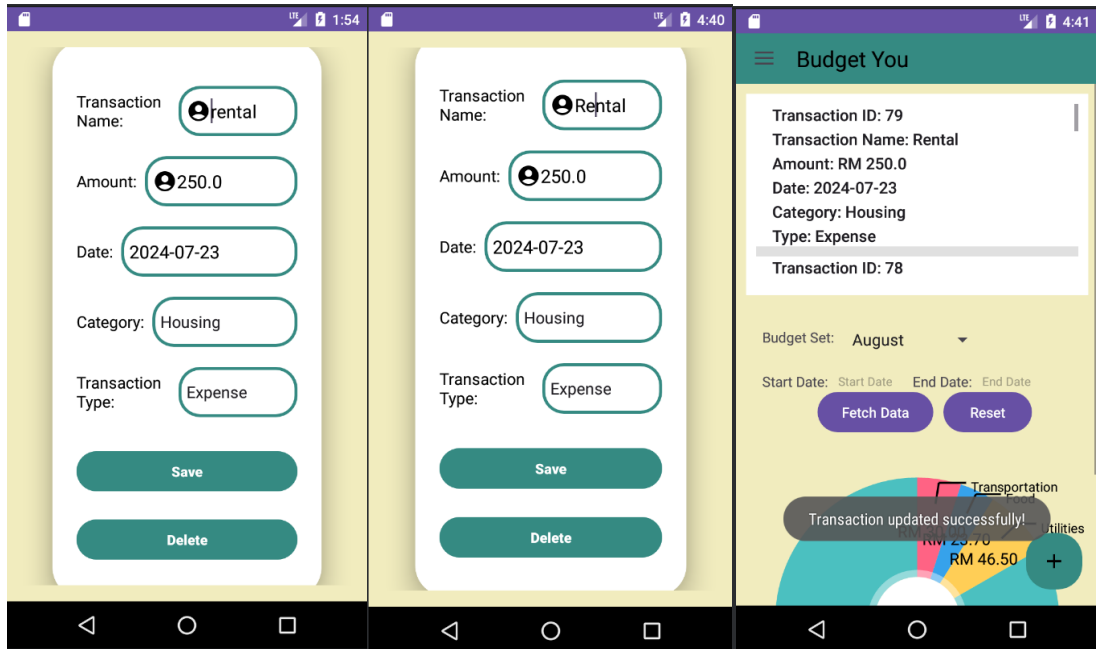


Figure 4.2.8: Screenshot of Edit Transaction and the Main Page after Update the Transaction.

Figure 4.2.9 shows the delete function of the system. The users can click the “delete” button to delete the transaction and it will be updated to the database.

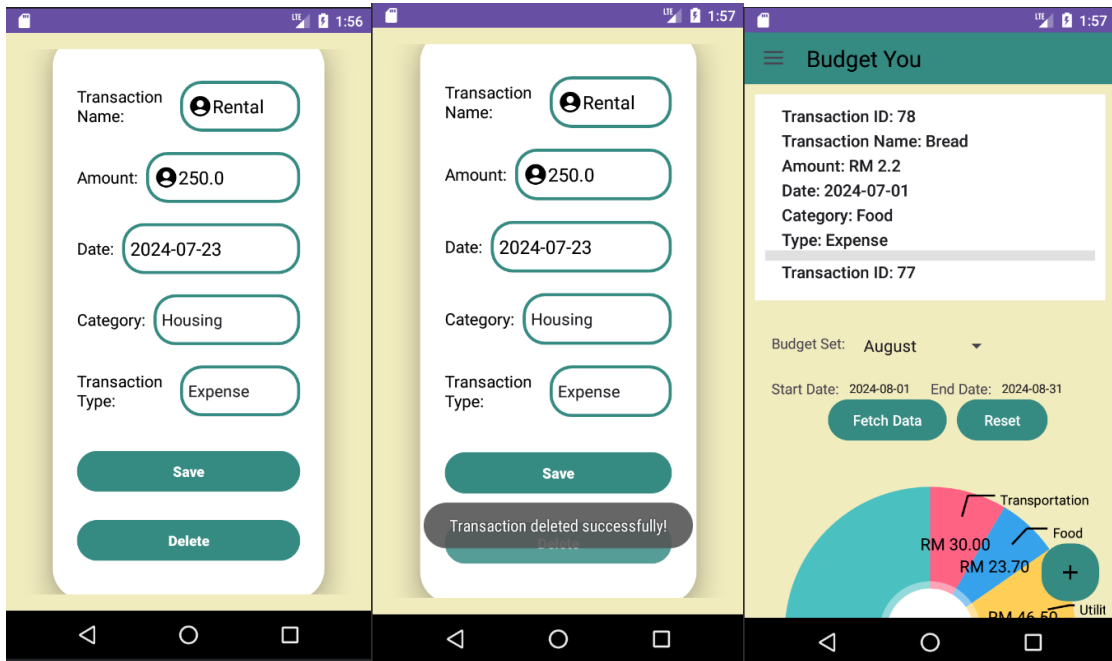


Figure 4.2.9: Screenshot of Delete Transaction and the Main Page after Update the Transaction.

Figure 4.2.10 shows the drawer of the system. It contains the joint account, budget preferences, budget recommendation, set budget, notification and the sign out.

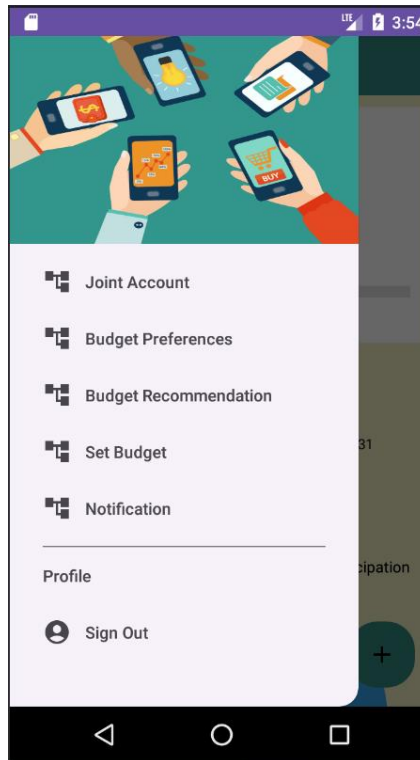


Figure 4.2.10: Screenshot of Drawer of the System

Figure 4.2.11 shows the joint account page, the user can enter the joint account name and click the “Create Joint Account” button to create the joint account. After the joint account was created successfully, the main page of joint account will show.

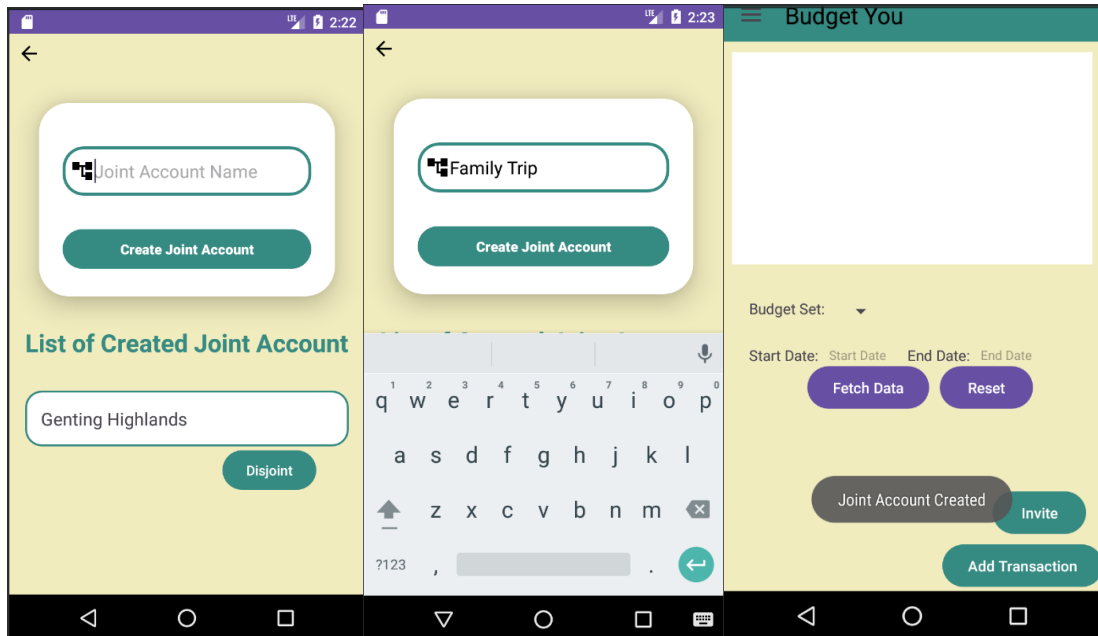


Figure 4.2.11: Screenshot of Create Joint Account

Figure 4.2.12 shows the invite user page that invite the other user to join the joint account. The users can enter the email address of the invited user and click the “send” button to send the invitation. If the users send the invitation duplicate, the system will notice the users that the invitation is sent before.

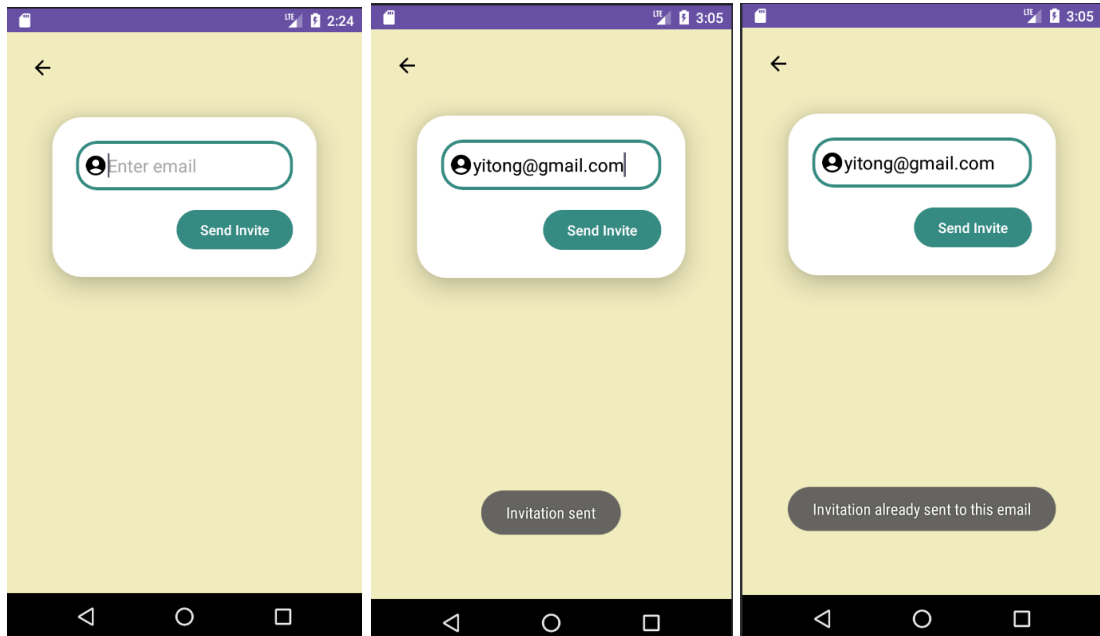


Figure 4.2.12: Screenshot of Invite User

Figure 4.2.13 shows the drawer of the joint account. It contains the personal account, budget preferences, set budget and sign out. The users can click the personal account in the drawer to back the main page of the personal account.

