# eSaku: An Interactive Mobile App for University Students to Manage Expenses

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***Abstract*—eSaku is an interactive mobile application designed to help university students manage their finances more effectively. The development process follows the Rapid Application Development (RAD) methodology, which emphasizes iterative design and user feedback to create a functional and user-friendly product. Data for the app's design and features were gathered through surveys conducted among university students to ensure that it meets their specific financial management needs. The aim of eSaku is to provide students with a comprehensive tool that enables them to track their expenses, plan budgets, set financial goals, and monitor their spending habits. The app includes key features such as income and expense tracking, semester-based budgeting, goal setting for savings, and payment reminders for academic-related expenses. Users can categorize financial records and analyze their spending through visual charts, while its intuitive interface allows easy navigation across various financial tasks. By focusing on the essential financial management needs of university students, eSaku aims to help students understand their financial habits, make informed decisions, and achieve their financial goals through a simple and efficient mobile platform.**

***Keywords—budgeting, expense tracking, financial management, mobile application, spending habits***

## I. INTRODUCTION

University students often face financial management challenges due to limited financial literacy, unpredictable expenses, and low income [6][16]. These difficulties can lead to poor financial habits, negatively impacting long-term financial stability [7]. Traditional tools like spreadsheets are often ineffective, highlighting the need for a simple, user-friendly mobile app tailored to students' needs.

eSaku is a mobile app designed to address these challenges by helping students track expenses, set budgets, and predict future spending. The app integrates real-time financial tracking with educational resources, promoting better financial decision-making. This aligns with the increasing use of mobile applications for financial management, with over 22 million UK adults utilizing mobile banking and budgeting apps [5].

Incorporating just-in-time financial education, eSaku allows students to apply financial knowledge immediately, fostering positive financial habits [3]. By enhancing financial literacy, eSaku aims to empower students with the skills needed for effective financial management, improving long-term economic well-being [10].

The app's development follows the Rapid Application Development (RAD) model, which focuses on rapid prototyping and incorporating user feedback [12]. The project seeks to identify essential features, evaluate the app's UI/UX, and test its effectiveness in improving financial management skills. The goal of eSaku is to equip students with the tools to manage their finances effectively, fostering financial independence and responsibility [2].

## II. LITERATURE REVIEW

This section compares three existing financial management applications—Wallet: Budget & Money Manager [1], Money Manager Expense & Budget [11], and CashBook [9]. The comparison is based on key features such as attaching images to records, visualizing spending through interactive charts, and setting and monitoring budgets. Additional features, including reminder systems for academic payments, search functionality, and a clean, user-friendly interface, are also examined. Table I summarizes the features of these applications.

TABLE I. COMPARISON TABLE OF THREE EXISTING FINANCIAL MANAGEMENT APPS

| **Included Features** | **Three Existing Financial Management Apps** | | |
|---|---|---|---|
| | ***Wallet: Budget & Money Manager*** | ***Money Manager Expense & Budget*** | ***Cashbook*** |
| Manage Financial Records by Semester | ✕ | ✕ | ✕ |
| Attach Images to Records | ☑ | ☑ | ☑ |
| Interactive Charts for Spending Visualization | ☑ | ☑ | ✕ |
| Set and Monitor Budgets and Goals | ☑ | ✕ | ✕ |
| Reminder System for Academic Payments | ✕ | ✕ | ✕ |
| Clean and User-Friendly Interface | ✕ | ✕ | ☑ |
| Search and Filter Financial Records | ✕ | ☑ | ☑ |
| Simple Navigation | ✕ | ✕ | ☑ |

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As shown in Table I, all three applications allow users to attach images to financial records, making expense tracking more detailed. However, CashBook does not provide interactive charts for spending visualization, a feature available in both Wallet: Budget & Money Manager and Money Manager Expense & Budget. Only Wallet: Budget & Money Manager includes functionality for setting and monitoring budgets and financial goals, while the other two apps lack this capability.

Despite their advantages, none of the three applications offer a reminder system for academic payments, which could benefit students managing tuition fees and other academic-related expenses. Additionally, while CashBook provides a clean and user-friendly interface with simple navigation, Wallet: Budget & Money Manager and Money Manager Expense & Budget fall short in this aspect. Search and filtering functionality is present in both Money Manager Expense & Budget and CashBook, but it is absent in Wallet: Budget & Money Manager.

