# Design of an Android-based Financial Recording and Investment Simulation Information System

**Gede Rizky Chandra Saputra[a1], I Made Sukarsa[a2], Putu Veda Andreyana[a3], Putu Wira Buana[a4], Ni Wayan Wisswani[b5]**

[a]Program Studi Teknologi Informasi, Fakultas Teknik, Universitas Udayana, Bali,
[b]Department of Informatics Management of Bali State Polytechnic, Bali
e-mail : [1]rizkycandra0426@gmail.com, [2]sukarsa@it.unud.ac.id, [3]putuveda@unud.ac.id,
[4]wbhuana@gmail.com, [5]wisswani@pnb.ac.id

### *Abstrak*

Pengelolaan keuangan dan investasi semakin penting di era digital, di mana banyak individu dan organisasi menghadapi kesulitan dalam mencatat dan mengelola keuangan dengan efektif. Untuk mengatasi masalah ini, dikembangkan sebuah aplikasi mobile yang menawarkan fitur pencatatan keuangan, simulasi investasi, simulasi pinjaman, dan pencatatan portofolio. Aplikasi ini dirancang dengan antarmuka yang mudah digunakan, sesuai dengan kebutuhan pengguna dalam mengelola keuangan secara lebih efisien. Aplikasi dibangun menggunakan Flutter untuk platform Android dan Laravel sebagai backend, dengan metode pengembangan *waterfall* yang memastikan setiap tahap pengembangan dilakukan secara sistematis, serta menggunakan arsitektur microservice untuk mendukung skalabilitas aplikasi. Pengujian dilakukan dengan metode *Black Box Testing* untuk menguji fungsionalitas aplikasi dan *Post-Study Usability Questionnaire* (PSSUQ) yang melibatkan 30 pengguna mengevaluasi tingkat kepuasan. Hasil pengujian menunjukkan bahwa aplikasi berfungsi dengan baik pada fitur-fitur utamanya, dengan skor rata-rata PSSUQ sebesar 1,9, yang lebih baik dari ambang batas kepuasan 2,57, menandakan tingkat kepuasan pengguna yang tinggi terhadap aplikasi ini.

*Kata kunci:* Flutter, Aplikasi Mobile, Pengelolaan Keuangan, Investasi, Portofolio

### *Abstract*

Financial management and investment have become increasingly important in digital era, where many individuals and organizations face challenges in effectively recording and managing their finances. Address this issue, mobile application has been developed, offering features such as financial recording, investment simulation, loan simulation, and portfolio tracking. The application is designed with user-friendly interface, tailored to meet users' needs for more efficient financial management. Built using Flutter for Android platform and Laravel for backend, application adopts waterfall development method to ensure systematic progress at every stage and employs microservice architecture to support scalability. Testing was conducted using Black Box Testing method to verify application functionality and Post-Study Usability Questionnaire (PSSUQ) involving 30 users to evaluate satisfaction levels. Results show application performs well on its key features, achieving an average PSSUQ score of 1.9, which is better than satisfaction threshold of 2.57, indicating a high level of user satisfaction with this application.

*Keywords : Flutter, Mobile App, Financial Management, Investment, Stock Portfolio*

## 1. Introduction

In the digital era and amidst the rapid advancement of information technology, financial management and investment oversight have become increasingly critical for both individuals and organizations [1]. Effective financial record-keeping and investment monitoring can enhance the efficient management of financial resources, identify spending trends, and optimize investment growth potential. However, many individuals still encounter difficulties in accurately

*Design of an Android-based Financial Recording and Investment Simulation Information System (Gede Rizky Chandra Saputra)*

157

tracking and recording their personal or business finances. Common challenges include monitoring daily expenditures, setting up budgets, or obtaining a comprehensive overview of their financial situation. On the other hand, managing investments is also complex, involving the tracking of investment portfolios, monitoring investment performance,and making informed investment decisions [2]. Therefore, there is an urgent need to develop an application that offers practical solutions for financial record-keeping and investment management. Such an application is expected to assist users in recording income and expenses, monitoring financial reports in real-time, providing insights into significant spending categories, and offering relevant investment advice [3]. Key features of this application include a calendar function to help users manage their daily finances, budgeting tools to control expenditures, investment simulations to aid in making informed investment decisions, and loan simulations to manage planned borrowings [4]. Additionally, the application will enable users to track stock portfolios to monitor investment performance in the stock market.