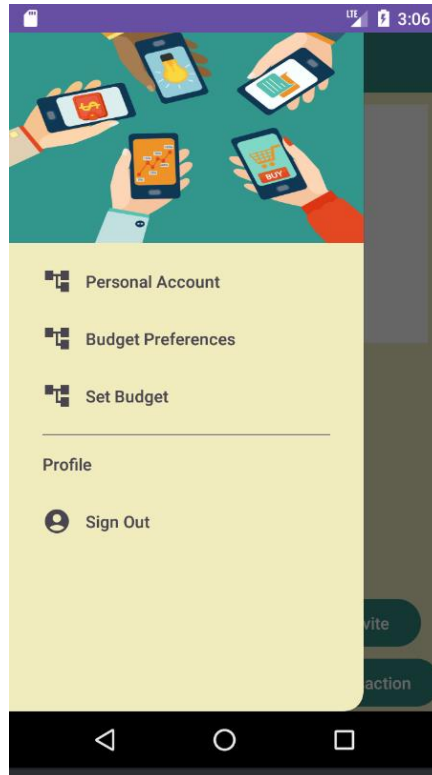


Figure 4.2.13: Screenshot of Drawer of the Joint Account

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Figure 4.2.14 is the notification page. The invited user will receive the notifications when the users send the invitation to the invited user to join the joint account. Then the invited user to decide whether to join the joint account.

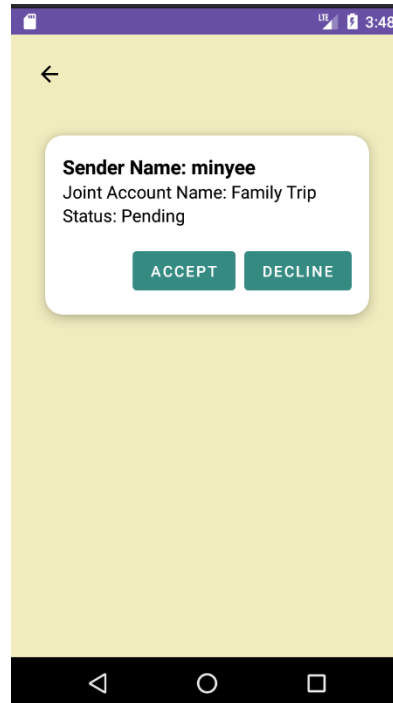


Figure 4.2.14: Screenshot of notification page

Figure 4.2.15 shows the list of the joint account. After the invited user are accepting the invitation of the joint account, the joint account page of the invited user will show the joint account that accepted just now. Then, the invited user can click the joint account to perform some functionalities in the joint account.

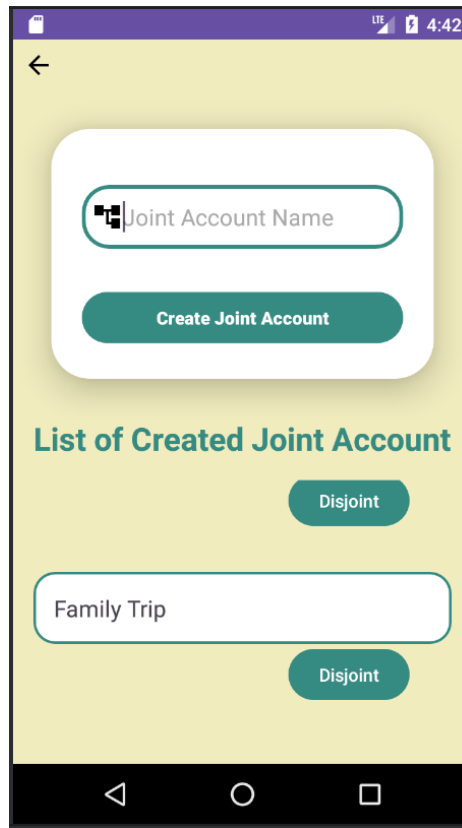


Figure 4.2.15: Screenshot of List of Joint Account Page

Figure 4.2.16 shows the disjoint account page. The users as an owner or members can decide whether to disjoint the joint account. When the users click the “disjoint” button, the alert dialog will prompt out and make a confirmation from the users.

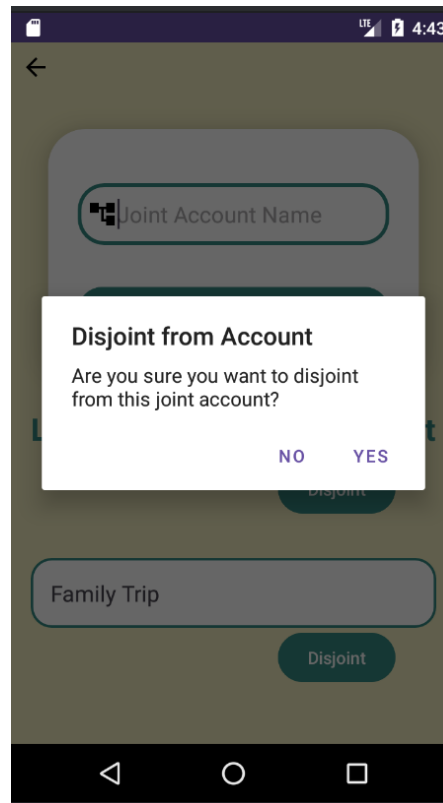


Figure 4.2.16: Screenshot of Disjoint Joint Account

Figure 4.2.17 shows the set budget page. When the users click the set budget, it will prompt the alert dialog to let the users to enter the budget set name.

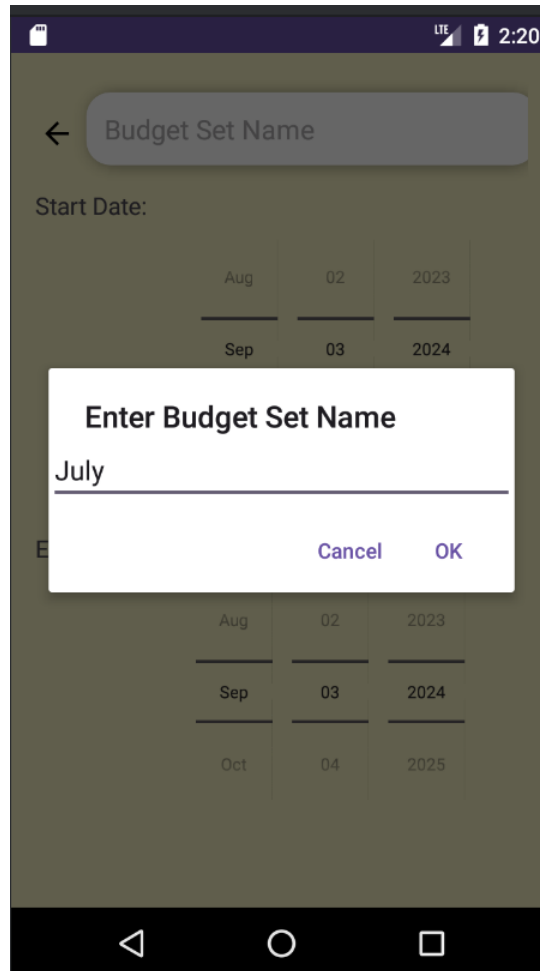


Figure 4.2.17: Screenshot of Set Budget.

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Figure 4.2.18 shows the set budget. The users can edit the budget name at the top of the page. Then, the users need to select the start date and the end date. The users can also choose the category that they want to set budget and allocate the amount for each category. Then, the user can click the button to create the budget.

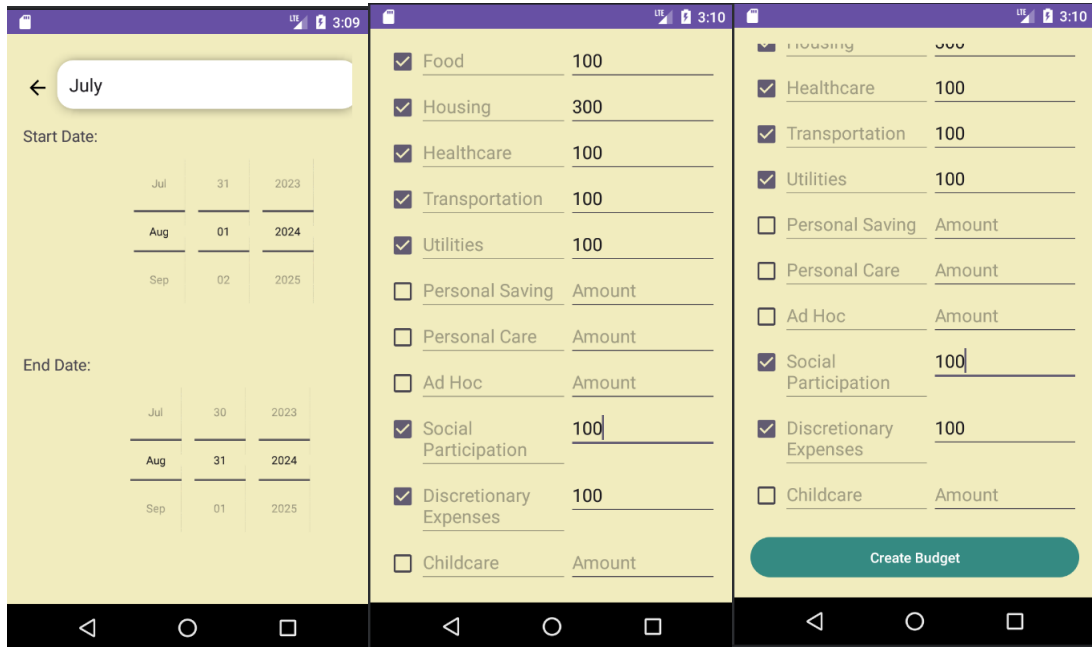


Figure 4.2.18: Screenshot of Set Budget.

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The figure 4.2.19 shows that if the date of the budget set is overlapping, then the system will prompt out the notice to let the users know the budget set is overlapping. The users can decide whether to delete the existing budget or change the date of the new budget.