The findings highlight the strengths and limitations of existing financial management applications. While they provide useful expense tracking tools, they lack features specifically catering to academic financial management, such as structured semester-based record-keeping and academic payment reminders. These gaps suggest opportunities for improvement in financial management applications to better address the diverse needs of users, particularly students managing both personal and academic expenses.

## III. Methodology

Rapid Application Development (RAD) as shown in Fig. 1, is a development model focused on quick iteration and continuous user feedback, structured in four phases: Requirements Planning, User Design, Construction, and Cutover [12]. This model was chosen for the eSaku project to ensure rapid prototyping and user-centered design, allowing for an optimized and user-friendly application. By emphasizing speed and user input, RAD enables eSaku to meet functional requirements while delivering a seamless user experience for university students.

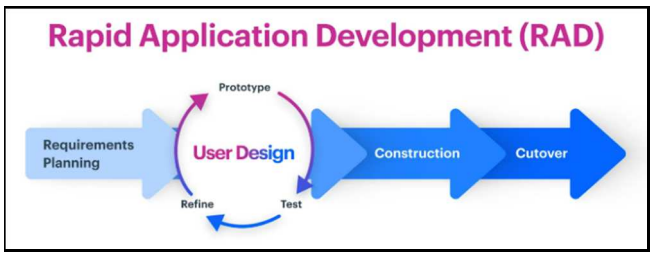


Fig. 1. Rapid Application Development (RAD) Model [12]

### A. Requirements Planning

The Requirements Planning phase focused on gathering and defining the key features for the eSaku financial management app. A survey was distributed to 30 university students to capture their needs and preferences, providing valuable insights into essential features such as expense tracking, budgeting, and reminders. Functional requirements were established, including user account management and financial record tracking, along with non-functional requirements like usability and security. This phase also involved selecting the appropriate software and hardware tools for development. The phase provided a strong foundation for designing an app that effectively addresses the financial challenges faced by university students.

### B. User Design

The User Design phase focuses on creating detailed design models and wireframes for the eSaku app, ensuring that the application aligns with user needs identified in the previous phase. This phase includes developing use case diagrams to define user interactions, user flow diagrams to visualize app navigation, and activity diagrams to outline the sequence of actions within the app. Additionally, class diagrams will be created to depict the structure of the app's data and objects, while high-fidelity wireframe designs will be developed to demonstrate the visual and functional layout of the app, offering a clear representation of the final product. This phase ensures that the design is both user-centric and functional, ready for development and testing.

The first UML diagram of the proposed app is the use case diagram. Use cases specify the expected system behavior from the end user's perspective, focusing on what the system does rather than how it is implemented, and can be represented both textually and visually (i.e., use case diagram) to communicate system actions in an understandable way [14]. Fig. 2 illustrates the use case diagram for the proposed app, eSaku.

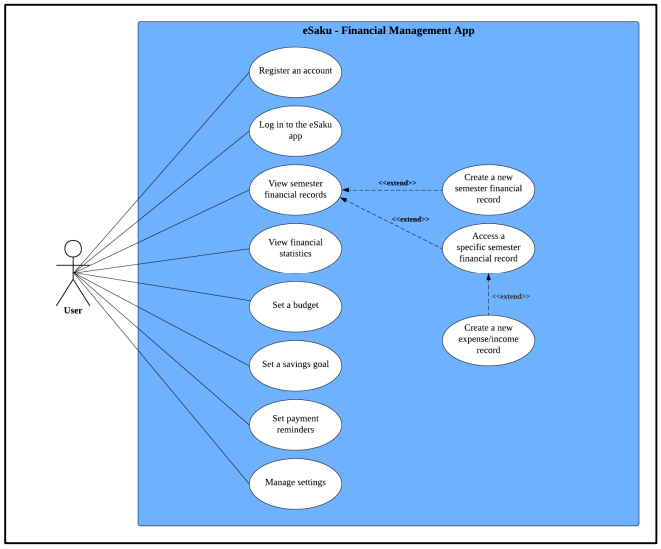


Fig. 2. Use Case Diagram for eSaku

Secondly, sequence diagrams. According to [13], UML Sequence Diagrams illustrate the flow of messages between objects over time, modeling interactions between users, subsystems, or external systems. They depict the sequence of events that realize a use case or operation, using time as the vertical axis to show the order of interactions. Fig. 3 illustrates one of the sequence diagrams for the proposed app, eSaku.

