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Enhancing Financial Literacy: A Progressive Web Application Approach for Malaysian Youth

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Abstract - Financial management is a crucial skill that individuals of all age ranges should acquire and master. It offers a transparent view of our financial status, enabling us to comprehend where our expenses are directed and manage every facet of our finances. Studies have indicated that Malaysian youth lack understanding in financial management. Nowadays, with so many people using the internet, we have the opportunity to share this expertise with a larger audience. Providing easily accessible materials for learning about and managing personal finances is essential to comprehending people's individual financial circumstances. In light of this, the purpose of this article is to develop a useful, progressive web system for personal finance management that makes budgeting and cost tracking easier. This personal finance management system will be implemented using the Tailwind Cascading Style Sheets, Firebase, and React framework as development tools. React frameworks are used due to their ability to produce dynamic user interfaces. To sum up, this user-friendly interface mechanism enables the formulation of budgets and the tracking of expenses. It also consists of other features for data visualization, such as charts. This research has the potential to add some additional enhancements to its existing functionality. For instance, it could introduce a predictive budgeting function that uses historical user spending data to perform predictive analysis.

Keywords— *Progressive Web Mechanism, Financial Management, Personal Finance Management, Budget Creation, Productivity and Usability*

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1. INTRODUCTION

Mastering financial management is an essential skill for individuals of all ages to achieve financial security and lead a life free from financial stress. The current advancements in technology offer us a valuable opportunity to track and strategize our expenditures. It makes not only the process of financial management more efficient, but also aids in making more intelligent financial decisions. Between 2010 and 2015, out of 101,537 Malaysians declared bankrupt, 53% were individuals under the age of 40 [1]. This highlights the significance of equipping individuals, particularly the younger generation, with essential tools for effective financial management, which could potentially lower the risk of bankruptcy. A possible approach that could be done to solve this issue is letting people practise and enhance the financial management skills through web applications. Web applications today are easily accessible at any time and from anywhere. They simplify complex tasks and provide real-time tracking to the people. Financial

engineering plays a crucial role by developing innovative solutions to empower individuals and organizations to make informed decisions about their finances [2].

In the domain of financial literacy, numerous web applications fall short in terms of effective data visualization and user-friendly interfaces. Existing platforms often lack clear visualizations, making it challenging for users to grasp complex financial concepts. Typically, this deficiency arises from the absence of clear charts, graphs, or interactive displays. Furthermore, current web applications suffer from complicated interface designs, including improper categorization. As a result, users find it difficult to navigate and understand how to use these tools.

Thus, a progressive web mechanism which can be used to create budget, track expenses, and analysis is introduced. This mechanism is utilised to log expenditures, perform real-time analysis, and consequently provide an up-to-date overview of the user's financial status. It will provide insight to our spending pattern and make the user more cautious on tier expenses.

The primary objective of this research is to design a web mechanism with a user-friendly interface that enables users to formulate and document their budgets. Furthermore, the research aims to develop a web mechanism capable of providing a category analysis derived from the user's expenditures. In the end, the research aims to provide a straightforward and clear visualisation for the user by representing data through a chart. This involves a web application developed by using React Framework, Tailwind CSS and Java Script. React is an open-source JavaScript library used to build user interfaces (UI). The mechanism will offer a range of features including budgeting, expense tracking and analysis.

2. BACKGROUND STUDY

2.1. Personal Financial Management Overview

The idea of personal financial management is started by Scott Cook, the co-founder of Intuit. Intuit created Quicken, the first personal financial management system, and strategist [3]. Quicken was created for a mini function to replicate the paper check, making it user friendly for anyone who had to pay a bill via checks. As the internet developed, personal financial management underwent a fundamental transformation and surpassed its initial scope by enhancing its features. By integrating with the internet, it became available to everyone and facilitated their financial choices.

Personal financial management systems can be used by all ages from teenagers to students to elderly. However, not many people always have the personal financial knowledge to manage their finances. Research indicates that nearly all college students are interested in acquiring knowledge about financial management [4]. College students are forced to manage their money independently although they are assumed to not have minimal financial affairs knowledge as financial education is not taught in school [5].

2.2. Budget

Budgeting serves as a potent instrument for formulating a structured strategy on youth monetary expenditure [6]. It empowers one to make lucid and appropriate financial choices. Individuals can evaluate if a particular category of expenses is genuinely beneficial for them or not. Is it their current primary area of interest for spending? By implementing this, individuals can accumulate a significant amount of money in their bank account by avoiding unnecessary expenditures [7].

Contemporary personal financial management systems invariably offer budgeting tools that allow users to classify and monitor their expenditures, as supported by Ashta and Herrmann [8]. Leveraging current technology, users have the convenience to effortlessly amend, review, and update their budget by category at any time and from any location [9]. This ease of access enables users to readily achieve their financial objectives, such as settling debts, saving for significant future purchases, and more.

There are five steps to create a budget according to CNBC [9], which include calculate the net income, list the monthly expenses, label fixed and variable expenses, determine average monthly cost for each expenses, plus make adjustments. The initial step involves determining the net income, which is computed by subtracting taxes and other

deductions from the total income. Essentially, this is the amount you have left to expend. Subsequently, you should enumerate all the potential expenses for a month, encompassing everything from food, living costs, to entertainment, and more. Following that, you should categorise your expenses into fixed and variable. Fixed expenses might include items like phone bills and instalments, while variable expenses could encompass entertainment and dining out. Next, you can discern your spending habits by calculating the average monthly cost for each category of expenses. The last phase entails adjusting as needed. Reduce your variable expenses if your out-of-pocket costs are more than your overall income.

2.3. Budgeting Methods

As a matter of fact, budgeting techniques are highly customizable and frequently based on personal tastes. Now let's explore these budgeting techniques. Senator Elizabeth Warren of the United States developed the 50/30/20 rule strategy in an effort to instil financial responsibility in her children. The approach, which is still in use today, has a focus on balance and allocates 50% of income for needs, 30% for wants, and 20% for debt repayment or savings. The fifty percent allotted to needs includes rent, food, insurance, and medical costs. All the necessary bills and essentials for daily life fall under this category. Afterwards, the desires are limited to thirty percent. Although these costs increase your level of enjoyment, they do not immediately affect your job or health. This could include gifts, hobbies, and shopping. Finally, 20% of your net income should be directed towards savings or debt repayment. This is crucial for making progress towards your financial goals and can be used as an emergency fund.

Next, the envelope system approach uses cash to help one to limit spending in a specific category without monitoring every cost. One just needs to assign a budget for each category and put that amount of cash in an envelope labelled with that category. When the envelope runs out of cash, one would stop spending in that category for the month. Cash makes us more aware of how much we spend compared to a digital number in our bank account, because we value physical things more.

Furthermore, zero-based budgeting (ZBB) is a budgeting technique that Peter Phyr, an accountant and consultant, created in the 1970s. This method makes the income and expenses balance to zero. This encourages one to explain every cost from the beginning. One can manage every Ringgit or Dollar one makes. Nevertheless, there are some key things to know. Applying this will need time and work because one needs to track each cost to stay on budget, as observed by Bartocci et al. [10].