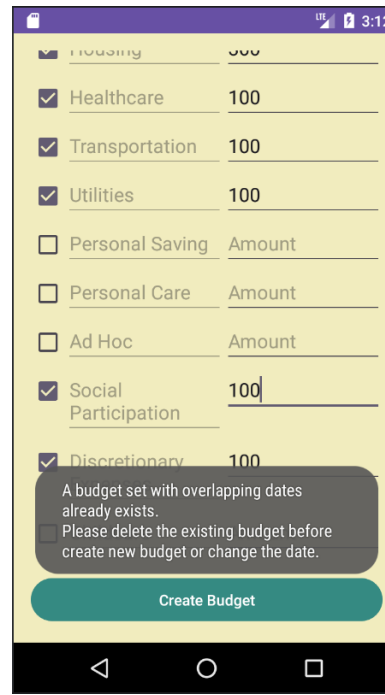


Figure 4.2.19: Screenshot of Overlapping Budget Set.

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Figure 4.2.20 shows if the date of budget set is not overlapping then the budget set was created successfully.

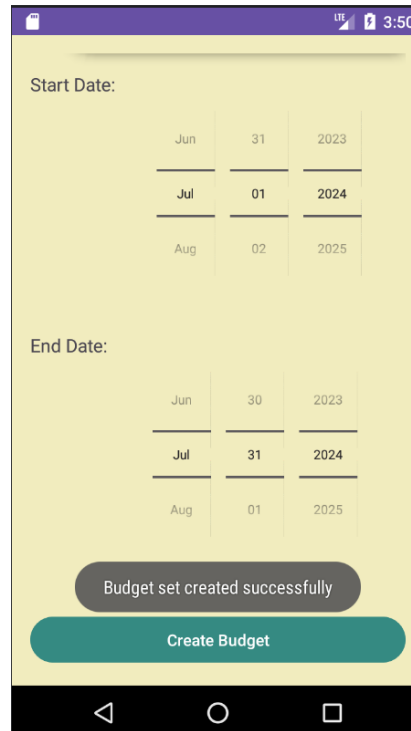


Figure 4.2.20: Screenshot of Create Budget Set Successfully.

After the users set the budgets, the users can view the budget set by clicking the budget preferences in the drawer. Figure 4.2.21 shows the budget sets and the budget items that created by the user. The user can click the budget set and view the budget items. Besides, the user can delete the budget set as well by clicking the delete icon. The figure 4.2.22 shows the users can click the “accept” button to view the remaining amount of each category by filtering the transaction record.

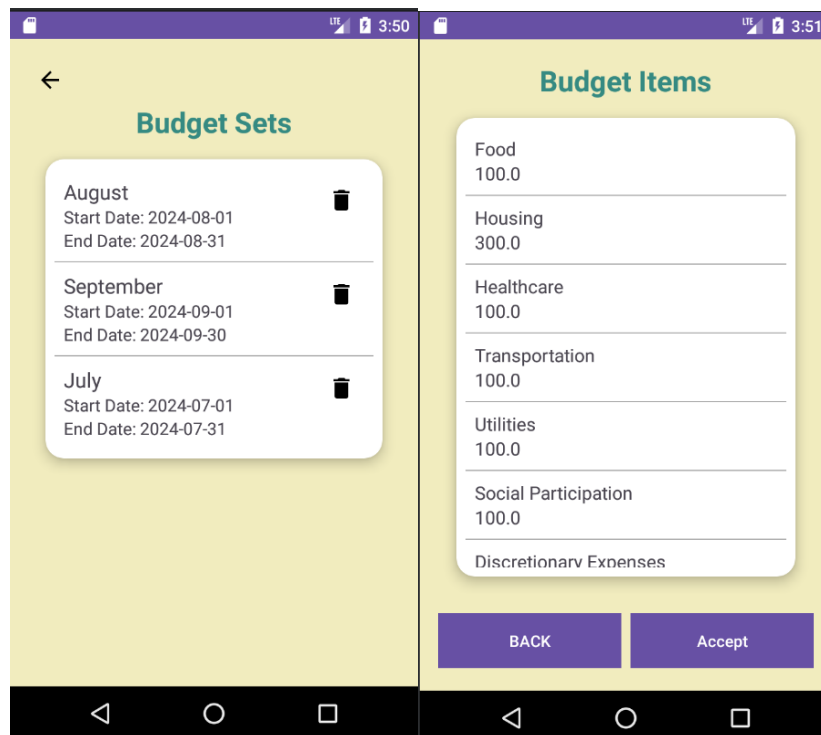


Figure 4.2.21: Screenshot of Budget Sets and Budget Items.

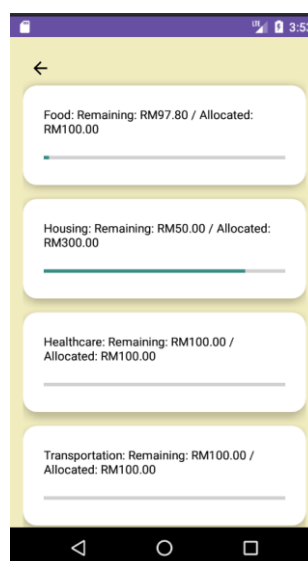


Figure 4.2.22: Screenshot of Remaining Amount of Each Category.

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The questionnaire is conducted by the user to get the budget recommendation. After answer a few questions, the budget recommendation are generated. The users need to choose their living state and the household category. If the users choose single, then the system will ask the transportation of the users which show in the figure 4.2.23.

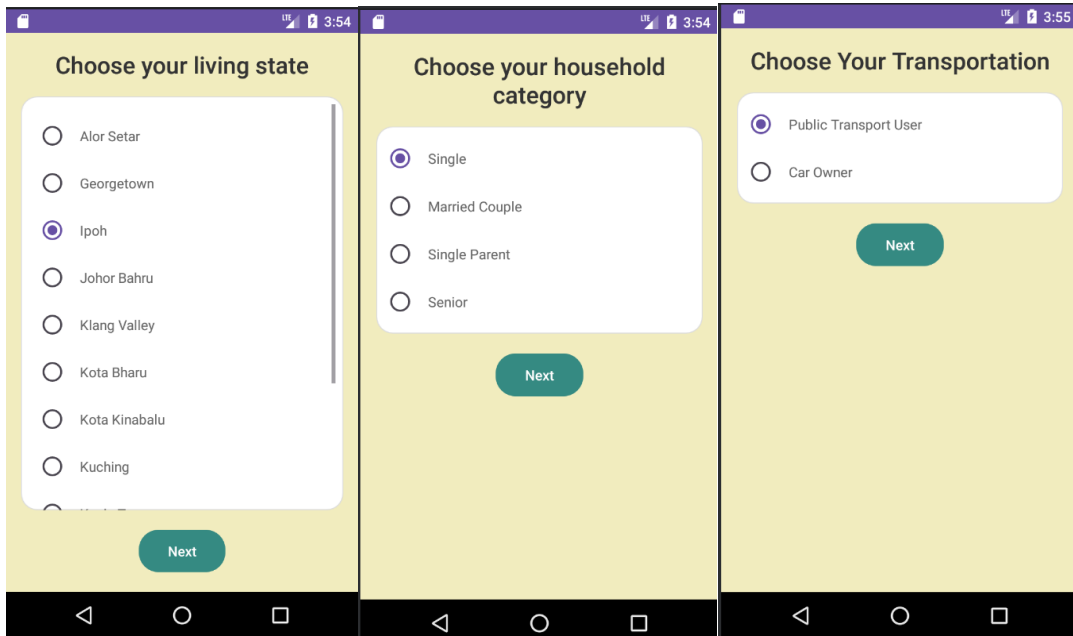


Figure 4.2.23: Screenshot of Questionnaire.

If the users choose the household category is married couple or single parent, then it will ask the number of the children of the users which show in figure 4.2.24.

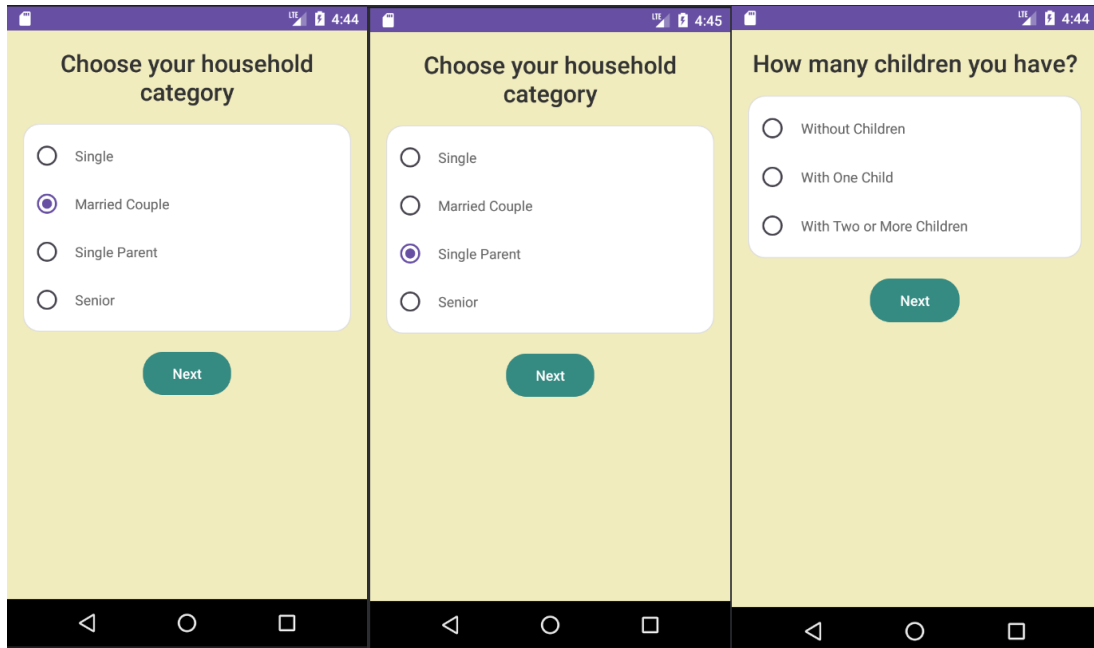


Figure 4.2.24: Screenshot of Questionnaire.

If the users choose the category is the senior, then the system will ask the senior is single or have a couple which show in figure 4.2.25.

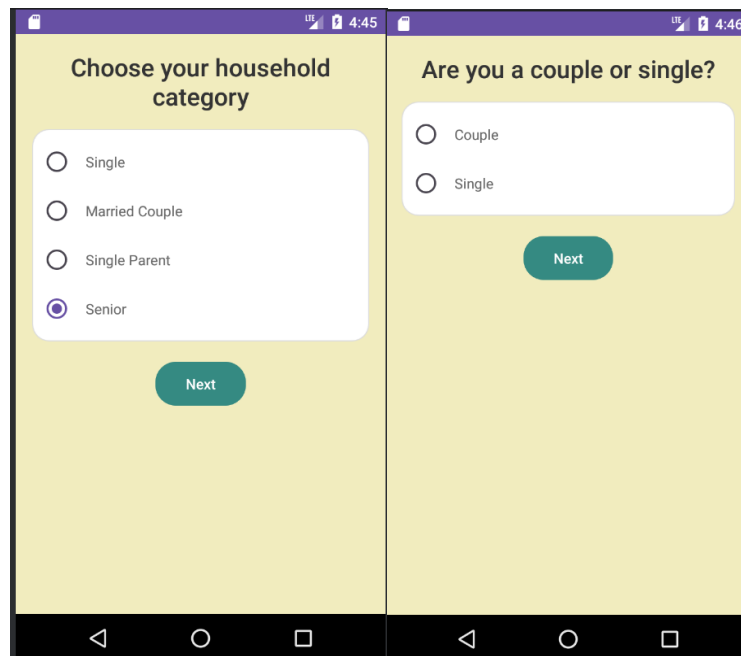


Figure 4.2.25: Screenshot of Questionnaire.