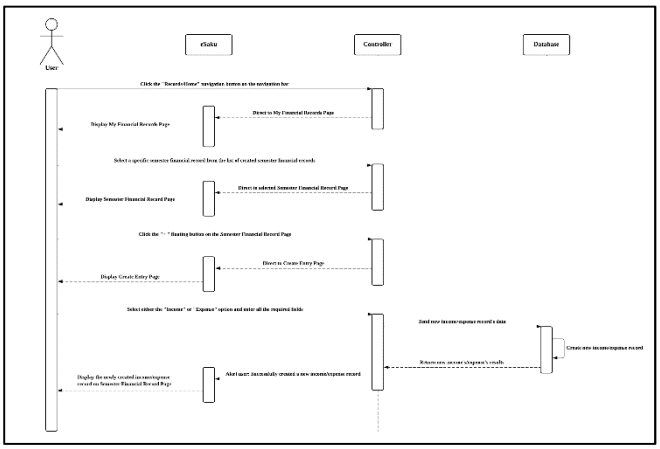


Fig. 3. Create New Expense/Income Record Process Sequence Diagram for eSaku

Next, activity diagram. An activity diagram is a Unified Modeling Language (UML) flowchart that illustrates the flow of activities within a system, mapping out the sequence of actions, decision nodes, and data flow, and is commonly used in business process modeling and use case detailing [8]. Fig. 4 illustrates the activity diagram for the proposed app, eSaku.

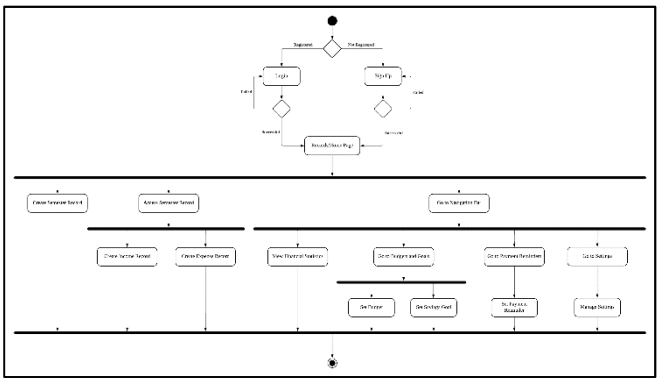

Fig. 4. Activity Diagram for eSaku

Then, class diagram. The UML Class Diagram is a graphical tool for designing and visualizing object-oriented systems, depicting the static structure through classes, attributes, methods, and the relationships between objects [15]. Fig. 5 shows the class diagram for the proposed app, eSaku.

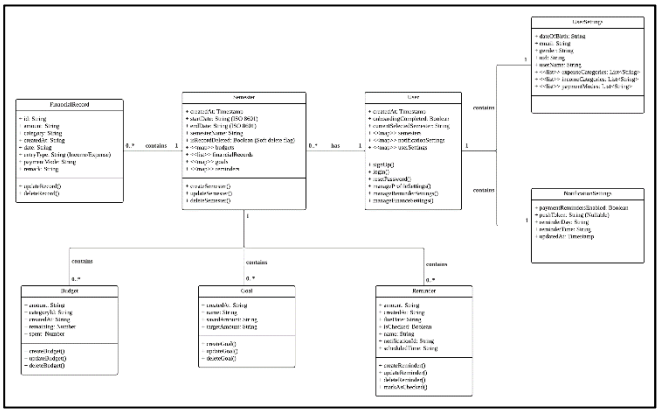

Fig. 5. Class Diagram for eSaku

In UX design, wireframes act as essential blueprints, illustrating the layout of a page or application [4]. High-fidelity wireframes include detailed elements and interactive components, offering a realistic preview of the user experience to ensure alignment with user expectations and design goals [4]. Fig. 6 through 11 depict the high-fidelity wireframe designs of the main screens for the proposed app, eSaku.