2.4. Existing Systems

We explore three existing online personal financial management systems that helped to make budget and record expenses in this section. Each system has features like creating a budget, view category expenses analysis and filter by month. The applications being discussed are YNAB (You Need A Budget), Everydollar and GoodBudget. Figure 1 shows the budget dashboard of YNAB approach. The dashboard page uses colours for line graph sampling. This approach contrasts well on-screen amount and on-black-and-white transactions displayed in the YNAB system.

Bergmann et al. observed that budgeting is directing the money to an individual's goals instead of wondering what one spent it [11]. In YNAB, the budget is grouped into categories in a hierarchical manner. Each group has subgroups, allowing for a detailed and organised breakdown of budget items. Users can assign specific budgets to each subgroup within the hierarchical structure. Users can view the budget for each subgroup along with the available balance. Different colours are used to highlight the balance status of subgroups. If there is insufficient budget in a subgroup, it is highlighted in yellow. If there is enough budget for the subgroup, it is highlighted in green. Users can add category groups. Customization of group names is allowed, providing flexibility in structuring the budget according to individual preferences and needs.

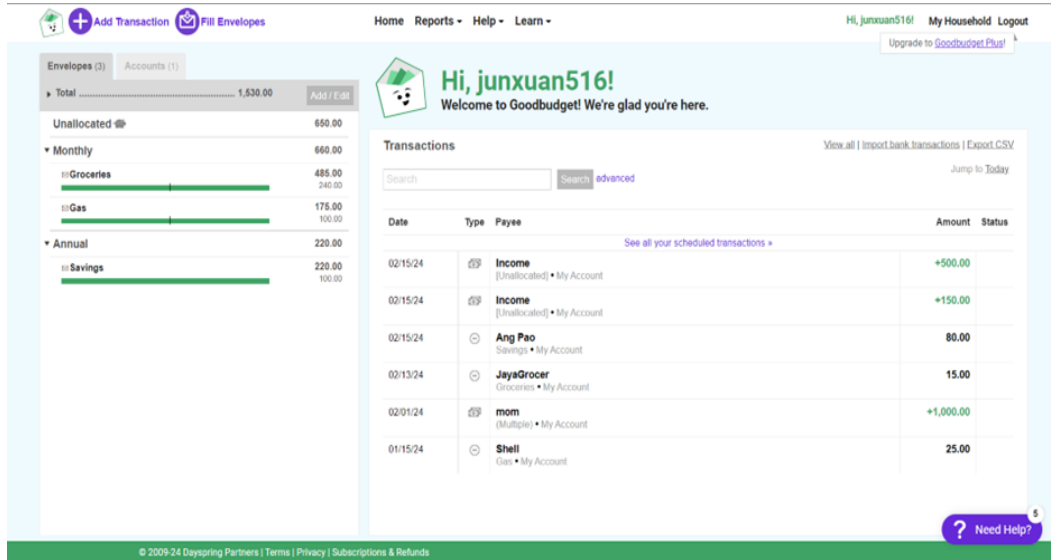


Figure 1. YNAB Dashboard Approach

Figure 2 illustrates the EveryDollar’s budget page. To ensure one is on budget, one always have to record every expense, as proposed by Simon Aagaard Pedersen et al. [12]. It consists of two main parts: income and expenses. Users can input a planned balance for each income and expense item. Expenses are categorised into different budget categories. When adding expenses, users can choose the specific budget category to which the expense belongs. As users add expenses, the remaining balance in the chosen budget category is automatically updated. The ability to manually add expenses and allocate them to specific budget categories provides users with flexibility and control over their budgeting process.

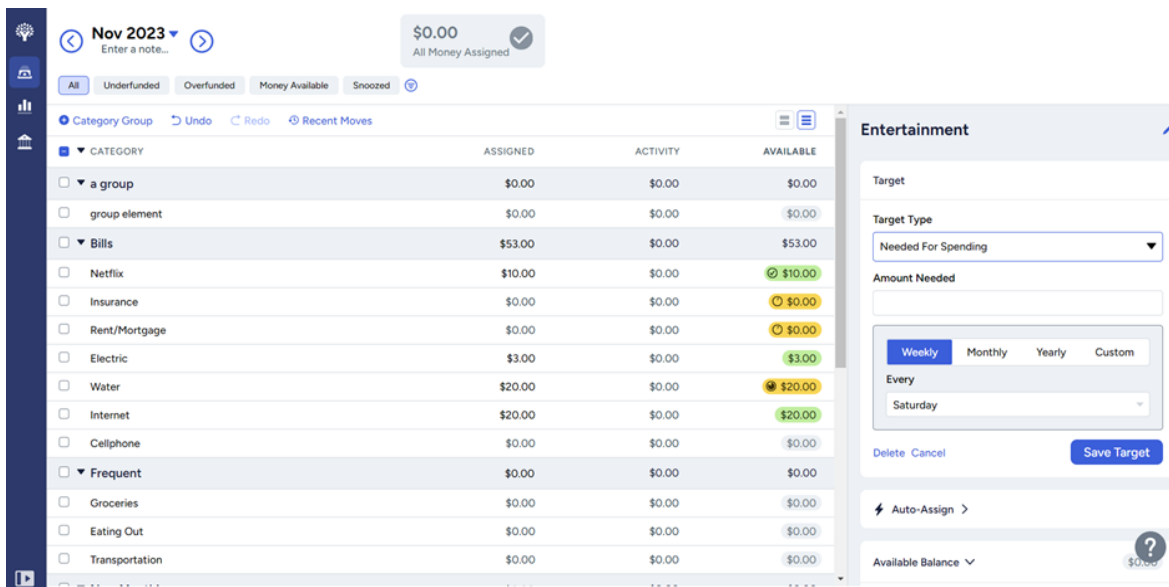


Figure 2. EveryDollar’s Budget Page

Figure 3 illustrates the interface of the GoodBudget application approach. This app employs an envelope system to monitor expenditures and manage the budget, proposed by Barroy et al. [13]. The left side of the interface presents a concise overview of the remaining budget in various categories such as groceries, gas, and savings, offering users a quick glimpse of their financial situation. The right side of the interface displays the history of transactions, aiding users in tracking their spending and pinpointing areas for potential savings or modifications.