After the system retrieve all the answer from the users, the system will make the analysis and retrieve the data from the database. Then, the system will generate budget recommendation in a form of pie chart with the percentage which show in the figure 4.2.26. The user can choose to use it or reject to use.

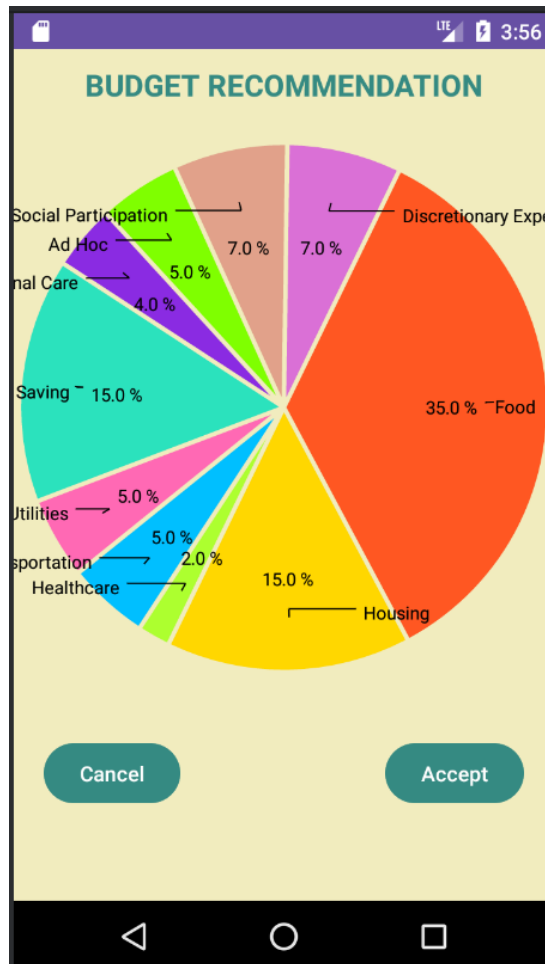


Figure 4.2.26: Screenshot of the Budget Recommendation.

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The figure 4.2.27 show after the users accept to use the budget recommendation. When the users accept to use the budget recommendation, the users need to enter the budget name, the amount that needs to be allocated, the start date and the end date. Then, click the “Submit” button to create the budget. When the “Submit” button is clicked, the system will also check the date of the existing budget. The new budget will be created successfully if they do not overlap with the existing budget. The new budget will be added into the main page which show in the figure 4.2.28 as well in order to let the user to choose for viewing the transaction.

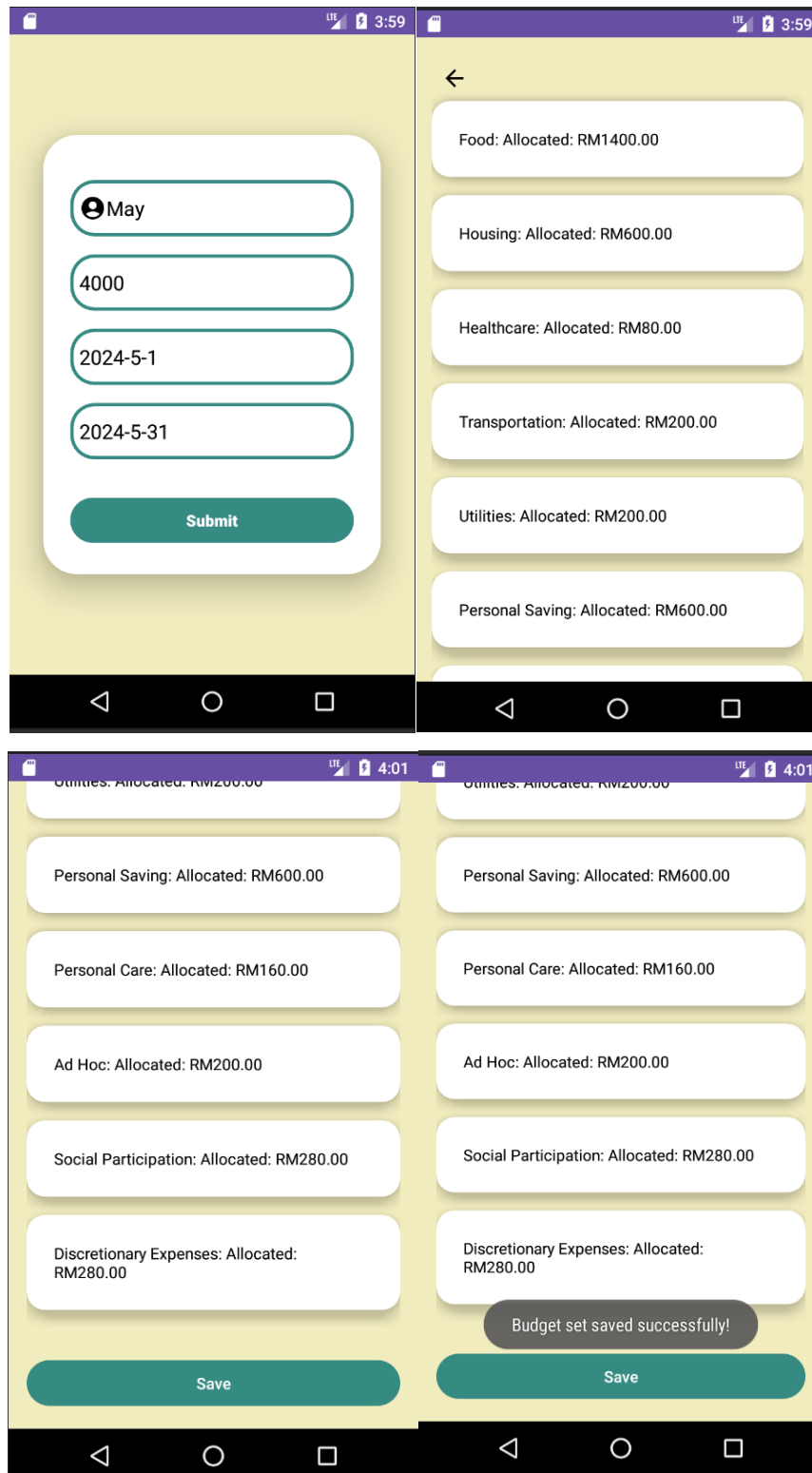


Figure 4.2.27: Screenshot of the Accept the Budget Recommendation.

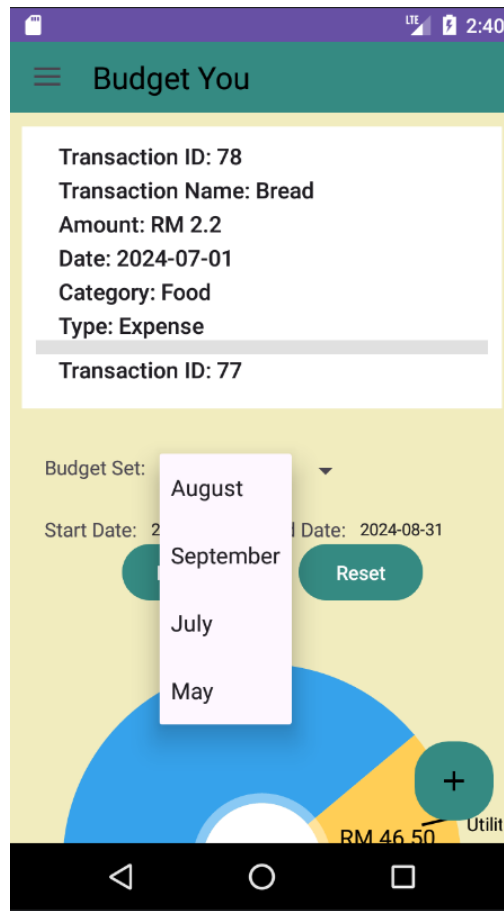


Figure 4.2.28: Screenshot of the Main Page after Adding New Budget.

4.3 Data Storage Design

The database table format that used in personal expenses management system is MySQL. This is because the MySQL provide the structured way to store the data and it can manage the relationships between the tables.

The MySQL is suitable to store the database because it can use the query to easily to retrieve the data in the database and it will be more convenient to the developer to do some operation when it is needed. In order to connect the database with the system, the PHP language is used.

The figure 4.3.1 show that the database of the personal expenses management system. It includes 13 tables in the database. First of all, is the user table, the user table is used to store the username, password and the email address of the user. Besides, the transaction table is used to store the transaction record that added by the user. The category table includes 10 categories that let the user to choose when adding the transaction and the transaction type table include the expenses and income which also help the user's transaction record become more details. Furthermore, the budget sets table is used to store the budget set that created by the users and the budget items table is used to store the categories in the budget set that already allocated amount by the users. Moreover, the joint account table is used to store the joint account that created by the users. In order to let the joint account can be joined by multiple users, the joint account users table is needed. It used to store the members of the joint account. When the users send the invitation to the other users to join the joint account, the invitation table also needed. The invitation table is used to store the status of joining the joint account. If the users are accepting the joint account invitation, then the status will become accepted. If the users are declined the joint account invitation, then the status will become declined. The joint account transaction table is used to store the transaction that added by the users in the joint account. In addition, the budget sets joint table is used to store the budget set that created in the joint account and the budget items joint is used to store the amount of each category in the joint account. Last but not least, the single budget table is used to store the information that provided by the "Belanjawanku 2022-2023" so that it can perform the budget recommendation functions.

