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Financial Management System for Final-Year University Students Implementing a Rule-Based Method on the Android Platform

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Abstract

Final-year students face significant financial challenges due to limited income and low financial literacy. This often leads to uncontrolled spending, lack of awareness about financial habits, and imbalanced income and expenses. This study proposes a rule-based financial management system to help students organize, monitor, and analyze their finances. The analysis shows that students' main expenses are food, transportation, and housing, with financial risks arising from irregular financial recording and overspending. The proposed system includes features like expense categorization, budget limits, monthly reports, notifications for unusual spending, and reminders to record finances. Applying a rule-based approach, the system offers personalized recommendations, such as budget control for specific categories and early warnings for disproportionate expenses. This application aims to improve financial awareness, help students prioritize spending, and reduce financial risks. It also serves as a financial education tool to support students in achieving financial stability as they transition into professional life.

Keywords: *Rule-Based System, Financial Management, Student Financial Literacy, Financial Literacy.*

1. Introduction

Finance is a critical aspect of daily life, encompassing money management, expenditures, savings, and investments. On an individual level, managing finances is a crucial skill for the general public[1]. Final-year university students working on their graduation theses face various financial challenges. During this period, they must manage expenses related to academic needs, such as completing their theses, transportation costs, and career preparation, often relying on limited income from parental allowances or part-time jobs [2]

One significant challenge is the lack of awareness among students regarding the importance of recording and analyzing personal finances. Research conducted by Ratna Sari and Listiadi indicates that low financial literacy among students often leads to difficulties in budgeting and setting financial priorities [3]. Additionally, studies by Putra and Syaiful Akbar reveal that students generally lack efficient financial recording systems, making it difficult to control expenses, especially during academic or social pressure periods. Manual recording methods are insufficient for real-time financial monitoring, often leading to impulsive and unplanned financial decisions [4]. Previous research highlights the need for innovative strategies to assist students in managing their finances. Mulyani and Ismantohadi proposed a rule-based approach to personal financial management. This approach provides a customizable method for categorizing expenses, setting budget limits, and offering tailored saving tips. By analyzing spending patterns, users can better understand financial behaviour [5][6].

As a solution, this study recommends developing an Android-based Financial Management System application using a rule-based method. The application aims to help students record expenses, analyze financial patterns, and provide recommendations tailored to their specific needs. With an easy-to-use user interface and automatic analysis functions, this application aspires to become an effective tool in assisting students in making prudent financial decisions. This study's novel contribution is applying a rule-based method for personal financial management tailored to the needs of final-year students. This application functions as a tool for tracking daily transactions and as a source of financial literacy that raises user awareness about the importance of financial stability. Focusing on final-year students, this research aims to enhance financial management skills academically and during the transition to professional life.

2. Literature Review

2.1. Rule-Based System

A rule base is called an Expert System because it relies on rules to convey knowledge. It is a system designed to store and manage knowledge that can be used to solve various problems. Simply put, a rule base is software that utilizes expert knowledge in the form of specific rules to address particular issues [7]. This method employs a direct approach with simple rules encompassing all knowledge of a particular problem. These rules are then transformed into if-then statements of data, assertions, and initial information [8]. These rules are easy to use and understand; however, since they are not designed for learning processes, they cannot create or modify existing regulations or generate new ones [9]. In a rule-based system, decision-making or problem-solving relies on two main components: the antecedent and the consequent. The antecedent is the part of the rule that states the condition or initial requirement, usually beginning with the word IF. This condition describes a specific situation that must be met for the system logic to proceed. Conversely, the consequent is the part that explains the action or result to be applied if the condition is proven true, beginning with the word THEN.

For example, a system rule might state: IF expenses exceed the monthly budget, THEN notify the user. The system can act logically and systematically based on the conditions given by this structure.

This system operates based on simple logic that connects a condition to a specific action. When a condition is met, the system automatically executes the predetermined action.

For example:

Condition: If the total daily expenses exceed the predefined limit.

Action: The system will send a notification to the user.

1. Basic Rule-Based Formulas
   a. The formula for a single rule:
      IF (Condition) THEN (Action)
   b. Formula for multiple rules with combined conditions:
      IF (Condition 1) AND/OR (Condition 2) THEN (Action)
2. Condition Formulas with Logical Operators
   Condition formulas often use logical operators such as
   AND: Both conditions must be actual.
   OR: At least one condition must be actual.
   NOT: Reverses the condition.
   General formula:

$$\text{Action} = \begin{cases} \text{Action A, if Condition 1 AND Condition 2} \\ \text{Action B, if Condition 3 OR Condition 4} \\ \text{Default Action, if all conditions are false} \end{cases} \quad (1)$$

3. Rule-Based Formula in Finance
   Managing Daily Expenses:

$$Action = \begin{cases} \text{True, if daily expenses} > \text{daily limit} \\ \text{False, if daily expenses} < \text{daily limit} \end{cases} \quad (2)$$

With this rule, the system monitors user input data (such as the amount of expenses) in real time and evaluates whether the data meets the predefined conditions. If the condition is actual, the system will take action according to the designed response.