The development of this application aims to deliver a comprehensive, user-friendly, and efficient solution for managing personal or business finances and optimizing investment management [5]. The application will help individuals or organizations better manage their finances, maximize investment potential, and achieve long-term financial goals. By using this application, users will be able to monitor their financial health more effectively, plan their financial future, and take proactive steps toward achieving their financial objectives [6]. Central to the application is the goal of providing an intuitive and personalized experience for each user, tailored to their individual needs and preferences [7]. Furthermore, the application will be continuously updated and enhanced to address evolving needs and dynamics within the financial market. Thus, the application will not only serve as a practical tool for financial management but also as a reliable partner in users' financial journeys [8].

## 2. Research Method / Proposed Method

The system development methodology used in this research is the Software Development Life Cycle (SDLC). SDLC is used to describe the workflow involved in creating and developing a software system. The Waterfall model, first introduced by Winston Royce around 1970, is a traditional system development method and remains one of the most widely used approaches in software engineering. The Waterfall method was chosen because it provides a structured and systematic approach in developing this application. This waterfall method ensures that each stage, from requirements analysis, design, coding, testing, to maintenance, is carried out sequentially and completely completed before moving on to the next stage. The Waterfall model mandates that users complete one phase before moving on to the next, without any conditions. to review the previous phase. This model is often referred to as a sequential linear model or classic life cycle model. The Waterfall model provides a structured approach to software development, following a sequential progression through stages including requirements analysis, design, coding or implementation, testing, and maintenance [9].
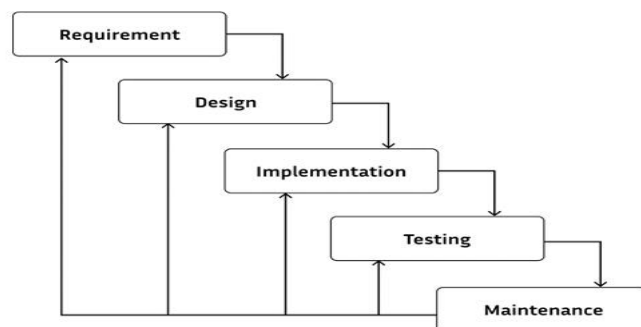


Figure 1. Research Flow Chart

Figure 1 is the stages of the waterfall model in the development of the Mobile-Based Finance and Investment Recording Information System. The following is an explanation of the stages of the waterfall model development.

## 2.1 System Overview

A financial record-keeping and investment simulation information system based on mobile platforms has a general system overview aimed at modeling the system and facilitating an understanding of how the system will be structured. The general system overview for this research can be seen in the following diagram.
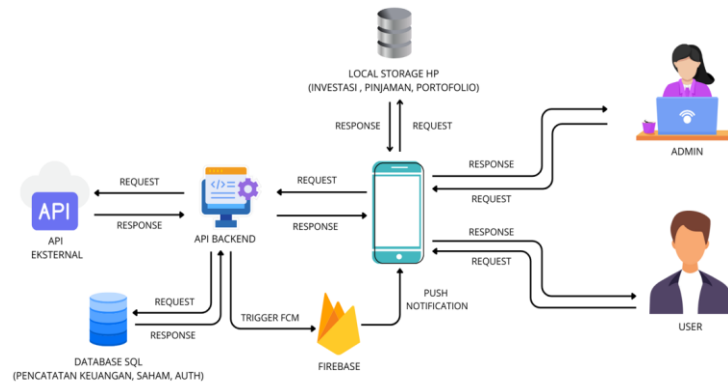


Figure 2 System Overview

Figure 2 is an overview of the system that has two roles or admin and user. Each role that will use this system must first be registered and logged into the system. After successfully logging in, the home menu will appear, then the user can use and access other features. Admin is responsible for verifying user accounts that register and checking the External API in case of interference. While the User can access all the features in the system where the user has full control of his account. The system also uses an External API which makes it easier to find out the existing Portfolio market. Firebase is used to send notifications about the latest information on the system. The system created is divided into 2 storages, namely using SQL Database and API while the other one uses HP Database Storage. The SQL Database is used for financial recording, stock and authentication features and the HP Storage Database is used for investment simulation features, loan simulation and portfolio recording.