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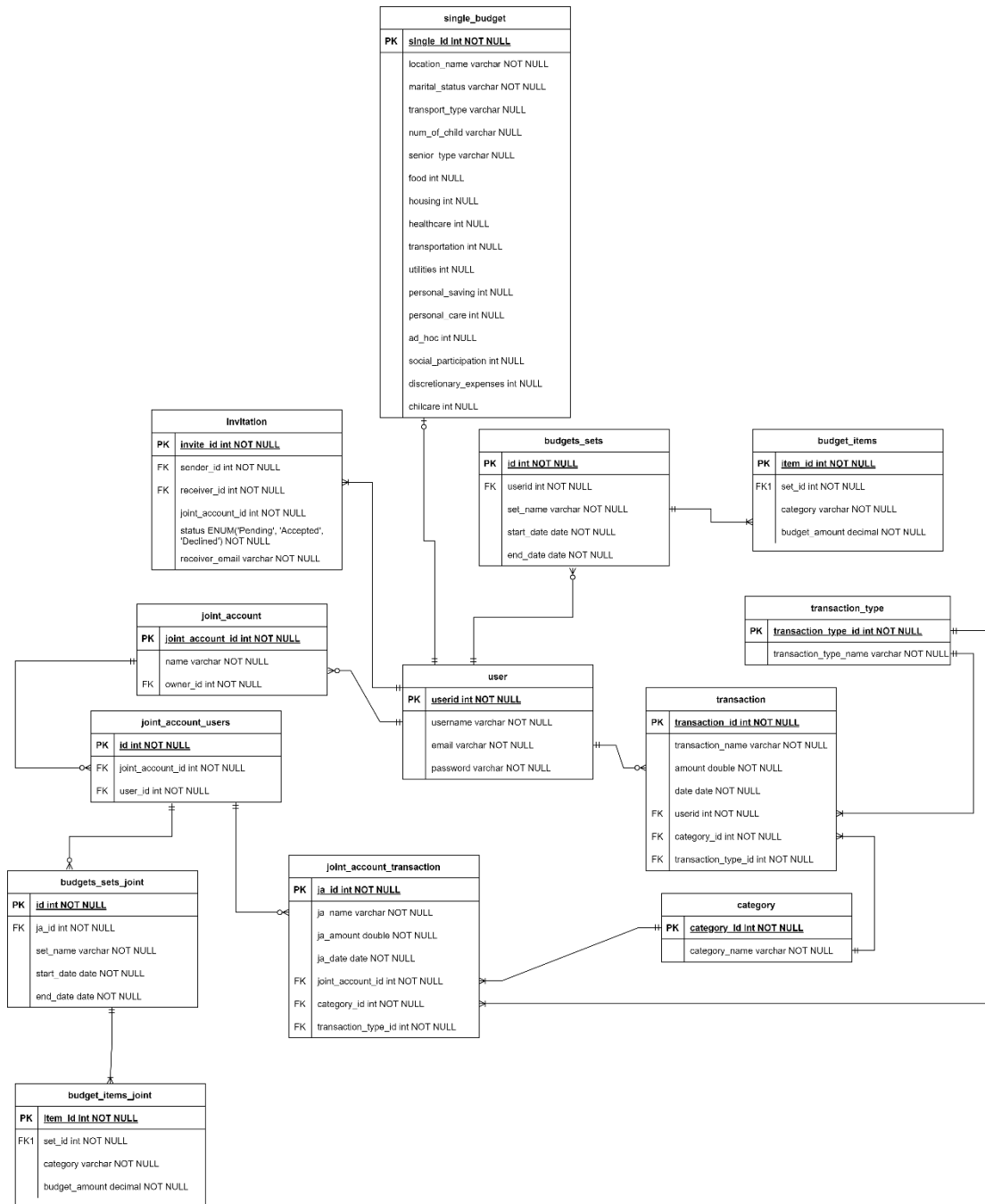


Figure 4.3.1: The database of the personal expenses management system

4.4 Hardware and Software Requirement

4.4.1 Hardware

Table 4.4.1.1: Specifications of Laptop

Description	Specifications
Model	IdeaPad 5 14ALC05
Processor	AMD Ryzen 7 5700U with Radeon Graphics 1.80 GHz
Operating System	Windows 10
Graphic Card	AMD Radeon™ Graphics
Memory	8.00 GB RAM
Storage	475 GB SSD

4.4.2 Software

Table 4.4.2.1: Programming language and tools used in system.

Integrated Development Environment (IDE)	Android Studio
Back-end web development	PHP
Database Management System (DBMS)	XAMPP, phpMyAdmin, MySQL

CHAPTER 5**System Testing**

No	Test Case	Expected Output	Actual Output	Remark
1.	Able to get the budget recommendation based on the answer of the users	Get a budget recommendation in a pie chart form and show the percentage of each category.	Pie chart and the percentages of each category of the budget recommendation show correctly.	PASS
2.	Check the budget set overlapping	If the budget set overlapping, the system will prompt the message to notice the users.	The system checks the date of budget correctly and will show the message if the budget set are overlapping.	PASS
3.	Send invitation to the other users to join the joint account	The invitation is able to send out and check the duplicate sent.	The invitation is sent out successfully and if the invitation send duplicate, the system will notice the users.	PASS
4.	Respond to the invitation	Click the accept button and able to join the joint account.	Users able to join the joint account.	PASS
5.	Functionalities of the joint account	All the users of same joint account able to use of the functionalities without permission.	All of the users are able to use all the functionalities such as add transaction, edit and delete transaction and set budget.	PASS
6.	Disjoint the joint account	The users can disjoint the joint account, if the owner disjoint, then all the users of	The owner and the members able to disjoint the account correctly.	PASS

		the joint account will be kicked out and cannot be used anymore; if the members of the joint account disjoint, then the other member still can use the joint account.		
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Table 5.1: Test Results of the System

The test plan is used to prove the achievement of objectives that has been set at the previous stage. The table 5.1 show the results of the test plan which used to check the functionality of the system.

The first test plan is **testing the budget recommendation function**. The purpose of this test plan is to let the system able to retrieve the correct data from the database by getting the requirements that given by the users. In order to test the budget recommendation, it can be conducted to answer each of the question with different answer so that it can ensure that whatever answer that provide by the user, there are also a recommended budget that can provide to the user. The question is different for different household since it can make the better budget recommendation for the user. The expected output is the after the user answer the question, the system are able to match the data with the database and provide the better budget recommendation to the user in the interface. For example, the figure 5.1 shows the input of the user is to choose the living state, which is Klang Valley, marital status is married couple and do not have a child, then the system will retrieve the data of living state, marital status and number of children and do the matching with the database. After do the matching, the system will provide the budget recommend to the user which allocate the percentage of each category which show in figure 5.2. Then, the users can decide whether to use it as a budget set. If the users decide to use, then it will need to enter the budget name, amount, start date and end date which show in figure 5.3. After the users enter the total amount, the system will allocate the amount for each category so that can utilize the expenses. Then, the users can save the budget save. However, in the figure 5.4, the system is

noticed the users the **date of budget set is overlapping**. Hence, the users need to change the date of the new budget or delete the existing budget before creating the new budget. In the figure 5.5, the users decide to change the date of the new budget and successfully to save the budget.

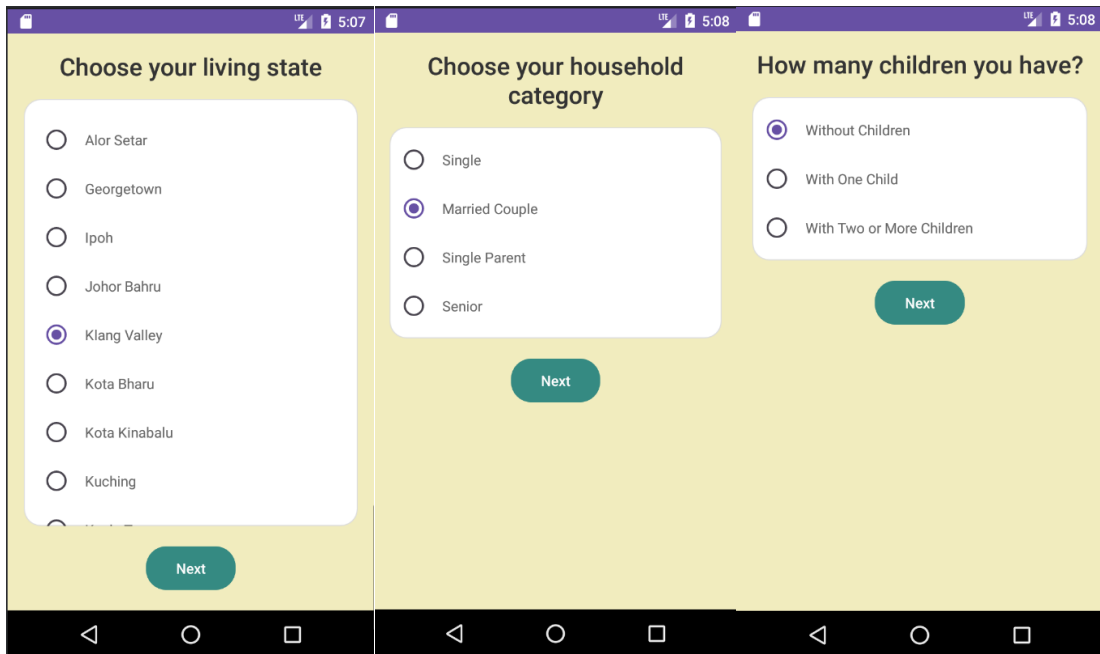


Figure 5.1: Screenshot of the Questionnaire.

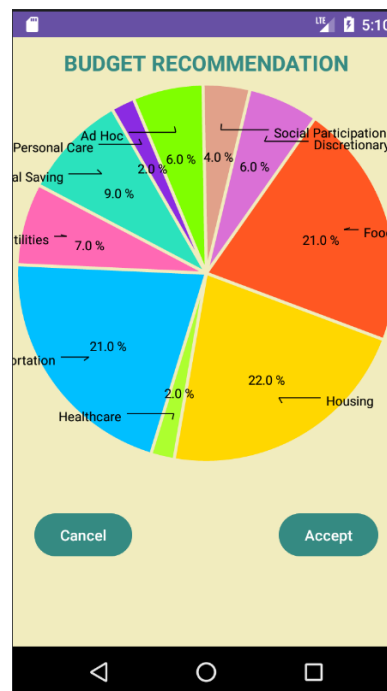


Figure 5.2: Screenshot of the Budget Recommendation.