This process ensures that users receive timely and relevant responses or information without manual oversight. These rules form the foundation for creating a responsive and efficient system. This method is widely used in various fields, including medical diagnosis, product recommendations, and financial management, as it provides a structured and transparent approach to problem-solving.

The rules in a rule-based system are typically easy to understand, even for individuals who are not experts in a particular field, enabling faster and more efficient system development. The knowledge within such systems can be updated by adding new rules without altering the system's core structure, offering the flexibility crucial in an ever-evolving world.

2.2. Financial Management System

Financial management encompasses all activities related to acquiring, financing, and managing assets with comprehensive objectives. When managing personal finances, everyone knows the goals they want to achieve. Therefore, individuals should utilize financial resources optimally to reach their objectives.

Financial management is a reality faced by every individual in their daily lives; people must manage their finances effectively to balance income and expenses, meet their needs, and avoid financial difficulties. With proper financial management, you can steer clear of becoming trapped in financial failure[10]

Several studies have highlighted that a significant portion of the population remains unaware of financial management's crucial role in their economic well-being. This lack of awareness is often attributed to limited access to practical financial recording tools. Carrying conventional financial storage media is inefficient for individuals with a mobile lifestyle who frequently move from place to place. One of the main reasons many people fail to manage their finances effectively is the lack of time to think about and plan their finances.

3. Research Methods

This research was conducted among final-year students at Universitas Malikussaleh, specifically in the Faculty of Engineering, Informatics Engineering Study Program, Class of 2020. The study involved distributing questionnaires to final-year students to identify the outcomes of the issues and provide recommendations for financial management among students.

3.1. Research Steps

The steps of the research are as follows:

1. Data Collection
   This stage will explain how the data collection process is carried out for the research, such as the type of data used in the study and how it is utilized. In this research, the data used is
2. Data Processing Method
   The data processing method in this research includes the steps of processing and preparing the questionnaire data from final-year students in the Informatics Engineering Study Program before applying it to the Rule-based system method. This data processing aims to ensure the data quality used to produce accurate and relevant results. Data processing is carried out using software such as Excel and Google Spreadsheets.
3. System Design
   The system design uses context diagrams, data flow diagrams (DFD), entity relationship diagrams (ERD), and flowcharts. This design will aid in the application development process using programming languages. This stage is conducted to provide an overview of the system that will be designed to solve the problem.
4. System Implementation
   System implementation is the process of developing the application using programming languages. In this study, the developed Android-based application uses the Kotlin programming language and Android Studio as the Integrated Development Environment (IDE) for application development.
5. System Testing
   At this stage, trials and program improvements are carried out to ensure the system operates properly according to the design. The testing process involves several stages of testing and debugging to identify potential issues and ensure that the "Student Saving" application runs optimally.

4. Results and Discussion

4.1. Research Results

In this study, the author uses the Rule-Based System method to understand the financial management habits of final-year students in the Informatics Engineering program of the 2020 cohort. Through this method, it will be possible to determine how students manage their finances based on their habits and financial management practices according to the predefined variables. These variables include gender, age, monthly income, primary source of income, monthly expenses, most significant expenditure, frequency of recording income and expenses, and common difficulties.

a. System Analysis
   System Analysis is breaking down an entire information system into its constituent elements to assess problems, potentials, constraints, and anticipated needs to propose changes [11]. This analysis stage is conducted after system planning and before moving on to the design stage. It is a crucial phase because failure at this point can lead to data errors in the subsequent stages.
b. System Design
   The system being developed will be planned using the Unified Modeling Language (UML) methodology to represent how the system will function visually. This aims to facilitate understanding and implementation of the system into practice [12].
   Context Diagram and DFD (Data Flow Diagram) are used for system design. This design will assist in the development process of the application using a programming language [13]. This stage is conducted to provide an overview of the system that will be designed to solve the problem.
c. Problem Analysis
   One of the common issues faced is that final-year students struggle with managing their finances, primarily due to the lack of a structured and easily accessible recording system[14]. During their final academic year, expenses such as thesis costs, internships, and career preparation increase, while many students still rely on inconsistent manual records. A lack of financial education further hinders their ability to create budgets and track expenses. Therefore, a simple financial recording application is needed, enabling students to easily record daily income and expenses and generate automatic financial reports. This application will help them manage their finances more effectively[15].
d. System Requirements
   System requirements are the factors the system needs and are essential for software development to ensure that the software aligns with its intended purpose and objectives[16].