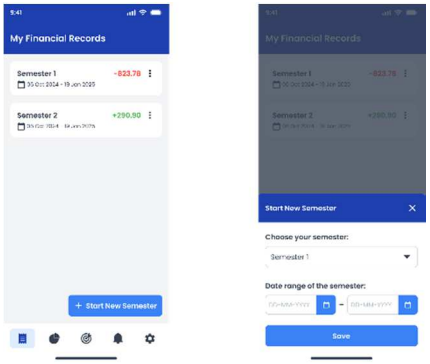


Fig. 6. Wireframe of the My Financial Records Page for eSaku

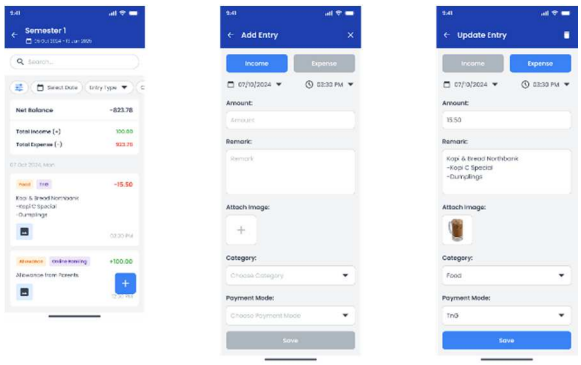


Fig. 7. Wireframe of the Income/Expense Records List Page for eSaku


Fig. 8. Wireframe of the Statistics Page for eSaku

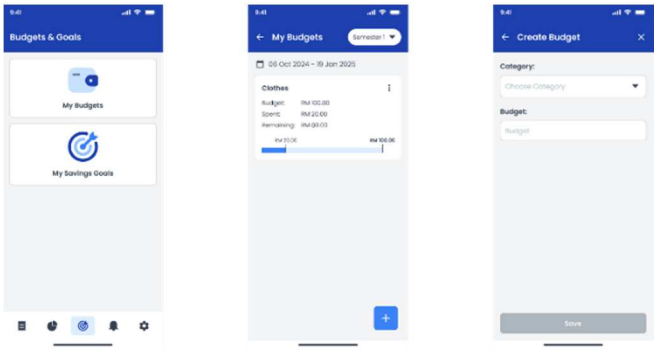


Fig. 9. Wireframe of the Budgets & Goals Page for eSaku

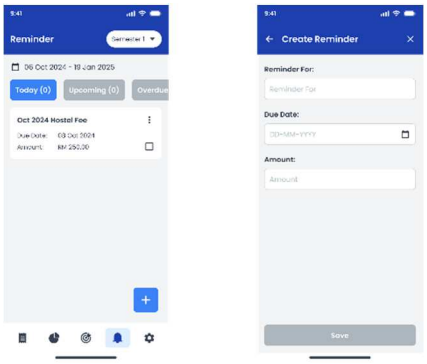


Fig. 10. Wireframe of the Payment Reminders Page for eSaku

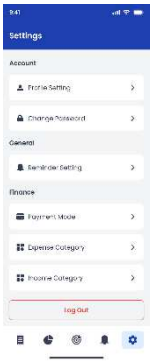


Fig. 11. Wireframe of the Settings Page for eSaku

### C. Construction

The Construction phase marks the transition from design to actual development. The eSaku application was built using React Native for the frontend to support Android devices, and Firebase as the backend solution for real-time database management, authentication, and data synchronization.

The development process encompassed several key modules, including user authentication features such as sign-up, login, and password recovery; financial record management that allows users to add income and expense entries with customizable categories and payment modes; and a semester-based record organization system designed to align financial tracking with academic timelines. In addition, the application integrates budget and savings goal tracking, payment reminders for important financial deadlines, and financial statistics represented through interactive pie chart visualizations. A settings module was also included to enable users to personalize their preferences within the app.

Development was conducted iteratively, with continuous testing and debugging to ensure stability. Each module was tested immediately after implementation to maintain quality control.

Due to Firebase's storage limitations under the free plan, the image attachment feature proposed in earlier phases (e.g., for receipt uploads and profile pictures) was removed from the final version. The final deliverable includes an Android APK file.