## 2.2 Context Diagrams

A context diagram is a modeling tool used to represent the overall view of an information system. It depicts the entities involved, data flows, and processes within the system. The context diagram for the Mobile-Based Financial Record-Keeping and Investment System illustrates these components.
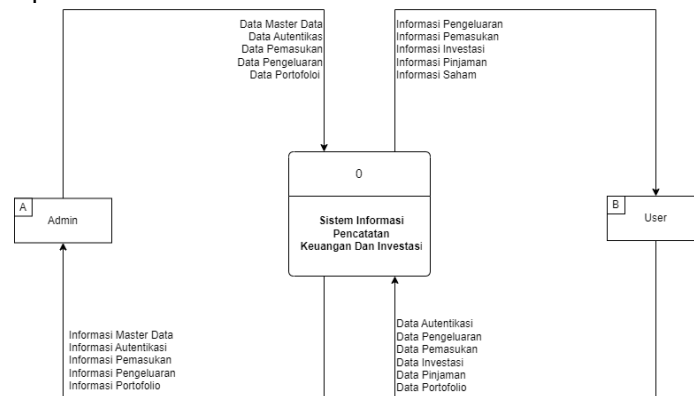


Figure 3 Context Diagrams

Figure 3 presents the context diagram for the Mobile-Based Financial Record-Keeping and Investment System. The context diagram displays two entities: Admin and User. Each entity has data flows to and from the system. In this mobile-based system adaptation, only these two entities, Admin and User, are utilized.

### 3. Literature Study

This research aims to develop an Android-based personal expense management application using the Kotlin programming language. One approach to address financial management challenges is by tracking expenses and income. By recording daily expenditures and earnings, individuals can better control and manage their finances. The outcome of this research demonstrates that the application aids users in managing their finances efficiently and is accessible anytime and anywhere [10].

This study addresses the issue of feature variation among existing personal finance applications available on Android. The researchers introduce an application that integrates features from various personal finance apps, such as speech-to-text input, recurring transactions, and installment calculations. Testing results indicate that the developed application effectively meets its objectives, with users rating the app an average of 4.54. This represents a positive step towards helping individuals manage their personal finances more efficiently and effectively [11].

The objective of this research is to understand how to build an Android-based financial and investment management application that assists individuals in managing their finances and investments. The methodology employed is the Waterfall model, with Android Studio as the development tool, Java as the programming language, SQLite for the database, and Unified Modeling Language (UML) for modeling and analysis. The resulting application includes features for tracking assets, planning expenditures, managing investments, and setting alarms for scheduled tasks [12].

This study aims to assist users in managing their finances via mobile devices, enabling effective management of both income and expenses. The application allows users to input daily income and expenditure data, which is then displayed on the application's main screen. Additionally, users can edit and delete entered data as needed and generate financial reports in the form of graphs and PDFs [13].

The objective of this research is to create an optimal combination of stock assets to form a portfolio and determine the proportion of funds for each stock using the Markowitz model. The methodology used is the Markowitz approach for constructing an optimal portfolio. Results indicate that out of fourteen tested stock samples, seven stocks were selected to form a candidate for the optimal portfolio based on the Markowitz model [14].

This research aims to develop a system that helps investors build diversified stock portfolios. The data processing method employed involves analyzing historical stock price data for stocks listed on the exchange. The outcome of this research is a system that provides recommendations for diversified stock portfolios based on historical data. Investors can input their preferences, such as desired risk levels, and the system will generate a suitable portfolio [15].

### 3.1 Financial Recording

Financial recording systems are used to manage an individual's personal finances. The primary purpose of such systems is to document all financial transactions, including both income and expenditures. The Mobile-Based Financial and Investment Recording System offers several benefits, including providing an overview of financial status and assisting in tracking income and expenses. This system features tools to help users, such as daily financial recording, calendar integration, and monthly views that allow users to see a comprehensive summary of their income and expenses. Additionally, the system includes an Expenditure Statistics feature, which provides statistical data, budgeting tools, and records to monitor past expenditures. It also offers a summary of total monthly expenditures and income, aggregating this data to calculate the remaining balance.

### 3.2 Investment Design

Investment design is the design of investment estimates that will be used by users to determine the value of investments that have been calculated previously. Investment design is a plan to achieve certain financial goals by investing. The Financial and Investment Recording Information System has features that can help users in designing investments later. Features that exist in the investment design on the Financial and Investment Recording Information

System are Lumpsum, Monthly, and Target. In the Lumpsum feature, which is an investment made in one go, here the user will fill in the initial investment data, time period (year), risk profile and estimated results. Furthermore, there is a Monthly feature, which is an investment made periodically every month, here it is the same as Lumpsum but the initial investment data is changed to periodic investments. Finally, the Target feature is the investment goal to be achieved, here the user will enter the target yield data, time period, risk profile and estimated funds to be paid / month.

### 3.3 Loan Design

Loan design in the form of designing an estimated loan value that will be used by users to determine the value of loan payments later. Loan design is a plan made to get a loan from a financial institution which will be adjusted to the needs and abilities of the borrower. The Financial and Investment Recording Information System has features that can help users in determining their loans. This feature has three interest rates which can be selected by the user later in order to determine the loan. The interest rates in question are fixed, annuity and declining interest rates. A fixed interest rate is an interest rate that remains fixed and unchanged for a certain period on a loan. Furthermore, there is an annuity interest rate, which is an interest rate whose payments are paid periodically in the same fixed amount over a certain period of time. Finally, a declining interest rate is an interest rate that refers to a method of calculating interest that decreases over time, while the principal amount of the loan that is still paid decreases each month.