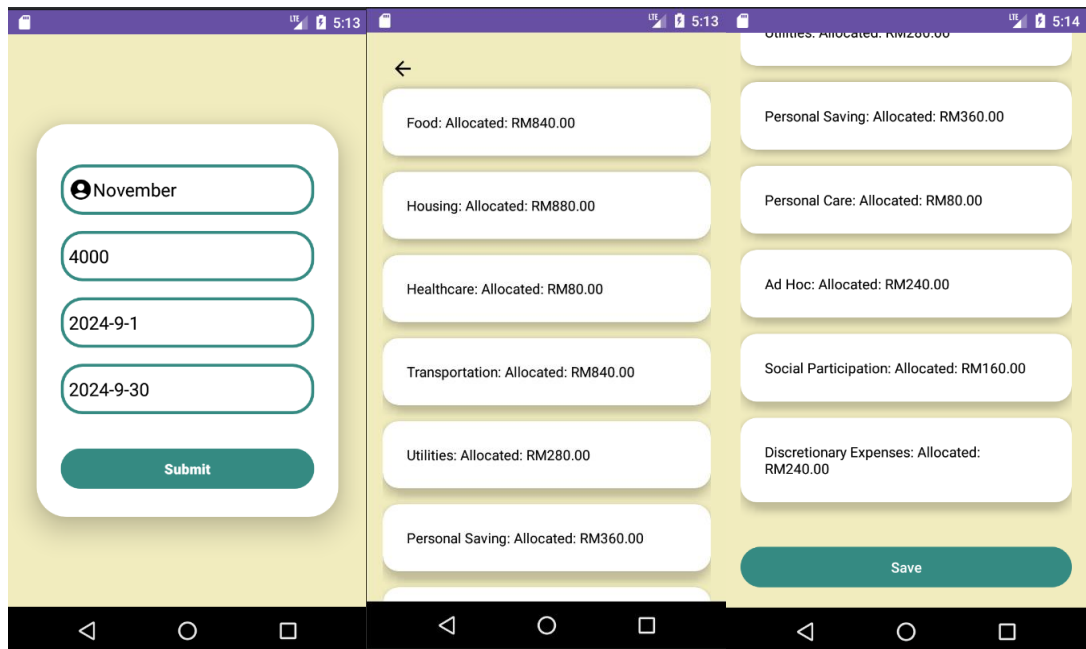


Figure 5.3: Screenshot of the Users Accept to Use the Budget Recommendation.

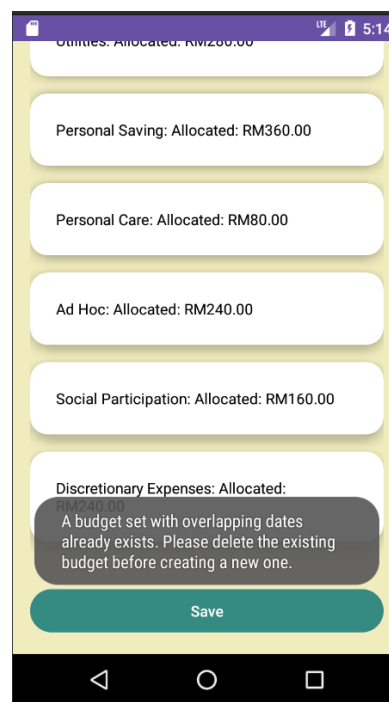


Figure 5.4: Screenshot of the Save Budget.



Figure 5.5: Screenshot of the Success Save Budget.

Besides, the second test plan is to **test the invitation function**. The purpose to test this function is to let the users able to send the invitation to the other users so that they can join the joint account together. After creating the joint account, the users can click the “invite” button to invite the other users to join the joint account which show in the figure 5.6. In the invitation function, the users need to input the email address of the invited user and click the “send” button. In the figure 5.7 show that the system will check the validity of the email address, if the email address does not exist then it will notice the user the users is not found. If the email address exists in the database, then the invitation will send out successfully to the invited user. When the **users duplicate send the invitation to the invited user**, the system will also notice the users that the invitation already sent to the invited users.

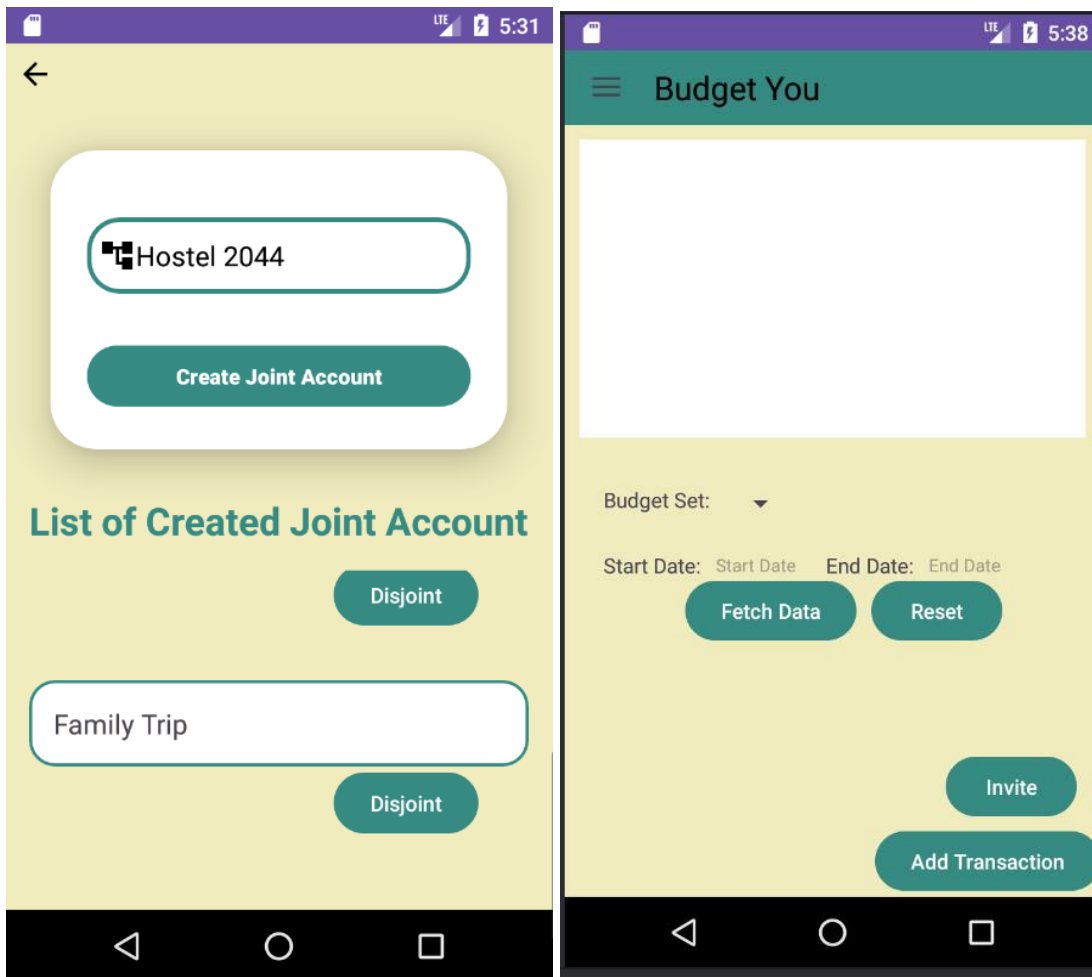


Figure 5.6: Screenshot of the Create Joint Account.

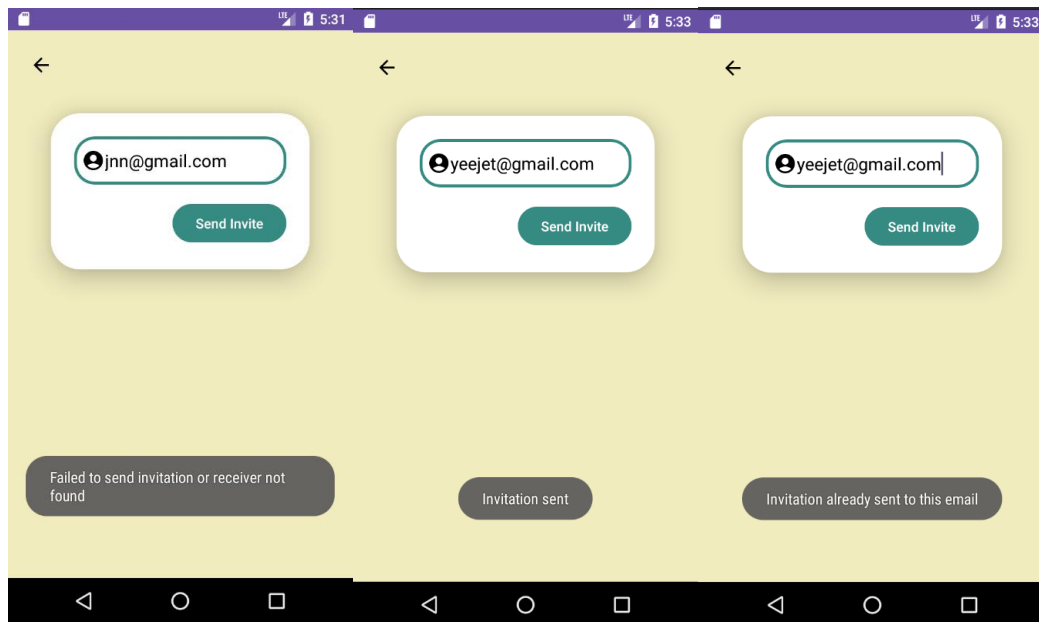


Figure 5.7: Screenshot of the Send Invitation.

Furthermore, the **invitation respond will also be tested**. The purpose of this test is to make sure the invited users are received the invitation and able to respond to the invitation to join the joint account. Since the user is sent the invitation to the email address with “yeejet@gmail.com” then the account of “yeejet” will be login to test the respond invitation function. The invited user can click the notification button from the drawer to view the invitation which show in the figure 5.8. The invitation will be show, it includes the sender information and the name of the joint account. Then, the invited user can make a decision whether to join the joint account. After the users click the “accept” button and join the joint account successfully, the invited user can view the joint account and manage the joint account together with the owner with full right access. The figure 5.9 shows after the users send the invitation to the invited users, the status of the invitation table in the database will be “pending”. If the user accepts the invitation, then the status of the invitation will become “accepted” otherwise the user declines the invitation then status of the invitation will become “declined”.

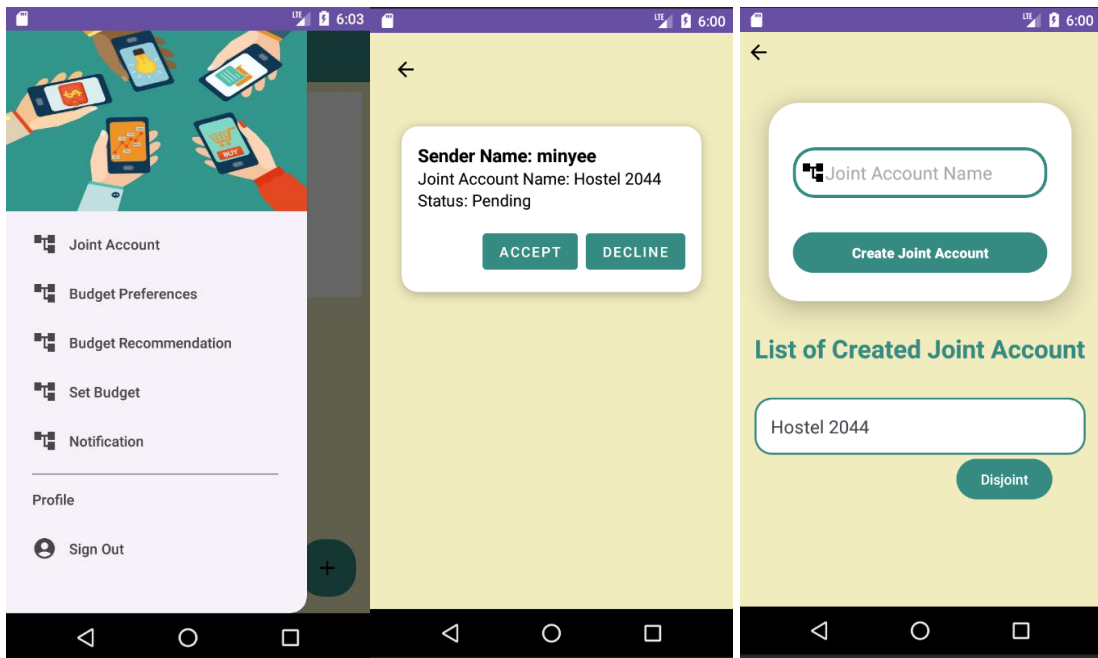


Figure 5.8: Screenshot of the Respond Invitation.