### D. Cutover

The Cutover phase prepared eSaku for usability testing and final presentation. This phase involved several key activities, including final integration testing to ensure that all modules functioned cohesively and UI/UX polishing to optimize navigation flow and interface consistency. The Android .apk file was then deployed for real device testing to evaluate performance in a practical environment. Following deployment, a usability testing questionnaire was distributed to 30 university students.

Participants accessed the application through Expo Go or the provided APK and submitted their feedback via a structured survey designed to assess the UI/UX, core features, and overall satisfaction. This phase marked the formal transition from development to evaluation, ensuring that the application was ready for user testing and final assessment.

## IV. Key Features and Implementations

Based on requirements gathered from a survey titled "Survey on User Experience and Preferences for a Financial Management App Customized for University Students" involving 30 university students, eSaku was developed with a focus on simplicity, clarity, and student-centric features.

### A. Semester-Based Financial Management

The core feature of eSaku is its ability to organize all financial data by academic semester. As shown in Fig. 12, the main screen displays a list of semesters, each with its net balance. Users can tap into a specific semester to view a detailed breakdown of all income and expense transactions recorded within that period. This directly addresses a key need identified in our user research, where 63.3% of students found semester-based planning more effective than traditional monthly planning.

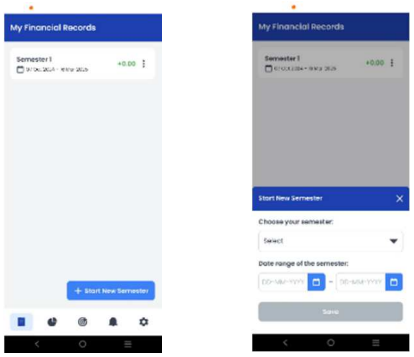


Fig. 12. The main dashboard of eSaku, which displays financial records organized by academic semester.

### B. Interactive Financial Statistics

To provide users with clear insights into their spending habits, eSaku includes a dedicated statistics module. As seen in Fig. 13, this screen presents an interactive pie chart that visualizes the breakdown of income or expenses by category for the selected semester. Tapping a slice of the chart reveals detailed information, empowering users to easily identify where their money is going and make informed budgeting decisions. The importance of such visual tools was confirmed by our survey, where 66.7% of respondents indicated that interactive charts would be a useful feature


Fig. 13. The financial statistics screen, featuring an interactive pie chart for visualizing income and expense breakdowns per semester.

### C. Budgets, Goals, and Reminders

eSaku allows users to set category-specific budgets for each semester and track their spending against these limits. A progress bar provides an immediate visual cue of their budget status. Similarly, users can create savings goals (e.g., "New Laptop," "Holiday Trip") and track their progress over time. To help students stay on top of important deadlines, the app also includes a reminder system for academic-related payments like tuition and hostel fees. This feature was rated as important or extremely important by over 80% of survey respondents.

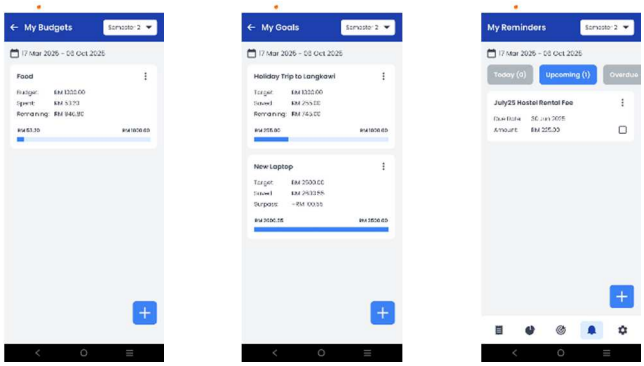


Fig. 14. My Budgets, My Goals and My Reminders Screens

## V. Results and Discussion

This section presents findings from the usability testing phase, conducted with 30 university students who actively used the eSaku app. The evaluation is organized according to the five sections of the questionnaire.

### A. General Information

The majority of participants (96.7%) were between 18 and 24 years old, representing the core target audience of university students. Gender distribution was balanced with 50% male and 50% female participants. Respondents came from Science and Engineering (63.3%), Business and Economics (26.7%), and Arts and Humanities (10%). Approximately 63.3% had prior experience with financial management applications, while 36.7% were first-time users. This ensured that the feedback represented both novice and experienced perspectives.