### 3.4 Portofolio

Portfolios aim to assist users in recording the purchase and sale of a stock. A portfolio is a collection of stocks owned by an investor. Portfolios can be used to achieve various financial goals, such as to earn additional income or to build wealth. The more types of stocks that are in the portfolio, the more diverse the risks and potential profits that can be obtained later.

### 4. Result and Discussion

This section discusses the research findings related to the design process of the mobile-based waste management accountability information system. The system testing phase involves the use of black box testing techniques and Post-Study System Usability Questionnaire (PSSUQ) evaluations.

### 4.1 System Interface

The interface of the financial recording and investment simulation system is designed with a focus on ease of use, accuracy, and financial education for users. Additionally, it features real-time financial tracking, investment advice, and stock trading simulations, which are instrumental in managing users' finances and making informed investment decisions. Below is the representation of the financial recording and investment simulation system.
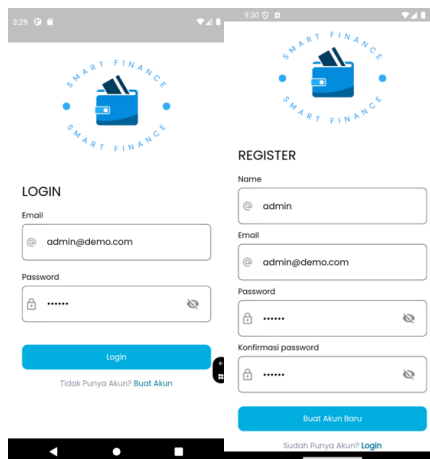
1) Login Interface



Figure. 4 Login Interface

*Design of an Android-based Financial Recording and Investment Simulation Information System (Gede Rizky Chandra Saputra)*

161

Figure 4 shows the interface implementation of the login page. In this interface, the user will first create an account on the register page and verify the email so that the account is registered. After that, the user can login using the previously created account and will enter the dashboard page.
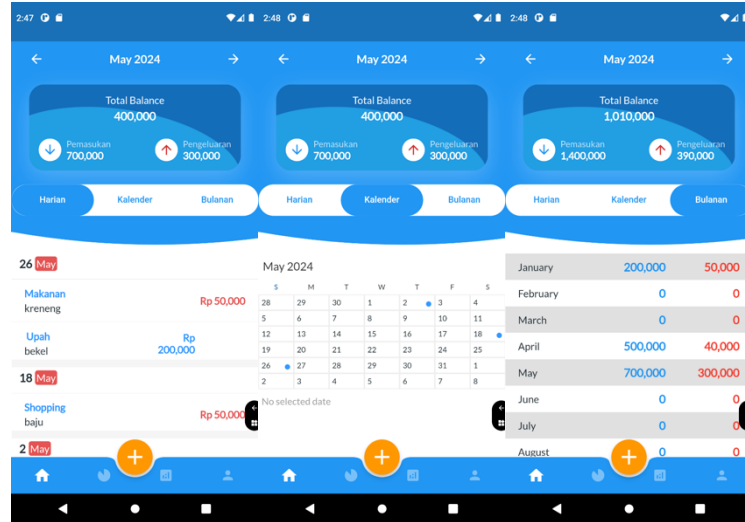
2) Dashboard Interface



Figure. 5 Dashboard Interface

Figure 5 shows the interface implementation of the dashboard page. This interface displays features that exist in financial records from daily, calendar and monthly. From each feature has a different function, such as daily and calendar features that prioritize displaying data from the last 1 month. While the monthly feature prioritizes the recap of the last 1 year.