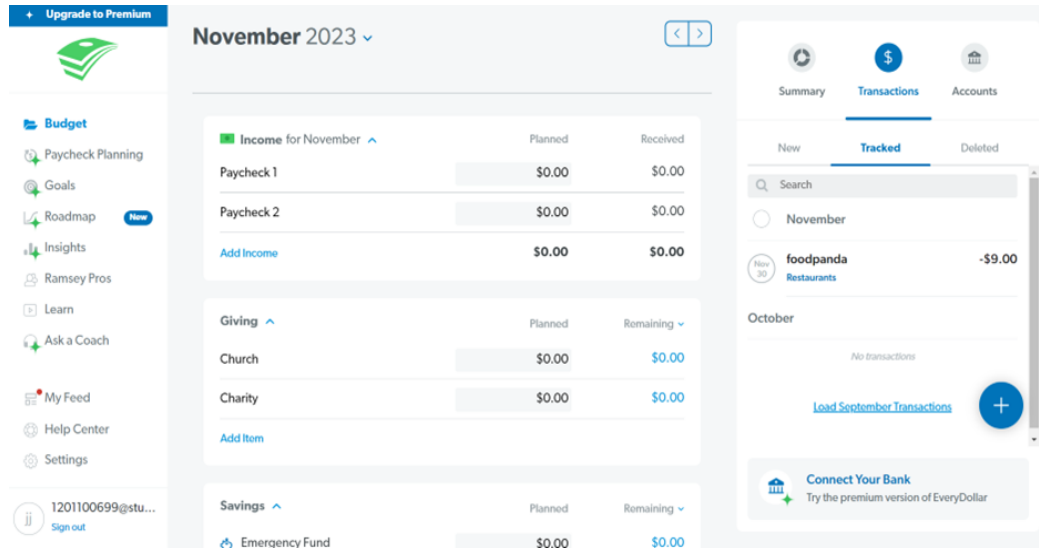


Figure 3. GoodBudget’s Insight Page

2.5. Comparing System with Existing System

Table 1 shows there are several enhancements over the existing online systems. The proposed system incorporates the similar features as other existing systems, such as creating a budget, recording expenses, filtering expense records by month, adding new budget categories, and performing category analysis. Additionally, the proposed system introduces a daily expenses feature, providing users with a more convenient, direct view of their spending.

Table 1. Comparison Between Existing System and Proposed System

Functions or Materials	Existing System			Proposed System
	YNAB	Everydollar	GoodBudget	
Budget	Y	Y	Y	Y
Record expenses	N	Y	Y	Y
Budget categories	Y	Y	N	Y
Daily expense chart	N	N	N	Y
Category analysis	Y	Y	N	Y
Filter by month	Y	Y	Y	Y

3. RESEARCH METHODOLOGY

For the conceptual representation, Figure 4 depicts the use case diagram for the Personal Financial Management Application (PFMA). Initially, the system offers a login function, allowing users to access their unique accounts. For those who are new, they have the option to register a fresh account.

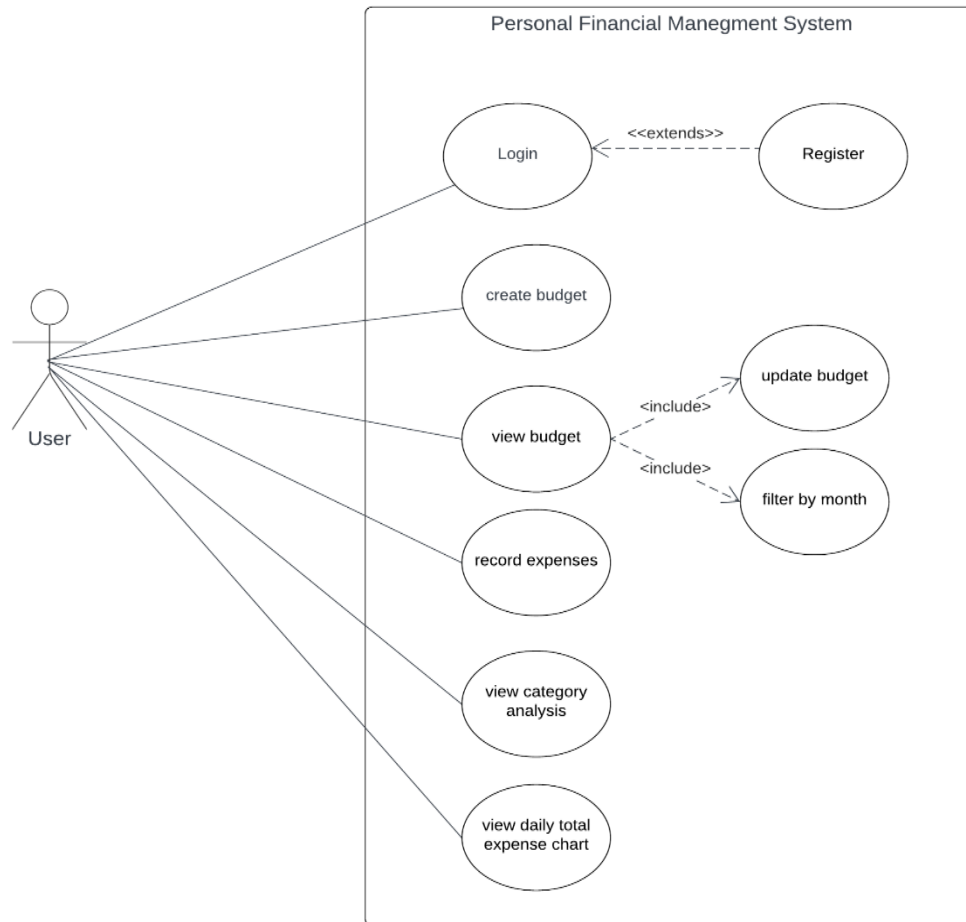


Figure 4. Use Case Diagram of Personal Financial Management Application (PFMA)

Subsequently, users can establish a new budget or budget categories. They can then observe the amount of budget they have spent and what remains. Users are given the choice to modify their budget such as changing categories name and update amount. They can also view their budget filtered by month. Following this, users can document expenses, which will be displayed in a list format. They can view a category analysis, showing where the majority of their money is spent, represented in percentages. Ultimately, users can view a daily total expense chart, providing a clear and direct visualisation of their spending habits.

Figure 5 represents the context diagram of the Personal Financial Management Application (PFMA). Context diagram, also known as Data Flow Diagram (Level 0), is a high-level view of a system that maps out the interactions of entity with the system. The primary actor in this system is the user, who interacts with the system to create budget, record expenses, view expense records, and analyse their spending patterns.

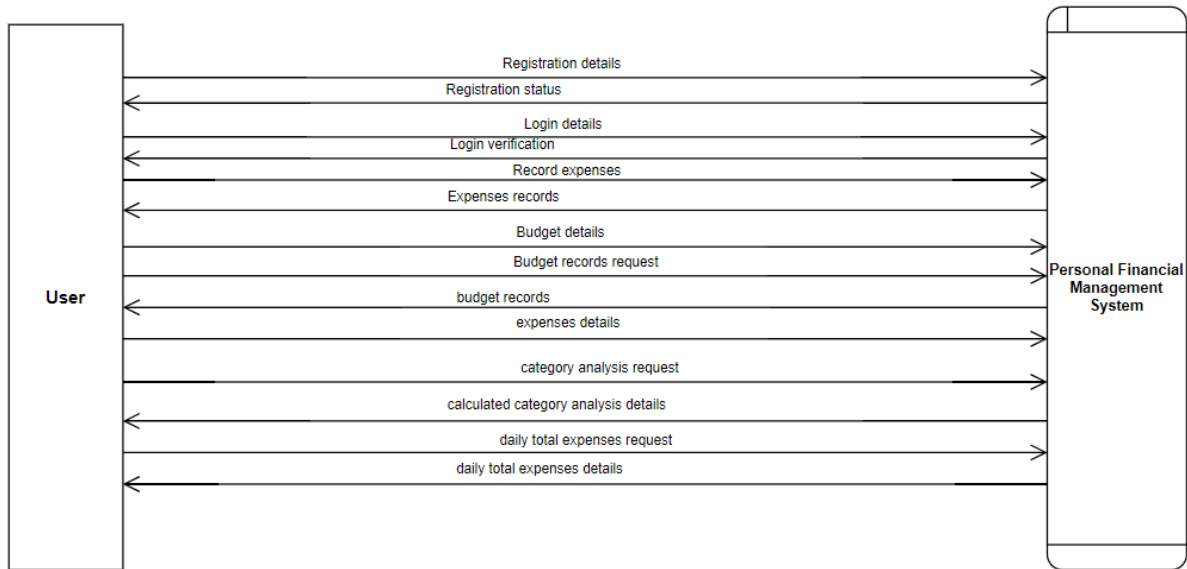


Figure 5. Context Diagram of Personal Financial Management Application (PFMA)

There are several key functionalities available to users. Firstly, users can check their registration status and provide login details to access the system. Once logged in, they can record their expenses and view their expense records. One important feature is the ability to retrieve budget details and request budget records, which allows them to have a comprehensive view of their financial status.