### B. User Interface and User Experience (UI/UX)

The application received very positive ratings for ease of navigation, with 96.7% of participants rating it as "easy" or "very easy." In terms of design, 90% of respondents found the interface visually appealing, and 100% agreed that the design was consistent across screens. Furthermore, 86.7% of participants expressed confidence in using the app without instructions, indicating that the interface was intuitive even for first-time users.

### C. Features and Functionality

Core modules were strongly endorsed by participants. All respondents rated the income and expense tracking feature as useful or very useful. Visualization tools, such as charts, were rated as clear or very clear by 100% of participants, confirming that financial data was presented in an understandable format to support decision-making. Budgeting and goal-setting features were rated as helpful or very helpful by 96.7% of respondents, while the payment reminder feature received 100% positive feedback. This highlights the importance of reminders in assisting students to manage tuition fees and academic-related payments. The semester-based record system was also well received, with 73.3% rating it as very useful and 23.3% as somewhat useful, validating its relevance as a student-focused innovation.

### D. Overall App Experience

Satisfaction levels were consistently high, with 100% of respondents indicating that eSaku was suitable for university students. All participants reported they would recommend the application to peers, with 50% selecting "definitely yes" and 50% selecting "probably yes." These results suggest strong adoption potential among the student community.

### E. Suggestions and Future Intent

Participants also provided several suggestions for enhancement. These included the addition of onboarding tutorials, pre-set expense categories, a dark mode, more flexible reminder settings, and advanced features such as bank integration and personalized financial tips. This feedback provides valuable direction for the next stage of development.

The summarized findings across usability, functionality, satisfaction, and adoption potential are presented in Table II.

TABLE II. Usability Testing Outcomes (N = 30)

| Evaluation Aspect | Key Findings |
|---|---|
| User Interface (UI/UX) | 96.7% rated navigation as Easy/Very Easy; 90% found design Attractive; 100% agreed screens consistent; 86.7% confident without instructions |
| Core Features | 100% rated Income/Expense Records useful; 100% rated Statistics clear; 96.7% rated Budgets & Goals helpful; 100% rated Payment Reminders helpful |
| Semester-Based Records | 73.3% rated Very Useful; 23.3% rated Somewhat Useful |
| Overall Satisfaction | 100% rated app as Satisfied or Very Satisfied |
| Suitability for Students | 100% agreed app was relevant to university students |
| Adoption Potential | 100% would recommend to peers; 100% intend to continue using (63.3% Definitely Yes, 36.7% Probably Yes) |

In conclusion, the usability testing results (as summarized in Table II) provide strong evidence that eSaku is an intuitive, practical, and well-received application for financial management among university students. The positive ratings

across usability, functionality, and overall experience confirm that the application successfully addresses the needs of its target audience while also offering clear directions for refinement and future development.

## VI. Conclusion and Future Work

### A. Conclusion

The eSaku project successfully achieved its objective of delivering a tailored financial management mobile application for university students. Built using the RAD methodology, the app incorporates essential features like financial tracking, budgeting, and reminders, while maintaining an intuitive interface. Usability testing confirmed the app's effectiveness, with overwhelmingly positive feedback from participants.

However, several limitations were identified during development and testing. These include the absence of image attachment functionality due to Firebase's free-tier limitations, the need for manual transaction entry with no bank integration, and the lack of advanced analytics and collaborative features. Additionally, the semester record feature currently supports a maximum of ten records, and payment reminder notifications can only be triggered when the application is not in use. These limitations provided valuable direction for future enhancements.

### B. Future Work

To address the identified limitations and user feedback, several future developments are proposed to enhance the functionality and user experience of eSaku. These include the integration of bank connectivity with automatic transaction categorization, the addition of tutorials and onboarding guides for new users, and the introduction of a dark mode with more visual budget cues. Personalized financial tips and performance optimization for handling large datasets are also planned to improve usability and responsiveness. Further enhancements such as on-the-spot category or payment mode creation during record entry, collaborative features for managing shared expenses, and a multi-semester overview with trend analytics will provide greater flexibility and insight. In addition, improved offline functionality is envisioned to ensure accessibility without continuous internet connectivity. By implementing these enhancements, eSaku can evolve into a more intelligent, adaptable, and indispensable financial tool for students.