3) Statistics Interface
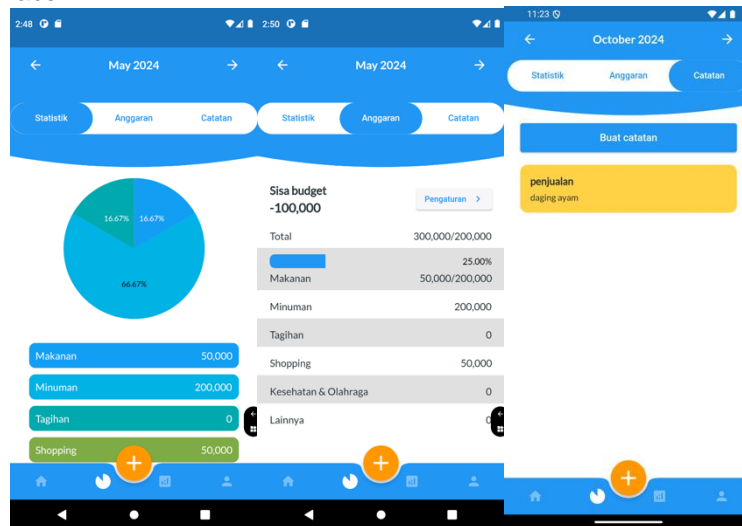


Figure 6. Statistics Interface

Figure 6 shows the interface implementation of the statistics page. This interface displays the existing features of the statistics page such as expense statistics, expense budget and notes. Each feature has a function to monitor expenses every month and record things that need to be remembered.

*Design of an Android-based Financial Recording and Investment Simulation Information System (Gede Rizky Chandra Saputra)*
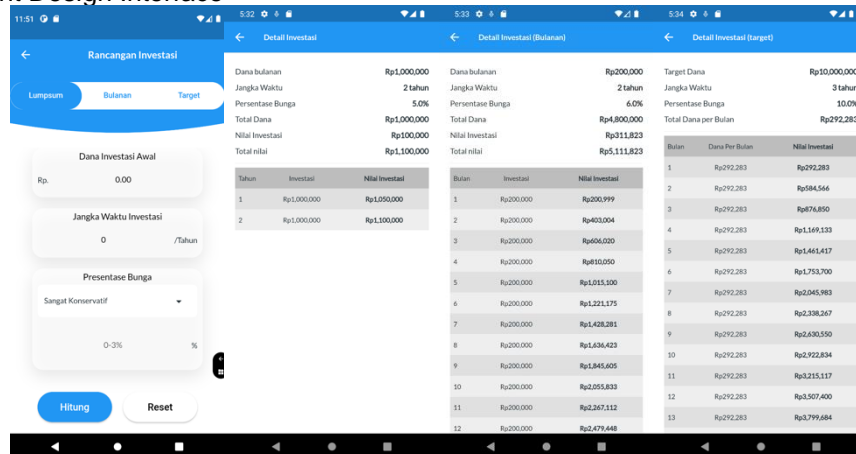
162

4)  Invesment Design Interface



Figure 7. Invesment Design Interface

Figure 7 shows the interface of the investment plan page. This interface has features such as lumpsum, monthly and target. Each feature has a function to simulate investments made by users with data that is not real-time. This feature helps users who want to learn investment easily and efficiently.
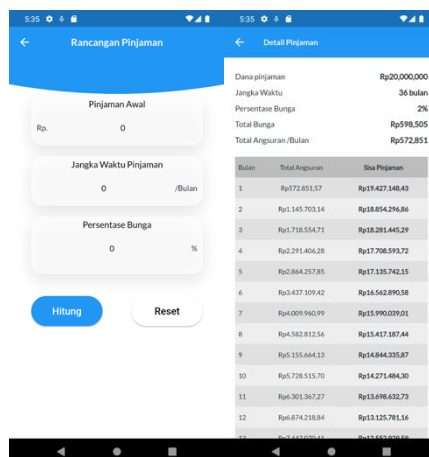
5)  Loan Design Interface



Figure 8. Loan Design Interface

Figure 8 shows the interface of the loan design page.  This interface has a fixed interest and declining interest feature that makes it easy to adjust to their needs. This feature can help users who want to borrow by displaying simulated data that is not real-time to make it easier for users later.

*Design of an Android-based Financial Recording and Investment Simulation Information System (Gede Rizky Chandra Saputra)*

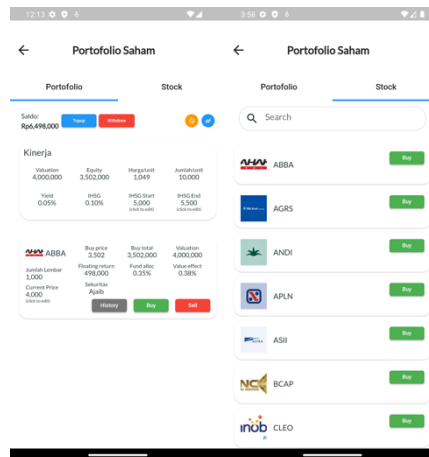163

6) Portofolio Interface



Figure 9. Portofolio Interface

Figure 9 shows the interface of the portfolio page. This interface displays the portfolio recording feature, where users who already have shares in other applications and want to see the performance of the shares they have. The function of this feature is to display the performance of each share that the user has and make 1 portfolio that will make it easier to monitor it.
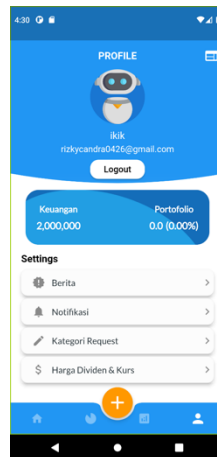
7) Profile Interface



Figure 10. Profile Interface

Figure 10 shows the interface of the profile page. This interface has several features such as news, reminder notifications, category requests and divide and exchange rates. Each feature has a different function to support user needs later.

