Developing AI-Powered Android Application about Self-financial Management for Individuals "FinGuard"

S. M. Anushka S. Samarakoon
School of Computing
SLIIT City Uni
anushkasamarakoon8@gmail.com

N.A.Pubudu Nallaperuma
School of Computing
SLIIT City Uni
pubudu.n@sliit.lk

***Abstract*—In this paper the author presented the development of "FinGuard" an artificial intelligence powered android application intended to aid individuals in effectively managing their finances. The application addresses common money issues like executive daily expenditures, lack of income, and financial ignorance. They lead to individuals taking loans, pawning items or borrowing money actions that compromise long-term financial stability. FinGuard offers income and expense tracking services, automated report generation, monthly predictive analysis, customizable reminder feature, advice for financial management feature and a chatbot for get answers for user problems inside the application. The user credentials are shielded from unauthorized use through secure login functionality. FinGuard applies a full and smart process to improve personal financial wellness and promote good financial management habits.**

Keywords—Financial management, Android application, artificial intelligence, predictive analytics, customizable reminders.

I. INTRODUCTION

In the modern days, personal finance management is the need of the hour and a challenging one. Few individuals lack proper tools or expertise to monitor their income, expenditure, savings and investment in one place. Not being able to manage finances in an organized manner leads to increased debt, unplanned spending, and financial instability in the long run. This research attempts to address these challenges with the innovation and development of an AI-driven android application named FinGuard, a personal finance advisor.

II. LITERATURE REVIEW

Financial management involves strategic planning, organizing, directing, and controlling financial resources to achieve organizational or personal objectives [4]. Over the years, numerous research studies have explored financial management and financial management systems. A key problem identified by previous researchers is the growing financial challenge where individuals face high expenses with low income [6]. To address this issue, several Android applications, such as Mint, YNAB (You Need A Budget), and Personal Capital, have been developed [2]. However, these applications lack future financial prediction capabilities, a gap that the proposed "FinGuard" application aims to fill.

Existing financial management tools like Mint, YNAB, and Personal Capital are widely used globally, but Personal Capital is restricted to American users due to its bank integration feature, which only supports U.S. financial institutions [5]. The rapid evolution of technology has transformed personal finance management, shifting from basic budgeting tools to AI-driven systems that offer personalized insights, spending analytics, and goal-setting features [1]. Despite these advancements, gaps remain in user personalization, predictive accuracy, and intuitiveness [9].

The "FinGuard" application introduces a predictive financial management system that forecasts monthly financial trends and generates reports, helping users track their finances efficiently. Unlike traditional tools, FinGuard leverages predictive modeling to provide users with future financial projections, enhancing decision-making [1][6].

Several studies support the need for intelligent financial systems. Arun highlights the role of predictive modeling in modern financial tools [1], while Boyles discusses various financial forecasting methods that improve business and personal financial planning [2]. Additionally, Kim (2024) examines the impact of financial technology adoption, emphasizing the growing reliance on mobile financial applications [5].

In conclusion, while existing financial management applications offer budgeting and expense tracking, FinGuard stands out by incorporating predictive analytics, addressing a critical gap in personal financial planning.

III. PROBLEM STATEMENT

https://doi.org/10.54389/DDOO6186

The key issues that have been observed are lack of proper tracking of daily expenditures, unbalanced financial habits, and reliance on external finances such as loans or pawn services. These habits result in long-term financial woes. Low income and high expenditure levels are the prevailing ailments that most individuals suffer from owing to a deficiency of structured financial tracking systems. The need for a user-friendly, smart tool that will help users to track, analyze, and manage their finances effectively is of primary importance.

IV. AIM AND OBJECTIVES

Aim - Developed an android application for introduced easy techniques for all individuals and given brief ideas to handle their finances for achieving their financial goals.

Objectives - The primary objectives are as follows,

- Developed an application to help users organize their finances such as income, expenses, savings and investments in one place.
- Developed an application for providing tools for users to create budget into spending patterns and use artificial intelligence to analyze user spending habits for get them financially stable.
- Developed an application to assist users in settings and achieving savings goals by tracking and tips.
- Developed an application for giving vest features to help users and manage, pay down debt with alert and reminders.
- The application has maintained high security features to protect user data.
- It gives reminders to users of upcoming bill payments such as water bills and electricity bilandnd, reminds us of a low balance of money.

V. SYSTEM OVERVIEW

A. *Income and Expense Tracker:* Allows users to manually input financial information with categorization.
B. *Financial Reports:* Calculates automatically daily, weekly, monthly, and annual reports on incomes, expenses, and savings.
C. *Prediction Insights:* Monitor user activity and provide tailored monthly predictions and reminders for better saving plans.
D. *Budgeting Help:* Helps create and maintain budgets with reminders when near or over limits. Also calculates total savings using added income and expenses.
E. *Calendar Reminders:* Alerts users to upcoming bill payments such as water bill payments and rent payments. Also, alerts with low balance, high expenses and missed expenses.
F. *Security Protocols:* Facilitates user login using personal passwords to expense and maintain a user account.
G. *Advice manager with a chatbot:* Give tips for better financial management with a chatbot feature. The chatbot provides answers to any questions provided by users.

VI. METHODOLOGY

The system follows the Agile methodology with software development lifecycle focusing on continuous testing and improvements. It follows steps in software development life cycle.