1. Establishing Rules for Student Financial Analysis
   Based on the data analysis, the following rules can be designed to guide student financial management effectively.
   a. Income and Expense Categories
      1) For students in the low-income category (IDR 1,000,000 - IDR 2,000,000), the system can recommend a maximum spending limit for essential categories such as transportation and food (50% of total income).
      2) The system should monitor if discretionary spending, such as entertainment, exceeds 10% of total expenses.
   b. Recording Requirements
      To address the issue of students not recording their finances, the system can implement rules that remind users to record their income and expenses monthly or when major transactions occur.
2. Financial Difficulties
   Address issues like too many unexpected expenses or unclear spending patterns. The system can provide alerts for transactions that deviate significantly from usual spending trends.
3. System as a Financial Reminder for Students
   Given the importance of tracking monthly financial reports, the system can act as an economic control tool through the following reminders
4. Alerts for Unexpected Expenses
   Notify users if spending on unexpected categories rises significantly, such as a sudden increase in transportation or food expenses.

5. Regular Recording Reminders
   For users who rarely record expenses, the system can send weekly reminders or notifications once expenses reach 70% of their monthly income.
6. Monthly Financial Reports
   Send a summary report highlighting the largest expense categories and adherence to the budget plan.
7. Effectiveness of the Financial Management System
   a. Improved Awareness of Spending
      The system addresses the issue of students not knowing where their money is spent. Detailed expense tracking and monthly reports enhance transparency.
   b. Budget Management
      Features like income and expense tracking and budget adherence reminders allow students to manage their finances better.
   c. Reduction in Unexpected Expenses
      Alerts for out-of-budget or unexpected spending categories help students reduce unnecessary financial burdens.
   d. Structured Recording Features
      Categorizing and organizing expenses helps students identify dominant spending areas, such as food and transportation, and make better financial decisions.

This system schematic diagram illustrates the workflow of a rule-based system in managing student financial data[17]. The process begins with data collection through questionnaires and literature, which is then used to form rules or a rule base. These rules are the foundation for analyzing and processing the financial data of students entered into the system. Once the student data is processed, the system calculates to determine if the student's Balance has reached a certain threshold (referred to as the trash hole). If the Balance meets this criterion, the system sends a reminder to the user. If not, the process stops. This diagram shows how the system operates to ensure financial management follows the established rules [18].

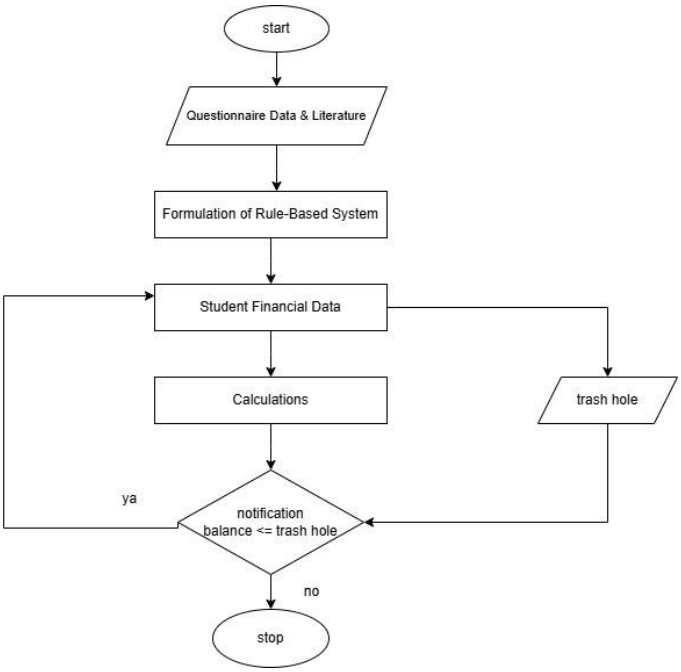

Fig 1. System Scemathic

4.1 System Performance Testing

Table 1. Rules Code

Code	Conditional	information
A1	Income	< Rp. 1.000.000
A2		Rp. 1.000.000 – 2.000.000
A3		Rp. 2.000.000 – 3.000.000
A4		> Rp. 3.000.000
A5	expense	< Rp. 1.000.000
A6		Rp. 1.000.000 – 2.000.000
A7		Rp. 2.000.000 – 3.000.000
A8		> Rp. 3.000.000
A9	Biggest expense	boarding house rental
A10		Food
A11		transportation
A12		Trips