**4.2 Testing Result**

System testing for the development of the Mobile-Based Financial Recording and Investment Simulation System employed two methods: Black Box Testing and the Post-Study System Usability Questionnaire (PSSUQ). The following is an explanation and the results of the system testing for the Mobile-Based Financial Recording and Investment Simulation System.

1) BlackBox Testing

The results of Black Box Testing focus on evaluating the outcomes based on test scenarios, without requiring in-depth technical knowledge of the system's implementation processes. Below are the results of Black Box Testing for 19 scenarios, as detailed in the table below.

*Design of an Android-based Financial Recording and Investment Simulation Information System (Gede Rizky Chandra Saputra)*

164

Table 1 BlackBox Testing Questionnaire Questions

| No | Questions |
|---|---|
| 1 | Email verification whether it can be used ? |
| 2 | Login Can the application be used? |
| 3 | Can you use Add Financial Transaction? |
| 4 | Can Edit Financial Transactions be used? |
| 5 | Can I use Delete Financial Transactions? |
| 6 | Can I use Add Budget? |
| 7 | Can I use the Investment Calculator? |
| 8 | Can the Loan Calculator be used? |
| 9 | Can I use Add Portfolio Funds? |
| 10 | Can Add Shares be used? |
| 11 | Can Edit Current Price be used? |
| 12 | Can I add initial & final IHSG? Can it be used? |
| 13 | Can I use Add Stock Dividends? |
| 14 | Can Add Deposit be used? |
| 15 | Can I use Add Deposit Dividends? |
| 16 | Can I use Selling Shares? |
| 17 | Can I use Add Shares in 2023? |
| 18 | Can you use Add Reminder? |
| 19 | Add Request Category? |

The table above is a list of questions contained in the BlackBox Testing Questionnaire which consists of 19 questions with multiple choices in the form of Success and Failure. A list of questions is used to obtain satisfactory results in previously created applications.

2)    Post-Study System Usability Questionnare

The results of the Post-Study System Usability Questionnaire (PSSUQ) were obtained from data collected via Google Forms and paper-based questionnaires. A total of 64 respondents participated in the study, including 44 identified as students and 20 from the general public. These respondents evaluated 16 scenarios described in the user evaluation questionnaire. The PSSUQ results are presented graphically in the following figures and tables.



| Responden | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 | P9 | P10 | P11 | P12 | P13 | P14 | P15 | P16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rata-rata | 2,2 | 1,8 | 1,98 | 1,72 | 1,75 | 2 | 2,1 | 1,8 | 1,98 | 1,89 | 1,91 | 1,8 | 1,8 | 1,7 | 1,89 | 1,72 |
| SysUse (1-6) | 1,9 | | | | | | | | | | | | | | | |
| InfoQual (7-12) | 1,9 | | | | | | | | | | | | | | | |
| InterQual (13-15) | 1,8 | | | | | | | | | | | | | | | |
| Overall (1-16) | 1,9 | | | | | | | | | | | | | | | |

Figure 11 PSSUQ Questionnaire Results

Figure 11 shows the results of testing using the PSSUQ version 3 method. The row labeled R(n) represents the responses provided by the participants to the questionnaire. The column labeled P(n) represents the questions from the PSSUQ. The obtained test results are then compared with the norms of PSSUQ version 3. The comparison of the test results with the PSSUQ version 3 norms can be seen in Table 2.

Table 2 PSSUQ Testing Result

| No | Sub-Scale | Lower Limit | Mean | Upper Limit | Results |
|---|---|---|---|---|---|
| 1 | **SysUse** | 2,79 | 3,02 | 3,24 | 1,9 |
| | Questions 1-6 | | | | |
| 2 | **InfoQual** | 2,28 | 2,49 | 2,71 | 1,9 |
| | Questions 7-12 | | | | |
| 3 | **InterQual** | 2,62 | 2,82 | 3,02 | 1,8 |
| | Questions 13-15 | | | | |
| 4 | **Overall** | 2,57 | 2,80 | 3,02 | 1,9 |
| | Questions 1-16 | | | | |

Table 2 presents a comparison between the norms of PSSUQ version 3 and the calculated responses from the participants. Based on the results obtained from both electronic and conventional questionnaires, all scale results are below the standard norm thresholds. This outcome indicates that the system is generally perceived as satisfactory by users, although there may still be some areas for improvement.