Another significant functionality is the category analysis. Users can make a category analysis request to receive calculated category analysis details, aiding in understanding their spending patterns. This information can be valuable in planning their budget and managing their expenses. Finally, users also have the option to request daily total expenses. This feature allows them to view daily total expenses details for meticulous financial tracking. The system then provides these details, enabling users to track changes over time.

Figure 6 represents the data flow diagram of the Personal Financial Management Application (PFMA). The system consists of six primary processes which are register account, login account, create Budget, record expenses, and view category analysis. First in the register account process, users provide their details to create an account; upon successful registration, a confirmation is sent back to them. After that, is the login account process. It involves users entering their login details; the system verifies these details and confirms successful login.

Once logged in, users can create a budget through the create budget process, where they input budget details into the system. These details are then stored for future reference. The record expenses process allows users to enter expense details that are stored by the system for analysis and tracking.

Lastly, in the view category analysis process, users request an analysis of their expenses by category. The system retrieves this data and presents it visually, aiding in understanding their spending patterns. This information can be valuable in planning their budget and managing their expenses.

4. RESULTS AND DISCUSSIONS

4.1 Systematic and Organised Data Perspective

Figure 7 represents the Entity Relationship Diagram (ERD) for the system. The ERD consists of three entities: user, budget, and expenses. The User entity contains four fields: user_id (primary key), username, password, and email. The User entity has relationships with both the Budget and Expenses entities.

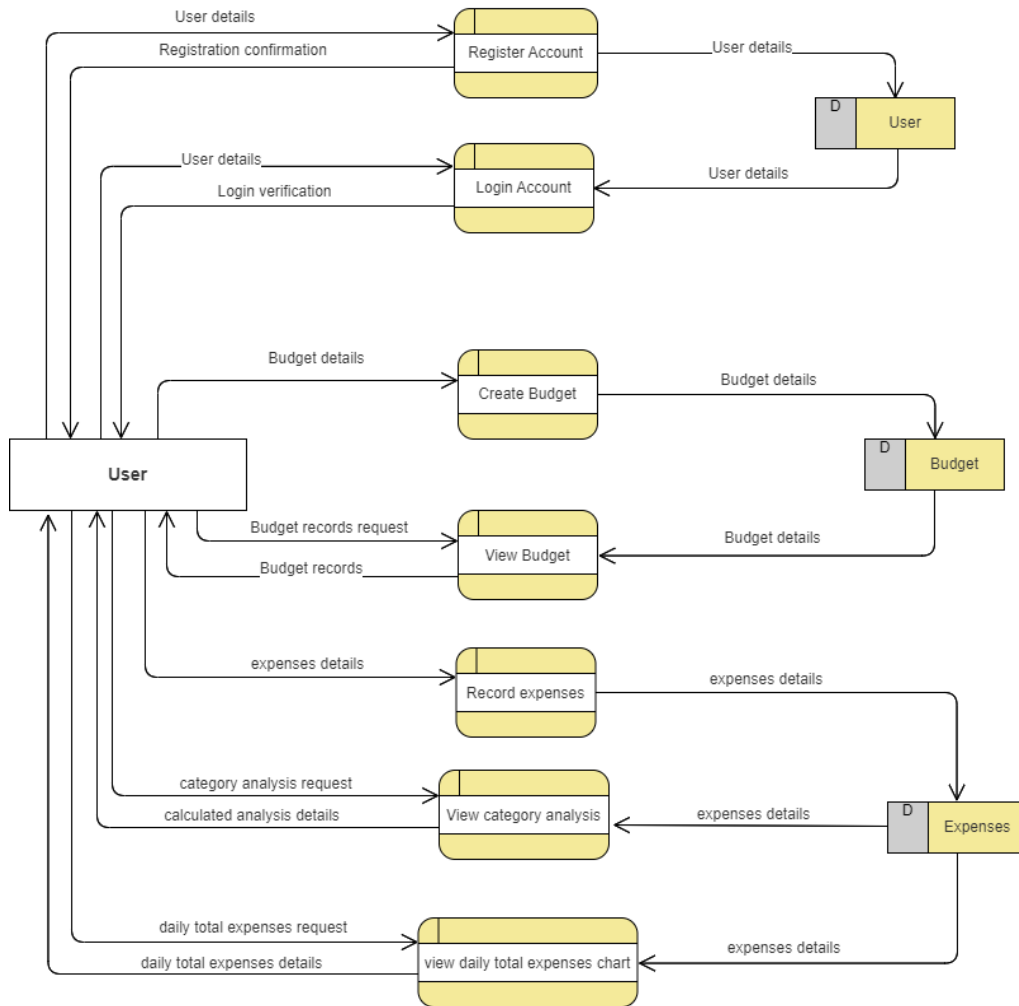


Figure 6. Level 1 Data Flow Diagram of Personal Financial Management Application (PFMA)

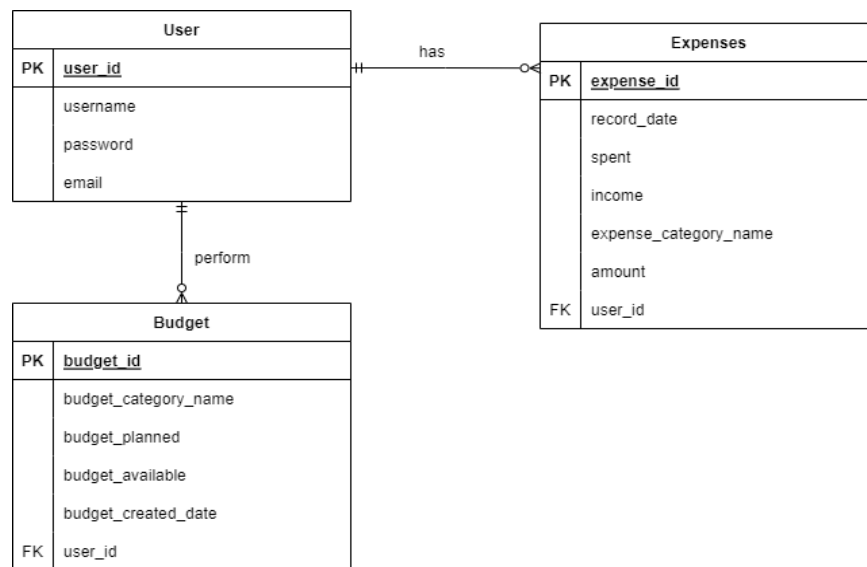


Figure 7. Entity Relationship Diagram of Personal Financial Management Application (PFMA)

The Budget entity contains six fields: budget_id (primary key), budget_category_name, budget_planned, budget_available, budget_created_date, and user_id (foreign key). The relationship between the User and Budget entities is represented by the “perform” relationship, indicating that a user can perform multiple budgets. Meanwhile, the Expenses entity also contains six fields: expense_id (primary key), record_date, spent, income, expense_category_name, and user_id (foreign key). The “has” relationship between the User and Expenses entities indicates that a user can have multiple expenses.