<input type="checkbox"/>	Edit	Copy	Delete	85	187	188	85 Declined	yitong@gmail.com
<input type="checkbox"/>	Edit	Copy	Delete	86	187	188	85 Pending	yitong@gmail.com
<input type="checkbox"/>	Edit	Copy	Delete	88	187	190	86 Accepted	yeejet@gmail.com

Figure 5.9: Screenshot of the Database of the Invitation Status.

Furthermore, the **joint account function will also be test as well**. After the invited users are joining the account successfully, the owner and members of the joint account are able to add the transaction, view the financial report and set the budget as well. In order to test the users can access the account, it can be conduct to login the different account and add the transaction. Then, check the transaction on the main page of the joint account to ensure that the transaction has been added successfully which show in the figure 5.10 and able to store in the database which show in the figure 5.11. Besides, the set budget will also test in the joint account with the same method as well so that the owner and the members of the joint account can see the budget set that created among them.

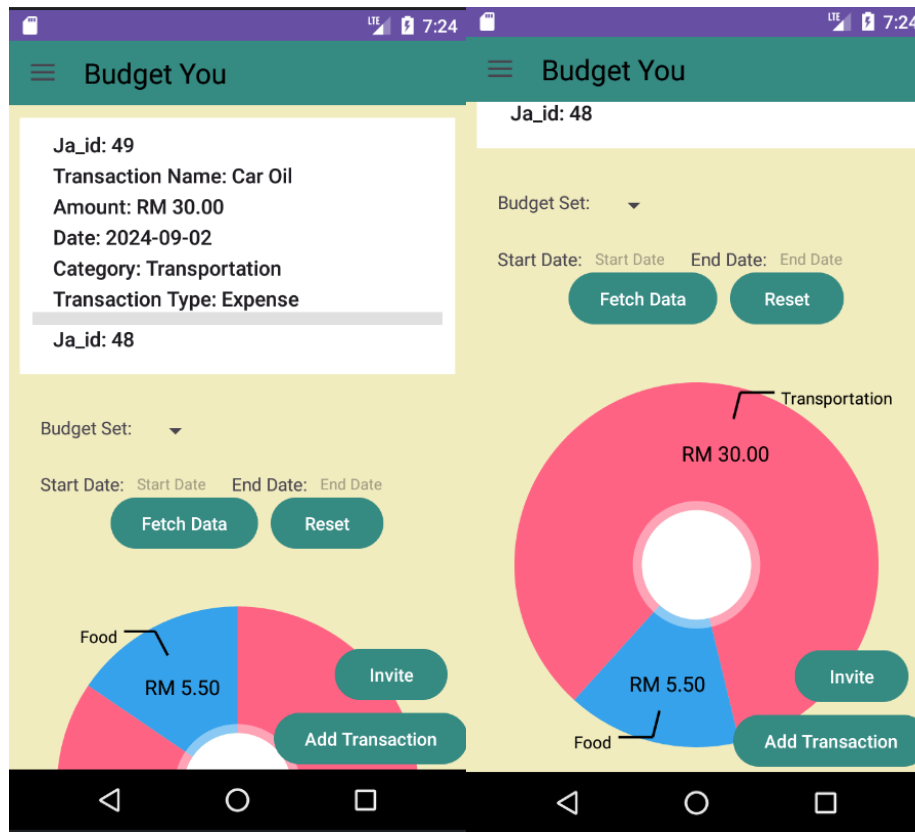


Figure 5.10: Screenshot of the Main Page of the Joint Account.

	ja_id	ja_name	ja_amount	ja_date	joint_account_id	category_id	transaction_type_id
<input type="checkbox"/>	40	Noodles	3.5	2024-08-31	68	1	2
<input type="checkbox"/>	41	Bus	2	2024-08-01	68	4	2
<input type="checkbox"/>	43	Mee Hun	5.5	2024-09-05	68	1	2
<input type="checkbox"/>	44	qqq	11	2024-09-01	68	1	2
<input type="checkbox"/>	46	Ttt	32	2024-09-01	68	1	2
<input type="checkbox"/>	47	noood	6	2024-09-02	84	1	2
<input type="checkbox"/>	48	Pan Mee	5.5	2024-09-04	86	1	2
<input type="checkbox"/>	49	Car Oil	30	2024-09-02	86	4	2

Figure 5.11: Screenshot of the Database of the Joint Account’s Transaction.

Last but not least, the **disjoint function will also be tested**. The purpose of this test is to let the owner and the members of the joint account can disjoint the account when the joint account is does not used anymore. The owner and the members of the joint account can click the “disjoint” button to leave the joint account. When the users click the “disjoint” button, it will prompt out an alert dialog to confirm with the users to disjoint the account which is show in the figure 5.12. If the owner disjoints the joint account, then all the members of the joint account will be leaved the joint account and cannot used the joint account anymore. However, if the members leave the joint account,

then the member will just leave by their own and the joint account is still available for other members and owner to use. Hence, as the figure 5.13 show that there are two members was joint the joint account will the joint account id 86. One of the members want to leave the joint account and confirm to disjoint the joint account. Then, the figure 5.14 and figure 5.15 shows the members after leaving the joint account, the joint account is still available for other users to used. However, in the figure 5.16 and figure 5.17 shows the owner after disjointing the joint account, the joint account is not available in the database and the joint account members will also be disjointed as well.

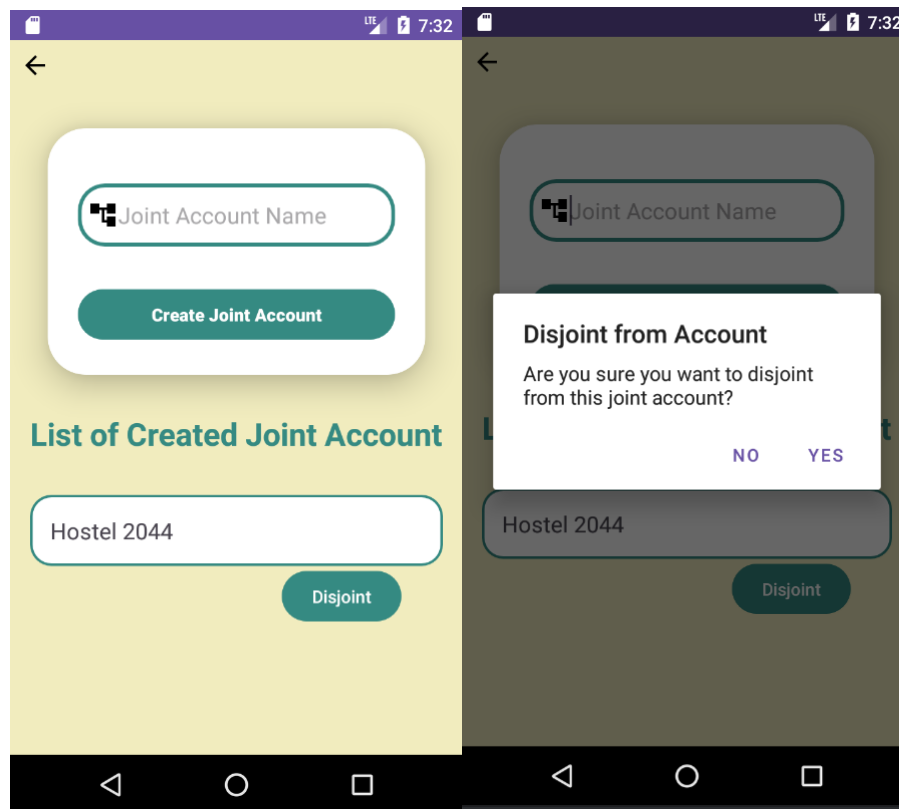


Figure 5.12: Screenshot of the Disjoint Joint Account.

				id	joint_account_id	user_id
<input type="checkbox"/>				5	68	173
<input type="checkbox"/>				15	86	190
<input type="checkbox"/>				16	86	188

Figure 5.13: Screenshot of the User of the Joint Account Before Leave the Joint Account.

				id	joint_account_id	user_id
<input type="checkbox"/>				5	68	173
<input type="checkbox"/>				16	86	188

Figure 5.14: Screenshot of the Members of the Joint Account After Leave the Joint Account.

				joint_account_id	name	owner_id
<input type="checkbox"/>				68	Highland	77
<input type="checkbox"/>				82	feb	77
<input type="checkbox"/>				84	Genting Highlands	187
<input type="checkbox"/>				85	Family Trip	187
<input type="checkbox"/>				86	Hostel 2044	187

Figure 5.15: Screenshot of the Database of the Joint Account before Disjoint.

				joint_account_id	name	owner_id
<input type="checkbox"/>				68	Highland	77
<input type="checkbox"/>				82	feb	77
<input type="checkbox"/>				84	Genting Highlands	187
<input type="checkbox"/>				85	Family Trip	187

Figure 5.16: Screenshot of the Database of the Joint Account after Disjoint by Owner.

				id	joint_account_id	user_id
<input type="checkbox"/>				5	68	173

Figure 5.17: Screenshot of the Database of the Joint Account User after Disjoint by Owner.

CHAPTER 6

System Evaluation and Discussion

6.1 Objectives Evaluation

There are two objectives in these personal expenses management system project, which are perform a joint account function within the multiple individual users and able to give the budget recommendations after answering the questionnaire. Both of the objectives are achieved, the personal management system is **able to let the users to create the joint account and invite multiple users to join in through the email address**. The multiple users are managing the joint account together. They can add the transaction, set the budget, edit and delete the transaction.

The objective of the budget recommendation also been achieved, the users can answer some question so that **the system can analyse the data and retrieve the matching data from the database then perform to the users**. The users still can decide whether to use the budget recommendation. The budget recommendation will help the users who are not well managing their expenses.

6.2 System Limitation

In the personal expenses management system, there are some limitations of the functionality. The first limitation of the system is **the system are not able to fix the budget set**. The users can create a lot of the budget set with different start date and end date. However, the system is not able to let the users to set the budget automatically renew in every month. This means that the users need to create each budget set manually by themselves so that the system can analyse the user's expenses of each month. For example, the users create a budget set called "January", then set the start date in 1st of January, set the end date in 31st of January and allocate the amount of each category. The budget set will create successfully, and the users can click the budget set to view their expenses whether is overspending. If the users need to have the budget set of February, then the users need to create the budget set again by themselves. The system will not automatically renew for the next month.