VII. DEVELOPMENT

The development process has three parts, such as front-end development, MySQL database development and backend development. The frontend development of the project was developed using XML and Java in Android studio, with the focus on user-friendly, intuitive and best visually looking interface, As the central point of user interaction with the application, the frontend plays a critical role in delivering a hassle-free financial management experience. The database is developed in MySQL workbench to ensure that secure and efficient data handling. It stores essential user credentials. The identity is auto incremented. If users sign up, the user credentials are automatically saving in the database and using this data system will make the login and account creation process easy. The backend development of the project was developed using Java language in Android studio. The backend development has used algorithms and functions. The implementation of FinGuard is expected to enhance financial literacy and awareness and enable effective budgeting plan. Also, it expected reduce dependency on loans, promote long-term saving and investment habits and provide intelligent, proactive financial guidance. The system focused on making it easier to manage personal finances.

VIII. EVALUATION AND TESTING

The researcher has used three types of testing such as functional testing, usability testing, and application testing. The functional testing has manual testing with 32 testcases. All the features is the application are working properly. Usability testing was employed to check user-friendliness, intuitiveness and level of user satisfaction of the FinGuard application. The main aim was to check whether users could use the application easily and get things done without frustration or confusion. The researcher has used ten people to test the usability testing. A group of ten users, including students and young professionals, were asked to perform tasks such as follows. Also, feedback forms using a Likert scale (1 to 5) were used to collect their responses. The following are the key findings in usability testing.

TABLE I. USABILITY TESTING RESULTS

Usability Criteria	Average Rating (Out of five)
Ease of navigation	4.9
Ease Login	5.0
Woking features	4.9
Design and Aesthetic	4.7
Task completion efficiency	4.7
Clarity of Instructions	4.8
Overall user satisfaction	4.8

The application testing was tested to examine the application's performance, stability, and behavior on different devices and under different conditions. This includes crash testing, speed, responsiveness and compatibility testing. In usability testing, the researcher created a google questionnaire to gather feedback. The most interesting question is overall satisfaction. 90% of people say they are very satisfied with the project and the following is the pie chart for it.

IX. RESULTS AND DISCUSSION

The system performance was gauged in terms of speed, reliability, resource utilization and responsiveness. The final application was designed to run seamlessly on various android devices while delivering real-time data processing and a seamless user experience. For running the android application in android studio, the researcher used devices such as pixel 6a API 34 and pixel 6 pro API 33. But the final application is running on the device manager on pixel 6a API 34. The compile SDK version is 35 and the target SDK version is 34. The performance metrics are measured as follows.

A. *Emulator Boot time* - The application emulator launches within less than two seconds and displays the application with the starting page.

B. *Processing Data* - Financial activity creation and report generation occur virtually instantly within less than one second.

C. Prediction speed - Prediction generation time was less than one second using the model with average speed.

D. *Battery Utilization* - Moderate utilization, optimized through restrictions on background activity of the final application.

E. *Crash Reports* - No Application Not Responding to error conditions were encountered during the test time.

X. CONCLUSION

The project initiated to aid individuals in managing their day-to-day financial activities, including income, expenditure, savings and financial goals. The android application was developed using android studio and java and combined with a model to generate offline AI-based financial predictions. The user registration features, finance tracking, report generation, calendar reminders and chatbot support features were implemented successfully. The project was validated using functional testing, usability testing, performance testing and AI accuracy testing, all of which were satisfactory.

XI. BENEFITS OF PROJECT

The financial management application "FinGuard" provides the following significant benefits to the users of the application.

A. *Improved Financial Awareness* - The users can monitor their income and expenditure easily, which allows them to study their expenditure patterns and improve their budgeting.

B. *AI-driven Financial Forecasting* - The integrated predicts monthly spending and savings, allowing smart financial planning.

C. *Reminders and Alerts* - The users can set reminders for payment due dates and bills, which allow them to avoid late payments and stay organized.

REFERENCES

[1] A. Arun, "Legacy controls don't apply to new scammers," *Infosys BPM*, 2020. [Online]. Available: https://www.infosysbpm.com/blogs/bpm-analytics/predictive-modelling.html.

[2] M. Boyles, "7 financial forecasting methods to predict business performance," *Harvard Business School Online*, 2022. [Online]. Available: https://online.hbs.edu/blog/post/financial-forecasting-methods.

[3] F. Firmino da Silva and P. De Souza Paes, "Edição completa | Full version," *Âncora - Revista Latino-americana de Jornalismo*, vol. 8, no. 2, 2022, doi: https://doi.org/10.22478/ufpb.2359-375x.2021v8n2.62320.

[4] I. M. Pandey and R. K. Lele, *Financial Management*. South Asia Books, 1979.

[5] H. Kim, "A difference-in-differences analysis of the impact of government financial subsidies on mobile app usage: A natural experiment during COVID-19," *Applied Economics*, pp. 1–15, 2024.

[6] A. S. Manekar et al., "Smart expense tracker application using Naive Bayes," *Int. J. Adv. Res. Comput. Sci. Softw. Eng.*, vol. 12, no. 3, pp. 45–52, 2022.

[7] Central Bank of Sri Lanka, "Financial system," *CBSL*, 2023. [Online]. Available: https://www.cbsl.gov.lk/en/financial-system.

[8] S. Gowtham, "Financial system: What is it, components, functions & challenges," *Happay*, 2023. [Online]. Available: https://happay.com/blog/financial-system/.

[9] A. Putra and M. Alda, "Financial management information system design with business intelligence approach," *J. Dinda: Data Sci., Inf. Technol., Data Anal.*, vol. 5, no. 1, pp. 122–127, 2025.

[10] S. Schaltegger, M. Bennett, and R. Burritt, *Sustainability Accounting and Reporting*. Springer, 2006.