4.2 Virtuous Sequence Reflections

Figure 8 reflects the guidance in register account. In this sequence diagram, the register account starts with the user accessing the register page and filling in the register details. Then the registration details will be sent to the page controller and be verified by it. After verification is completed, the page controller will store the user’s account details into the database. The registration results will be sent to the user after the data storing is completed.

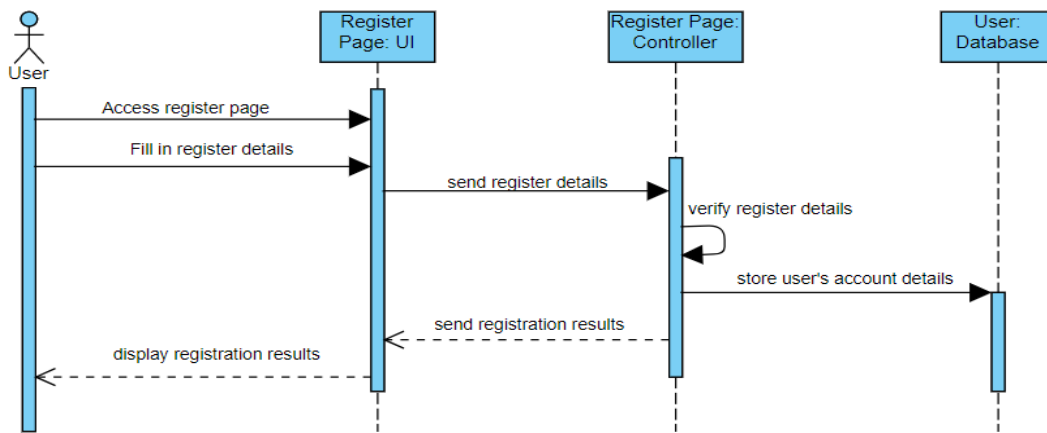


Figure 8. Register Account Sequence Diagram of Personal Financial Management Application (PFMA)

Figure 9 represents the login account sequence diagram. The login account starts with the user accessing the login page. The user fills in account details in the login page. After that, the login page controller will receive the account details and start the verification. If verification is successful, the user will receive the verification results.

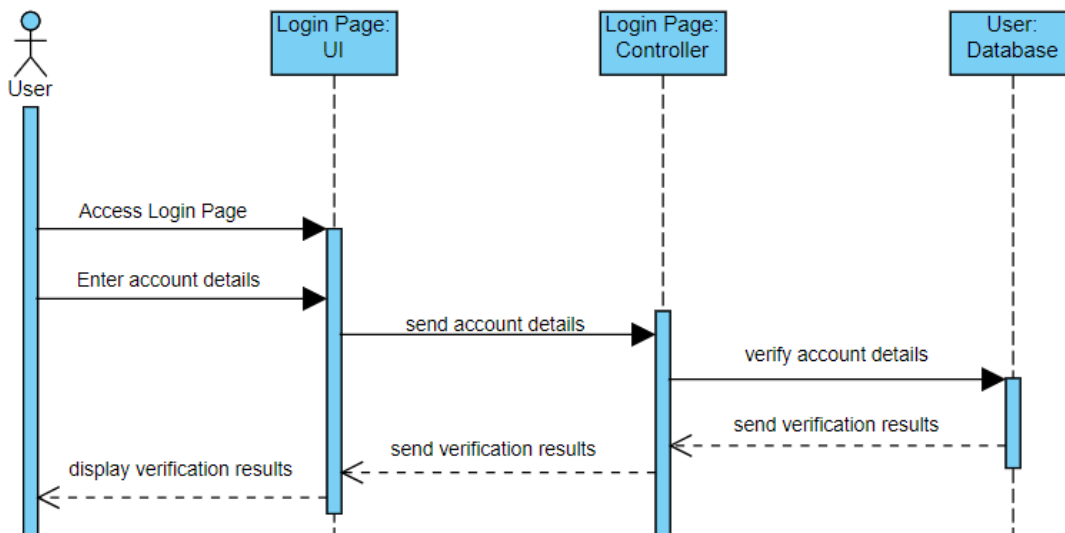


Figure 9. Login Account Sequence Diagram of Personal Financial Management Application (PFMA)

Figure 10 represents the record expenses sequence diagram. The record expenses starts with the user accessing the expenses page. The user will fill in the expenses details and the data will be sent to the page controller. The controller will then store it into the database. After successfully saving, a message will be shown to the user.

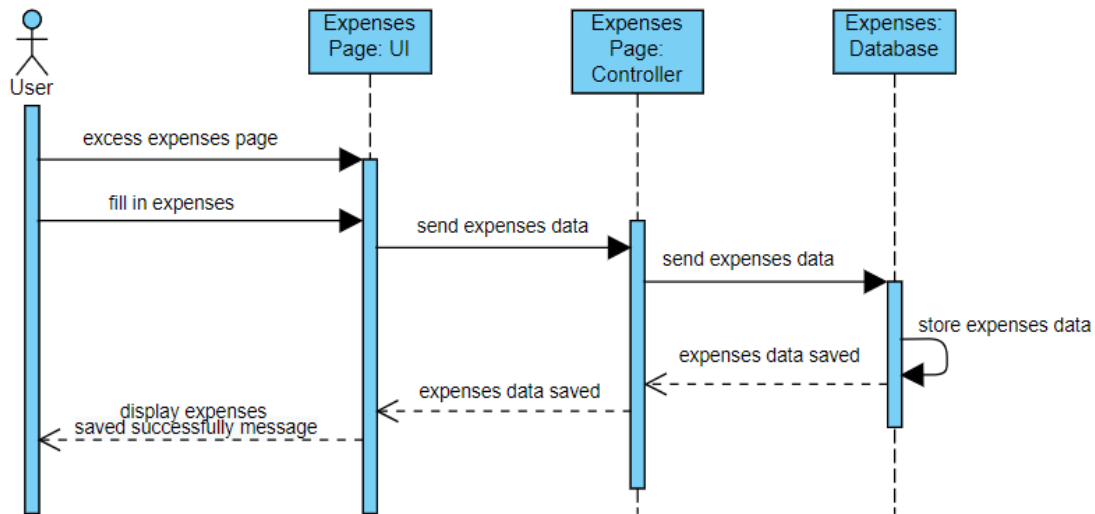


Figure 10. Record Expenses Sequence Diagram of the Personal Financial Management Application (PFMA)

Figure 11 represents the view daily expenses chart sequence diagram. The view daily expenses chart starts with the user accessing the insight page. The page will immediately request a daily expenses chart from the controller. The page controller will request data from the database and calculate the daily total expenses and send it back to the insight page. The insight page will then display the daily expenses chart.