## Acknowledgment

I would like to express my sincere gratitude to my supervisor, Mr. Jonathan Anak Sidi, for his invaluable guidance and constructive feedback, as well as to Professor Wang Yin Chai, the Final Year Project Coordinator, for his continuous support and direction. My appreciation also goes to Universiti Malaysia Sarawak (UNIMAS) for providing the platform to enhance my knowledge and skills, and to my family and friends for their constant encouragement and motivation throughout this journey. The authors also wish to thank Universiti Malaysia Sarawak for the financial support provided for this project.

## References

[1] BudgetBakers. (2021). Wallet: Budget & money manager. https://play.google.com/store/apps/details?id=com.droid4you.application.wallet&hl=en

[2] Chuah, S. C., Juliana, N. K., & Singh, J. K. (2020). Factors affecting financial management behaviour among university students. MALAYSIAN JOURNAL of CONSUMER and FAMILY ECONOMICS, 25, 154–174. https://majcafe.com/wp-content/uploads/2022/11/Volume-25-2020-Paper-7.pdf

[3] Cull, M., & Attard, C. (2021). Improving financial capability among university students using a mobile app: Wallet$mart project evaluation. Western Sydney University. https://doi.org/10.26183/r6bs-s098

[4] Douglas, C. (2024). What is a high-fidelity wireframe and when to use it? https://www.visily.ai/blog/what-is-a-high-fidelity-wireframe/

[5] French, D., McKillop, D., & Stewart, E. (2019). The effectiveness of smartphone apps in improving financial capability. The European Journal of Finance, 26, 302–318. https://doi.org/10.1080/1351847x.2019.1639526

[6] Gumbo, L., Mutengezanwa, M., & Chagwesha, M. (2022). Personal financial management skills of university students and their financial experiences during the covid-19 pandemic. International Journal of Financial, Accounting, and Management, 4, 129–143. https://doi.org/10.35912/ijfam.v4i2.835

[7] Maury, P., Ghatkar, P., Rane, M., & Bhosale, S. (2024). Case study on budget tracker app. International Journal of Research Publication and Reviews Journal Homepage: Www.ijrpr.com, 5, 3539–3544. https://ijrpr.com/uploads/V5ISSUE2/IJRPR22995.pdf

[8] MindManager. (2020). Guide to understanding activity diagrams. https://www.mindmanager.com/en/features/activity-diagram/?srsltid=AfmBOoqDjt20NgW_xvAAtd1F5pS-vbHt0WYI4vb09vcsGcFjdWFWhpvj

[9] Obopay. (2023). Cashbook vs. traditional bookkeeping: Which one is right for your business? https://cashbook.in/blogs/cashbook-vs-traditional-bookkeeping-which-one-is-right-for-your-business/

[10] Prakoso, T., & Apriliani, R. (2024). A systematic review of financial management practices in developing countries: Trends, challenges and future directions. International Journal of Financial Economics (IJEFE), 1, 724–732. https://ijefe.my.id/index.php/economic/article/view/70

[11] Realbyte Inc. (2021). Money manager expense & budget. https://play.google.com/store/apps/details?id=com.realbyteapps.moneymanagerfree&hl=en

[12] Team Kissflow. (2024). What is rapid application development (RAD)? An ultimate guide for 2024. https://kissflow.com/application-development/rad/rapid-application-development/

[13] Visual Paradigm. (2019a). What is sequence diagram? https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-sequence-diagram/

[14] Visual Paradigm. (2019b). What is use case diagram? https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-use-case-diagram/

[15] Visual Paradigm. (2024). UML class diagram tutorial. https://www.visual-paradigm.com/guide/uml-unified-modeling-language/uml-class-diagram-tutorial/

[16] Walstad, W., Urban, C., Carlos, J. A., Breitbach, E., Bosshardt, W., Heath, J., O'Neill, B., Wagner, J., & Xiao, J. J. (2017). Perspectives on evaluation in financial education: Landscape, issues, and studies. The Journal of Economic Education, 48, 93–112. https://doi.org/10.1080/00220485.2017.1285738