The second limitation of the application is **the system will not send the notification to the users when their expenses are overspending**. The budget set is used for helping the users to prevent the overspending in the expenses since the users

were allocate the amount for each category when create the budget set. The budget set are able to let the users to calculate the user's expenses and view the remaining amount of each category. If the remaining money is zero or become negative, the system will not be able to send the notification to the users to aware them.

On the other hand, the limitation of the system is **the system does not provide the symbol at the notification to inform the users to know there is a new notification has been received**. Hence, the users need to check the notification regularly so that the users would not miss any invitation from the other users. This lack of the visual cues can be inconvenient for the users especially if the users are the person who not regularly check the notification.

Moreover, the system also **does not able to let the user to customize the category**. The users only can use the category that provide by the system. The users cannot be added, edit or delete the category based on their needs. Not only that, but the system also **does not provide the subcategories for the users**. The users only can choose the main categories to record their transactions. In order to let the transaction can be recorded in more detail, the users can only write the details in the part of the transaction name instead of clicking the subcategory.

Besides, the limitation of the system is the **category in the budget set cannot be edited**. When the users need to change the amount of the category in the budget set, the users need to delete the budget sets and create a new budget set. This will make the users become inconvenient and trouble.

Furthermore, the limitation of the system is **it does not provide the account connected to the bank**. This is because the connection to the bank is not very important to the user. The security problem will occur when the system is connected to the user's bank account which means that if the hacker wants to hack the user's bank account, they can hack the system and indirectly get the bank account's information. Therefore, it has a certain risk to develop the system connected to the bank.

Last but not least, the limitation of the system is **the system cannot convert the currency following the real-time currency and the main currency of the system is fix to Malaysia Ringgit**. This is because currency will always change based on the economics of the country. Hence, it is difficult to have a fixed currency to convert the amount to other foreign currency.

6.3 Future Enhancement/Improvement

In order to make the system become more effective and more convenience, there are some future enhancements are suggested. The first enhancement is the **system can be able to renew the budget set automatically in every month without user set manually**. The system can detect the end date of the current budget set and automatically to trigger the renewal process so that the budget set can be renew in every month. This can let the users save the time to create another budget set with the same components. Before the budget set is renewed, the system can send a set of results of the current budget set to the users by the email. This can let the users to view the transaction record of the current monthly and do some analysis if needed. Hence, the users do not need to scare that if the budget renew every month, then the record will be overridden or disappear. The system can also have a notification to the users before one day the budget set renew. This can let the users to aware about it.

Besides, the other improvement of the system is **the system can provide a toggle switch label “Automatically Renew” to let the users to decide whether to renew the budget set automatically**. This is because some of the users may set the budget just for to achieve some specific goal such as buy the birthday gift and so on. Hence, the users can decide based on their needs. If the users choose to automatically renew the budget, the system can also provide the users to decide the range of month to renew the budget. For example, if the users need the budget set automatically renew for 12 months, then the users can input the months so that the system will maintain renew automatically for 12 months. The users can also just decide for renew automatically without the range of month; this will let the system to renew the budget set in every month until the users change it.

Furthermore, the joint account of the system can also have an improvement on it. The system can **show the owner and the members who joined the joint account** in the setting section so that the users of the joint account can know who are in the joint account. The system can also **display the username of the user in each transaction record** when the user of the joint account is recorded the transaction. This can let all the users in the joint account have a clear information that who are spending the expenses. This also will help the users to track the spending and increase the user satisfaction.

In addition, the system can provide the **function of customize the category**. This function can let the users to customize their categories based on their preferences so that the users will have a better experience when using the system. The system can also be **adding in the subcategory** so that the users can record the transaction in more details and easy to understand.

Moreover, the enhancement can make for the system can **provide a symbol for the notification in the status bar such as an exclamation mark with the red colour** so that the users will aware that there is a new notification for them. The system can also include the small counters in order to show the number of unread messages the users have not seen yet. Not only this, but the system can also have a pop-up reminder about the unread notifications to remind the users when every time the users login to the system.

Last but not least, **the transaction id of the personal account and the joint account can be removed as well** so that this will not make the user curious about the use of the id since the transaction id is not useful on their view. In the current version, the transaction id of the personal account and the joint account is let the users able to edit the transaction and delete the transaction from the database. Hence, the system can be improved without display the transaction id to the users.

Conclusion

Nowadays, the people like to use the mobile to done anything since it was convenient and it save the time of the people. Thus, the personal expenses management system is a system that available in the mobile and able to let the user to record their daily transactions in their mobile app. Hence, the users do not need to record the transaction on paper or use the Microsoft Excel to record it. This will bring a lot of convenient for the user, the user can record the transaction in anywhere and anytime so that the user would not miss out any transaction. In this new system, it provides the budget recommend system and the joint account for the user. The budget recommend function will suggest the budget to the user based on their information and the joint account function will be able to let multiple users to manage the account together with the full functionality that same as the main user.

However, most of the existing system that are not able to provide these two functions. In the existing system, it will not provide any budget recommendation for the user. The budget recommend function can be a guideline for the newbie of the personal expenses management system. For example, when the users are lost the direction in planning the finance, then this function are very suitable for the users. Hence, it is an important function to lead the user to have a financial planning in their life. Besides, the existing system also lack the joint account function. Most of the existing system only have the share wallet function, it is different from the joint account function. The share wallet function can invite the other user however, the invited user only can do some limited function such as add transaction, but they cannot customize the category in the share wallet. In the joint account function, once the invited user is joining the joint account, then the invited user will have the full right to do anything in the account such as set budget, add transaction, customize the category and others. Therefore, the new system is provided the new functionality to bring the convenient for the users and help them in financial planning.

Through develop the project, various challenges are encountered, including the complexity of the database, unfamiliar language used to develop the system, the logic used in the project and so on. However, the challenges are be solved and still can make enhancement in the future.

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FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S1	Study week no.: 2
Student Name & ID: TAN MIN YEE 21ACB02549	
Supervisor: Ts Dr Ku Chin Soon	
Project Title: Personal Expenses Management System	

1. WORK DONE

- Revised the FYP1 by last semester.
- Continue the module development.

2. WORK TO BE DONE


- Enhance the joint account function with the complete version.

3. PROBLEMS ENCOUNTERED


- No.

4. SELF EVALUATION OF THE PROGRESS

- Everything is on the process.



Supervisor's signature



Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S1	Study week no.: 4
Student Name & ID: TAN MIN YEE 21ACB02549	
Supervisor: Ts Dr Ku Chin Soon	
Project Title: Personal Expenses Management System	

1. WORK DONE

- The function of joint account is done. Able to receive the invitation to join the joint account.
- The existing system review has been done.
- Chapter 1 is completed.

2. WORK TO BE DONE


- Enhance the system diagram and activity diagram so that have a better understanding on the system.
- Enhance the budget recommendation module.

3. PROBLEMS ENCOUNTERED

- No.

4. SELF EVALUATION OF THE PROGRESS

- Everything is on the process.



Supervisor's signature



Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S1	Study week no.: 6
Student Name & ID: TAN MIN YEE 21ACB02549	
Supervisor: Ts Dr Ku Chin Soon	
Project Title: Personal Expenses Management System	

1. WORK DONE

- The system diagrams and the activity diagram has been done.
- Budget recommendation module is done.

2. WORK TO BE DONE


- Chapter 3 is still on going.
- Improve the server architecture and the updated timeline of the project will be done.
- Make the budget set module.

3. PROBLEMS ENCOUNTERED

- No

4. SELF EVALUATION OF THE PROGRESS

- Everything is on the process.



Supervisor's signature



Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S1	Study week no.: 8
Student Name & ID: TAN MIN YEE 21ACB02549	
Supervisor: Ts Dr Ku Chin Soon	
Project Title: Personal Expenses Management System	

1. WORK DONE

- Budget Set module is done.

2. WORK TO BE DONE


- Make the joint account can perform the budget set, edit transaction.

3. PROBLEMS ENCOUNTERED

- No

4. SELF EVALUATION OF THE PROGRESS

- Everything is on the process.



Supervisor's signature



Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S1	Study week no.: 10
Student Name & ID: TAN MIN YEE 21ACB02549	
Supervisor: Ts Dr Ku Chin Soon	
Project Title: Personal Expenses Management System	

1. WORK DONE

- Joint account able to add the transaction, edit transaction, delete transaction and set the budget.

2. WORK TO BE DONE


- Integrate all the functionalities and test the functionality.

3. PROBLEMS ENCOUNTERED

- Slow progress and need to spend more time on coding.

4. SELF EVALUATION OF THE PROGRESS

- Poor time management and cause the progress is slow.
- Need to manage the stress well.



Supervisor's signature



Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Y3S1	Study week no.: 12
Student Name & ID: TAN MIN YEE 21ACB02549	
Supervisor: Ts Dr Ku Chin Soon	
Project Title: Personal Expenses Management System	

1. WORK DONE

- The system is completed.

2. WORK TO BE DONE

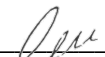
- Finalise the report and prepare for submission.

3. PROBLEMS ENCOUNTERED

- Need put more effort on implement the function.

3. SELF EVALUATION OF THE PROGRESS

- Need to manage the stress well.



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Student's signature

POSTER

UTAR
UNIVERSITI TUNKU ABDUL RAHMAN

**FACULTY OF INFORMATION
COMMUNICATION AND TECHNOLOGY**

PERSONAL EXPENSES MANAGEMENT SYSTEM

INTRODUCTION
To develop a mobile-based system of personal expenses management system that able to let the user to record their daily transaction.

PROBLEM STATEMENT

- Do not support Joint Account Function
- Lack of Budget Recommendation

OBJECTIVES

- Able to perform a joint account within multiple individual users
- Develop a budget recommendation function that able to give budget suggestion to the users

CONCLUSION
User able to have joint account with multiple user and the budget recommendation is provided for the newbie as a guide.

PROJECT DEVELOPER: TAN MIN YEE
PROJECT SUPERVISOR: TS DR KU CHIN SOON

PLAGIARISM CHECK RESULT

PLAGIARISM CHECK RESULT

Turnitin Originality Report

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FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY

Full Name(s) of Candidate(s)	TAN MIN YEE
ID Number(s)	21ACB02549
Programme / Course	BACHELOR OF INFORMATION SYSTEMS (HONOURS) INFORMATION SYSTEMS ENGINEERING
Title of Final Year Project	PERSONAL EXPENSES MANAGEMENT SYSTEM

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Signature of Supervisor

Name: Ku Chin Soon

Signature of Co-Supervisor

Name: _____

PLAGIARISM CHECK RESULT

Date: 12/09/2024

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