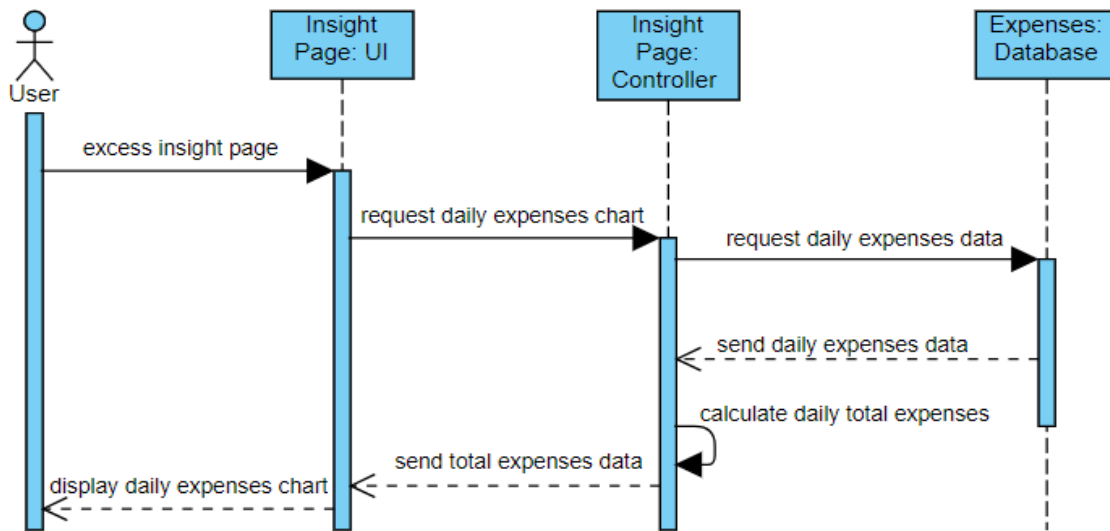


Figure 11. View Daily Expenses Chart Sequence Diagram of the Personal Financial Management Application (PFMA)

Figure 12 represents the created budget sequence diagram. The create budget starts with the user accessing the budget page. After the user fills in the budget details, the data will be sent to the page controller. The page controller will verify the budget details and send the data to the database for storing purposes. After the data successfully stored in the database, a successful message will be shown to the user.

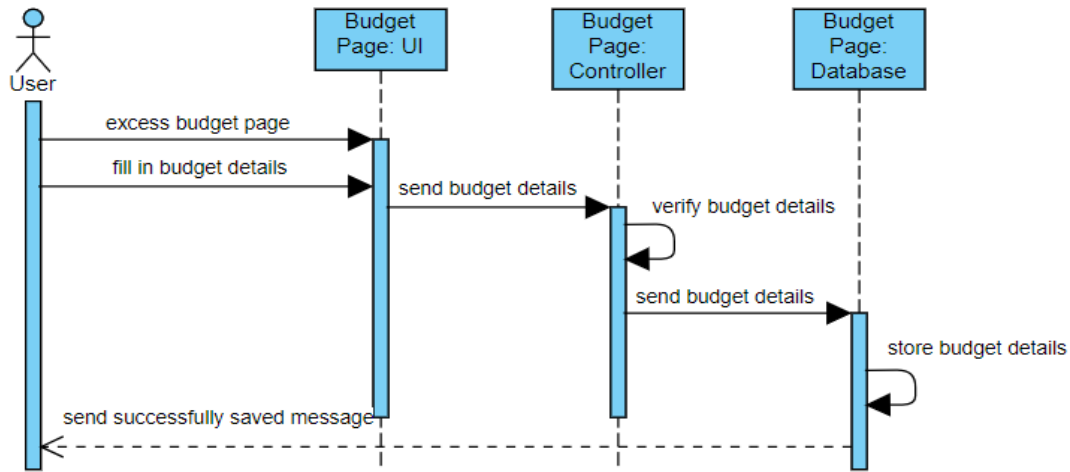


Figure 12. Create Budget Sequence Diagram of the Personal Financial Management Application (PFMA)

4.3 Resided Activity Reflections

The activity diagrams are aimed for seeing the reflections resided in the virtuous sequences explored in the previous section. This is to observe what would happen when the sequences are applied. Figure 13 represents the register account activity diagram for Personal Financial Management Application System (PFMA). The first step is to click on the “Register New Account” button, which will take the user to a registration form. The user has to fill out the registration form with the required information. Once the user submits the form, the system will check and save the registration details in the database. The user will then be taken to the homepage to log in.

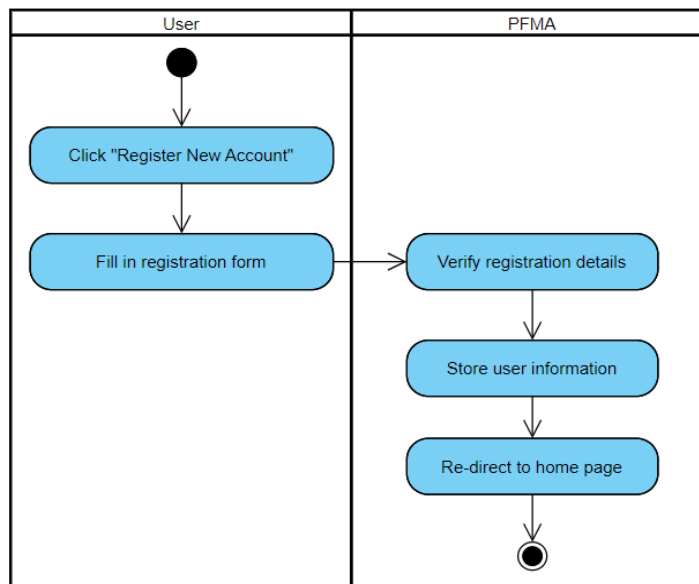


Figure 13. Register Account Activity Diagram of the Personal Financial Management Application (PFMA)

Figure 14 represents the login account activity diagram for PFMA. To initiate the login, the user clicks the "login account" button, prompting the display of the login form. Upon filling in the login details, the system verifies them with the database. In the case of a successful login, the system proceeds to show the home page.

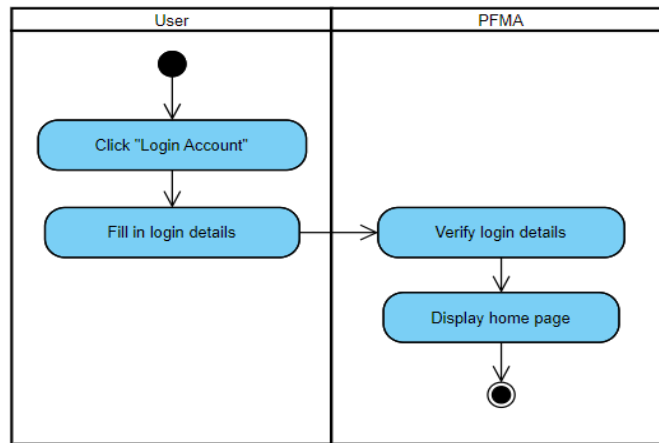


Figure 14. Login Account Activity Diagram of the Personal Financial Management Application (PFMA)

Figure 15 represents the record expenses activity diagram. In the same area in recording expenses, one probably would put in the expenses in need that approached in life compassion. This reflects the savings in return to offer good planning in expenses Firstly, the user selects the “add expenses” icon to record expenses. The system will display an expenses page to the user. The user then fills in expenses details and clicks on the “save” button. After the “save” button is clicked, the system stores the expense details into the database.