## 5. Conclusion

A financial recording application with investment simulation, loan simulation and portfolio recording features was successfully designed and implemented using Flutter and Laravel. Testing showed satisfactory results, with all features running smoothly despite some minor bugs, and a high level of user satisfaction based on a PSSUQ score of 1.9. In the future, the application can be improved by adding guides or tutorials to help new users, as well as expanding reach to the iOS platform so that more users can take advantage of this application. Additional features such as e-wallet integration to make financial management easier, a shopping receipt reader to automate data input, and monthly installment payment reminders to avoid late payments can also increase the convenience and benefits of the application for users.

## References

[1]    M. Sajali Harahap, R. Andrianto, D. Elok, C. Khoiriah, and B. Andika, "Pencatat Keuangan: Pengembangan Aplikasi Futter untuk Mencatat dan Mengelola Transaksi Keuangan," *Jurnal Penelitian Teknologi Informasi Dan Sains*, vol. 1, no. 3, pp. 64–75, 2023, doi: 10.54066/jptis.v1i3.814.

[2]    C. D. Setiawan and V. I. Dewi, "Analisis Pembentukan Portofolio Saham Optimal menggunakan Pendekatan Model Indeks Tunggal sebagai Dasar Keputusan Investasi," 2021.

[3]    L. R. Rinandiyana, D. L. Kusnandar, and A. Rosyadi, "PEMANFAATAN APLIKASI AKUNTANSI BERBASIS ANDROID (SIAPIK) UNTUK MENINGKATKAN ADMINISTRASI KEUANGAN UMKM," *Jurnal Bakti Masyarakat Indonesia*, vol. 3, no. 1, Jun. 2020, doi: 10.24912/jbmi.v3i1.8006.

[4]    R. Lukman Nugraha, F. I. Nuryoni, and Y. Adrianto, "STUDI KOMPARASI ALAT BANTU PENGELOLA KEUANGAN PRIBADI BERBASIS MOBILE COMPARATIVE STUDY MOBILE BASED PERSONAL FINANCIAL MANAGEMENT ASSISTANCE," 2019.

[5]    Amanita Novi Yushita, "PENTINGNYA LITERASI KEUANGAN BAGI PENGELOLAAN KEUANGAN PRIBADI," 2017.

[6]    D. K. Siregar and D. R. Anggraeni, "PENGARUH LITERASI KEUANGAN DAN PERILAKU KEUANGAN TERHADAP KEPUTUSAN INVESTASI MAHASISWA," *Bussman Journal : Indonesian Journal of Business and Management*, vol. 2, no. 1, pp. 96–112, Apr. 2022, doi: 10.53363/buss.v2i1.39.

[7]     E. Trivaika, M. Andri Senubekti, and A. Manajemen Informatika Dan Komputer HASS, "Perancangan Aplikasi Pengelola Keuangan Pribadi Berbasis Android," vol. 16, no. 1, 2022, [Online]. Available: https://journal.uniku.ac.id/index.php/ilkom

[8]     T. Permatasari and N. Santoso, "Pengembangan Sistem Informasi Akuntansi berbasis Web (Studi Kasus: Language Center Kediri)," 2022. [Online]. Available: http://j-ptiik.ub.ac.id

[9]     M. Tabrani and E. Pudjiarti, "PENERAPAN METODE WATERFALL PADA SISTEM INFORMASI INVENTORI PT. PANGAN SEHAT SEJAHTERA," Online, 2017.

[10]    R. F. Maulian and R. Juwono, "ANDROID-BASED MOBILE APPLICATION DEVELOPMENT EXPENSIFY: PERSONAL EXPENSE MANAGER," *IT FOR SOCIETY*, vol. 07, no. 01, 2022.

[11]    N. Aisyah *et al.*, "STUDI KOMPARASI ALAT BANTU PENGELOLA KEUANGAN PRIBADI BERBASIS MOBILE DAN ANDROID (COMPARATIVE STUDY OF PERSONAL FINANCIAL MANAGEMENT TOOLS BASED ON MOBILE AND ANDROID)," 2021.

[12]    R. Bangun, A. Keuangan, D. Investasi, B. Android, D. I. Batam, and Y. Siyamto, "Computer Based Information System Journal," *CBIS JOURNAL*, vol. 06, no. 02, 2018, [Online]. Available: http://ejournal.upbatam.ac.id/index.php/cbishttp://ejournal.upbatam.ac.id/index.php/cbis

[13]    S. Susilowati and A. R. Sigit, "Design and Build Daily Android-Based Financial Applications," *International Journal of Information System & Technology Akreditasi*, vol. 3, no. 2, pp. 159–165, 2020.