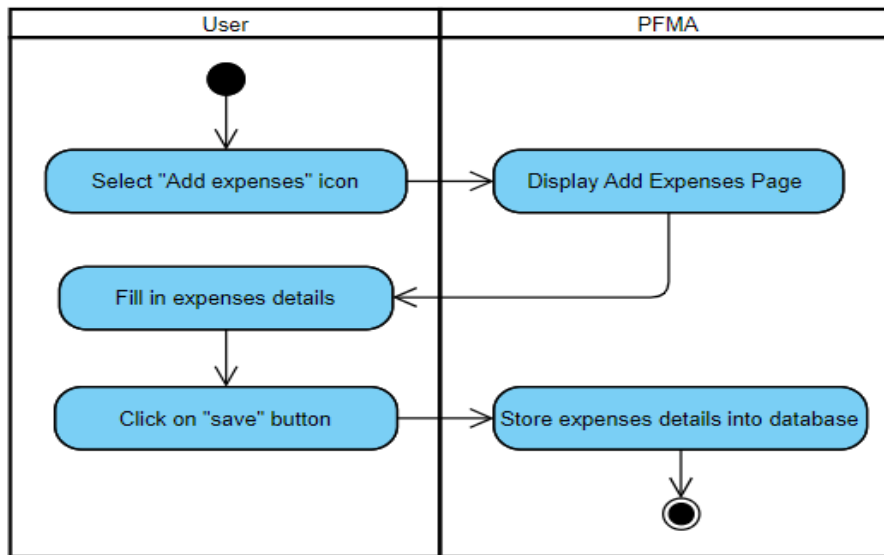


Figure 15. Record Expenses Activity Diagram of the Personal Financial Management Application (PFMA)

Figure 16 represents the filter by month activity diagram. First, the user selects the “expenses” icon. The system will display the current month’s expenses. The user could select a month out of the history. After the month selected, the system will display the recorded expenses details.

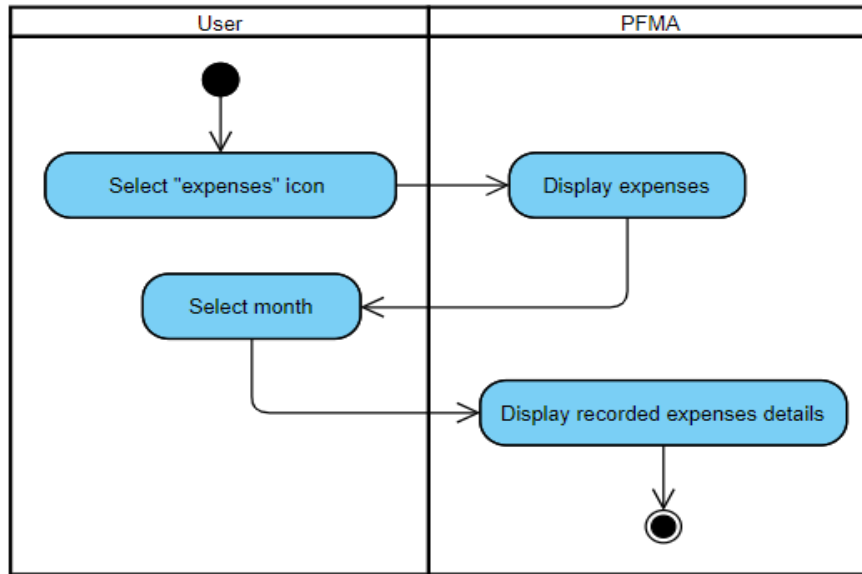


Figure 16. Filter By Month Activity Diagram of the Personal Financial Management Application (PFMA)

4.4 User Interface

Figure 17 highlights the main dashboard of the Personal Financial Management Application (PFMA) that directly gives a good financial overview. The available balance, budget for the respective month, and the expenses history are displayed at the first half of the page. This follows with the cash section, which consists of income, and expense.

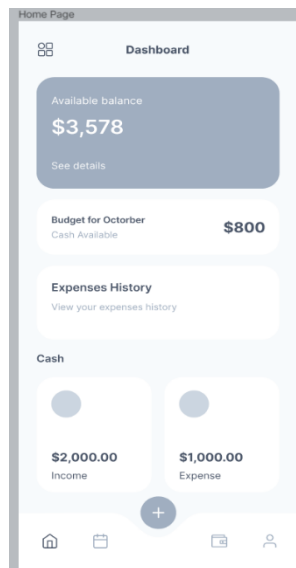


Figure 17. Home Page of the Personal Financial Management Application (PFMA)

Figure 18 shows that the budget page of the system. A daily expense chart is showing on top of the page. Following with a total budget for the current month. At the bottom of the page will be a button to add a budget category.

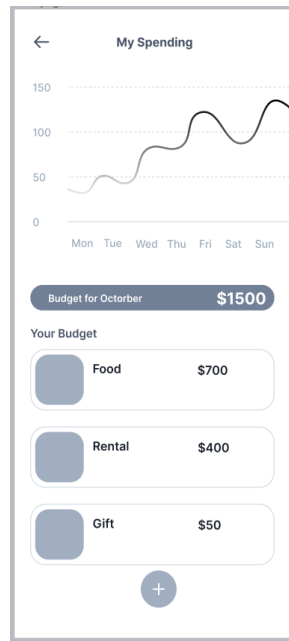


Figure 18. Budget Page of the Personal Financial Management Application (PFMA)

5. CONCLUSION

In conclusion, this paper details a thorough background study, requirement analysis, and design process that were executed. The Personal Finance Management Application (PFMA) was developed with a variety of features to help users gain insight on their expenses. The system goal is to provide a user-friendly interface that helps users understand their spending habits, thereby empowering them to make well-informed financial decisions for a financially secure future.

To sum up, the PFMA has the potential to add some additional enhancements to its existing functionality, by Lewis and Perry [14]. For instance, it could introduce a predictive budgeting function that uses historical user spending data to perform predictive analysis, by Carlin [15]. Additionally, it could integrate with a banking app to enable real-time expense tracking and other domain such as healthcare app [16],[17],[18],[19]. With this, one can provide the betterment of solutions financially applicable in the wide range of progressive web techniques such found in [20],[21],[22],[23].

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AUTHOR CONTRIBUTIONS

Jun-Xuan Kok: Conceptualization, Formal Analysis, Investigation, Methodology, Validation, Visualization, Writing – Original Draft Preparation;

Sin-Ban Ho: Conceptualization, Data Curation, Data Curation, Formal Analysis, Investigation, Methodology, Validation, Visualization, Resources, Supervision, Writing – Original Draft Preparation;

Chuie-Hong Tan: Project Administration, Supervision, Writing – Review & Editing

CONFLICT OF INTERESTS

No conflict of interests were disclosed.

ETHICS STATEMENTS




The paper follow The Committee of Publication Ethics (COPE) guideline.