[14]    N. P. E. C. Setyawati and G. M. Sudiartha, "PEMBENTUKAN PORTOFOLIO OPTIMAL MENGGUNAKAN MODEL MARKOWITZ," *E-Jurnal Manajemen Universitas Udayana*, vol. 8, no. 7, p. 4213, Mar. 2019, doi: 10.24843/ejmunud.2019.v08.i07.p08.

[15]    R. A. Nur, D. Saepudin, and R. F. Umbara, "PEMILIHAN PORTOFOLIO SAHAM DENGAN MENGGUNAKAN WEIGHTED FREQUENT ITEMSETS," *Indonesian Journal on Computing (Indo-JC)*, vol. 3, no. 2, p. 91, Sep. 2018, doi: 10.21108/indojc.2018.3.2.239.

[16]    K. Mardiawati and R. Adawiyah, "Jurnal Nasional Teknologi dan Sistem Informasi Attribution-ShareAlike 4.0 International. Some rights reserved," 2022, doi: 10.25077/TEKNOSI.v8i3.2022.025-033.

[17]    I. Kadek, K. Sanjaya, P. Wira Buana, and I. M. Sukarsa, "Designing Mobile Transactional Based Restaurant Management," 2019. [Online]. Available: www.ijceit.org

[18]    K. Wasilewski and W. Zabierowski, "A comparison of java, flutter and kotlin/native technologies for sensor data-driven applications," *Sensors*, vol. 21, no. 10, May 2021, doi: 10.3390/s21103324.

[19]    R. Puspita Sari, S. Rahmayuda, J. Sistem Informasi, F. Mipa, U. Tanjungpura Jalan ProfDrH Hadari Nawawi, and P. Telp, "Coding : Jurnal Komputer dan Aplikasi IMPLEMENTASI FRAMEWORK FLUTTER PADA SISTEM INFORMASI PERPUSTAKAAN MASJID (Studi Kasus: Masjid di Kota Pontianak)," 2022.

[20]    S. N. Yanti and E. Rihyanti, "Penerapan Rest API untuk Sistem Informasi Film Secara Daring," *Jurnal Informatika Universitas Pamulang*, vol. 6, no. 1, p. 195, Mar. 2021, doi: 10.32493/informatika.v6i1.10033.

[21]    R. Fikri, I. Ratna, and I. Astutik, "SISTEM INFORMASI SIMPAN PINJAM BERBASIS ANDROID PADA INSTALASI GAWAT DARURAT RSUD SIDOARJO," 2017.

[22]    P. Yogie, A. Nirmala, I. Made, S. Putra, A. A. Kompiang, and O. Sudana, "PENGUJIAN BLACK BOX PADA SISTEM TERINTEGRASI PEMBAYARAN UANG KULIAH PADA UNIVERSITAS X DENGAN METODE EQUIVALENCE PARTITIONS," 2021.

[23]    R. Suwandy and S. Hadini Marpaung, "Evaluasi Pengalaman Pengguna dengan Menggunakan Post Study System Usability Questionnaire (PSSUQ) Perpustakaan Digital Universitas Mikroskil," 2022, [Online]. Available: https://www.mikroskil.ac.id/pustaka.

[24]    Sukarsa, I. M., Buana, P. W., Utama, I, P, A., (2022). EVALUASI USABILITY DAN PERBAIKAN ANTARMUKA UNTUK MENINGKATKAN USER EXPERIENCE MENGGUNAKAN METODE USABILITY TESTING(STUDI KASUS : APLIKASI WARGA BALI). Jurnal Teknologi Informasi dan Ilmu Komputer (JTIIK), 9(5),https://doi.org/10.25126/jtiik.202295408.

[25]  Pradipta, O. A., Sukarsa, I. M., Dharmaadi, I, P, A., (2022). Pengambangan uI Aplikasi Mobile Konsultasi Karir Menggunakan Metode Lean Ux. JITTER-Jurnal Ilmiah Teknologi dan Komputer, 3(1)

[26]  Teguh Prasetyo,R, Piarsa, I.N., Sukarsa,I.M. (2024). RANCANG BANGUN SISTEM INFORMASI PENYEDIAAN SERTA PEMESANAN PAKET TOUR DAN GUIDE DENGAN MODEL LAYANAN SAAS BERBASIS MOBILE. Jurnal Review Pendidikan dan Pengajaran, Volume 7 Nomor 3, 2024.