REFERENCES

- [1] M. Z. A., Bakar, S. A., Bakar, & S. H., Ayub, “Financial Education as Moderating Influence in Prudent Financial Management Practices among Malaysian Youth”, *International Journal of Academic Research in Business and Social Sciences*, 10(2), pp. 1-11, 2020, DOI: <https://doi.org/10.6007/ijarbss/v10-i2/6856>
- [2] A., Mansurali, S., Ramakrishnan, S., Joghee, S., Kabiraj, & M. M., Bishnoi, “Fintech Innovations in the Financial Service Industry”, *Journal of Risk and Financial Management*, 15(7), pp. 287, 2022, DOI: <https://doi.org/10.3390/jrfm15070287>
- [3] C., Tymkiw, (2021). What Is Personal Financial Management? Investopedia. Retrieved July 21, 2021, from <https://www.investopedia.com/personal-financial-management-pfm-5181311>
- [4] D. A. T., Kumari, “The Impact of Financial Literacy on Investment Decisions: With Special Reference to Undergraduates in Western Province, Sri Lanka”, *Asian Journal of Contemporary Education*, 4(2), pp. 110-126, 2020, DOI: <https://doi.org/10.18488/journal.137.2020.42.110.126>
- [5] J., Irni, K., Rowlingson, & L., Appleyard, “The Effect of Personal Finance Education on the Financial Knowledge, Attitudes and Behaviour of University Students in Indonesia”, *Journal of Family and Economic*, 42(November), pp. 351-367, 2020, DOI: <https://doi.org/10.1007/s10834-020-09721-9>
- [6] K., Junaid, & R., Mestry, “The Oversight Functions of School Governing Bodies in the Management of Budgets”, *Perspectives in Education*, 41(4), 2023, DOI: <https://doi.org/10.38140/pie.v41i4.7512>
- [7] M., Padil, H., Kasim, E. S., Muda, S., Ismail, & N. M., Zin, “Financial Literacy and Awareness of Investment Scams among University Students”, *Journal of Financial Crime*, 29(1), pp. 355-367, 2022, DOI: <https://doi.org/10.1108/jfc-01-2021-0012>
- [8] A., Arvind, & H., Herrmann, “Artificial Intelligence and Fintech: An Overview of Opportunities and Risks for Banking, Investments, and Microfinance”, *Strategic Change*, 30(3), pp. 211-222, 2021, DOI: <https://doi.org/10.1002/jsc.2404>
- [9] K., Goyal, S., Kumar, & J. J., Xiao, “Antecedents and consequences of Personal Financial Management Behavior: a systematic literature review and future research agenda”, *International Journal of Bank Marketing*, 39(7), pp. 1166-1207, 2021, DOI: <https://doi.org/10.1108/ijbm-12-2020-0612>
- [10] L., Bartocci, G., Grossi, S. G., Mauro, & C., Ebdon, “The journey of participatory budgeting: a systematic literature review and future research directions”, *International Review of Administrative Sciences*, 89(3), pp. 757-774, 2023 DOI: <https://doi.org/10.1177/00208523221078938>

- [11] B., Mareike, C., Brück, T., Knauer, & A., Schwering, “Digitization of the Budgeting Process: Determinants of the Use of Business Analytics and Its Effect on Satisfaction with the Budgeting Process”, *Journal of Management Control*, 31(1-2), pp. 25-54, 2020, DOI: <https://link.springer.com/article/10.1007/s00187-019-00291-y>
- [12] S. A., Pedersen, B., Yang, & C. S., Jensen, “Fast Stochastic Routing under Time-Varying Uncertainty”, *The VLDB Journal*, 29(4), pp. 819-839, 2019, DOI: <https://doi.org/10.1007/s00778-019-00585-6>
- [13] B., Hélène, J., Cylus, W., Patcharanarumol, J., Novignon, T., Evetovits, & S., Gupta, “Do Efficiency Gains Really Translate into More Budget for Health? An Assessment Framework and Country Applications”, *Health Policy and Planning*, 36(8), pp. 1307-1315, 2021, DOI: <https://doi.org/10.1093/heapol/czab040>
- [14] M., Lewis, M., Sturdee, J. U., Davis, M., Gamboa, S. F., Alaoui, C. E., Ohlenschlager, W., Gaver, E., Bleviss, & L., Loke, “Is it Art, is it HCI? Exploring Tensions Between Practice and Research”, *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, Article No. 525, pp. 1-4, 2023, DOI: <https://doi.org/10.1145/3544549.3583744>
- [15] C., Bruce, A., Olafsson, & M., Pagel, “Mobile Apps and Financial Decision Making”, *Review of Finance*, 27(3), pp. 977-996, 2023, DOI: <https://doi.org/10.1093/rof/rfac040>
- [16] W.-X., Ong, S.-B., Ho, & C.-H., Tan, “Enhancing Migraine Management System through Weather Forecasting for a Better Daily Life”, *Journal of Informatics and Web Engineering (JIWE)*, 2(2), pp. 201-217, 2023, DOI: <https://doi.org/10.33093/jiwe.2023.2.2.15>
- [17] S.-B., Ho, E.-Y., Chew, & C.-H., Tan, “Streamlining Dental Clinic Management for Effective Digitisation Productivity and Usability”, *Journal of Informatics and Web Engineering (JIWE)*, 3(2), pp. 70-85, 2024, DOI: <https://doi.org/10.33093/jiwe.2023.3.2.5>
- [18] J.-L., Goh, S.-B., Ho, & C.-H., Tan, “Weather-Based Arthritis Tracking: A Mobile Mechanism for Preventive Strategies”, *Journal of Informatics and Web Engineering (JIWE)*, 3(1), pp. 210-225, 2024, DOI: <https://doi.org/10.33093/jiwe.2024.3.1.14>
- [19] S. N., Kalid, S.-B., Ho, A., Ibrahim, J. H. N., Azman, S.-J., Tan, & J.-E., Cheong, “Enhancing personalized healthcare with an effective E-Healthcare Management System”, *Journal of System and Management Sciences (JSMS)*, 14(2), pp. 482-497, 2024, DOI: <https://doi.org/10.33168/JSMS.2024.0230>
- [20] X.-X., Cho, S.-B., Ho, and C.-H., Tan, “Improving asthma treatment adherence by integrating weather information with responsive web technique”, *AIP Conference Proceedings*, vol. 3153, 030005, 2024, DOI: <https://doi.org/10.1063/5.0216655>
- [21] G. A., Makho, S.-B., Ho, and I., Chai, “Exploring the potential of artificial intelligence in the medical sector for patient well-being: A review technique”, *AIP Conference Proceedings*, vol. 3153, 030003, 2024, DOI: <https://doi.org/10.1063/5.0216651>
- [22] M. E. K. K., Khairi, S.-B., Ho, and C.-H., Tan, “Real-time tracking and category filtering of an automated system for trading cards collections”, *AIP Conference Proceedings*, vol. 3153, 060001, 2024, DOI: <https://doi.org/10.1063/5.0216659>
- [23] R. J. Y., Kok, S.-B., Ho, and C.-H., Tan, “Improving the prediction resolution time for mobile eczema support system”, *AIP Conference Proceedings*, vol. 3153, 030007, 2024, DOI: <https://doi.org/10.1063/5.0216658>

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