A13	Recording time	Every Day
A14		Every week
A15		Every Month
A16		Every year
A17		Never
A18	Difficulty managing finances	Yes
A19		No
A20	Difficulties that are often experienced	Don't know where the money went
A21		Not enough money until the end of the month
A22		Too many unexpected expenses

The table above presents a list of codes designed to facilitate the formulation of rules based on the financial management habits of final-year students. These codes serve as a structured, standard reference to identify, classify, and formulate recurring financial behaviours.

Table 2. Rules

No	conditional	Financial risk
1	Income of 1-2 million, expenses of 1-2 million, a most significant expense for food, never tracking finances, difficulty in managing finances, unaware of where the money goes, not enough money until the end of the month, too many unexpected expenses.	Yes
2	Income of 1-2 million, expenses of 1-2 million, a most significant expense for food, tracks finances every month, difficulty in managing finances, not enough money until the end of the month, too many unexpected expenses.	Yes
3	Income of 1-2 million, expenses of 1-2 million, the most significant expense for room rent, never tracking finances, difficulty managing finances, too many unexpected expenses.	Yes
4	Income of 1-2 million, expenses of 1-2 million, the most significant expense for room rent, tracks finances every month, difficulty in managing finances, unaware of where the money goes, not enough money until the end of the month, too many unexpected expenses.	Yes
5	Income of 1-2 million, expenses of 1-2 million, the most significant expense for transportation, never tracking finances, difficulty in managing finances, not enough money until the end of the month.	Yes
6	Income of 1-2 million, expenses of 1-2 million, a most significant expense for transportation, tracks finances every month, difficulty in managing finances, not enough money until the end of the month, too many unexpected expenses.	Yes
7	Income of 2-3 million, expenses of 2-3 million, the most significant expense for room rent, never tracking finances, difficulty in managing finances, unaware of where the money goes, too many unexpected expenses.	Yes
8	Income of 1-2 million, expenses of 2-3 million, the most significant expense for room rent, never tracking expenses, difficulty in managing finances, too many unexpected expenses.	Yes
9	Income less than 1 million, expenses of 1-2 million, the largest expense for food, never tracks finances, difficulty in managing finances, unaware of where the money goes, too many unexpected expenses, not enough money until the end of the month.	Yes

The table above shows several rules derived from the financial management habits of final-year students based on their patterns. These rules reflect the most commonly observed behavioural trends and guide financial decision-making.

The following is a rule based on the table above:

1. Rule 1 : IF (A2 AND A6 AND A10 AND A17 AND A18 AND A20 AND A21 AND A22) THEN Financial risk
2. Rule 2 : IF (A2 AND A6 AND A10 AND A15 AND A18 AND A21 AND A22) THEN Financial risk
3. Rule 3: IF (A2 AND A6 AND A9 AND A17 AND A18 AND A22) THEN Financial risk
4. Rule 4: IF (A2 AND A6 AND A9 AND A15 AND A18 AND A20 AND A21 AND A22) THEN Financial risk
5. Rule 5: IF (A2 AND A6 AND A11 AND A17 AND A18 AND A21) THEN Financial risk
6. Rule 6: IF (A2 AND A6 AND A11 AND A15 AND A18 AND A21 AND A22) THEN Financial risk
7. Rule 7: IF (A3 AND A7 AND A9 AND A17 AND A18 AND A20 AND A22) THEN Financial risk
8. Rule 8: IF (A2 AND A7 AND A9 AND A17 AND A18 AND A22) THEN Financial risk
9. Rule 9: IF (A1 AND A6 AND A10 AND A17 AND A18 AND A20 AND A21 AND A22) THEN Financial risk

Below are the formulas for determining the rules:

1. First Formula

   Remaining Balance = ∑ Income - ∑ Expenses ……. (3)

   This formula calculates the remaining Balance after adding the total income and subtracting the total expenses. In a financial context, the Remaining Balance represents the amount of funds still available after all income sources are summed up and all expenses are subtracted.

   Below is a manual calculation using the formula above:

   1. Rp. 280.000 = Rp. 500.000 – Rp. 220.000
   2. Rp. 1.809.000 = Rp. 1.500.000 – Rp. 309.000
   3. Rp. 450.000 = Rp. 1.500.000 – Rp. 1.050.000
   4. Rp. 705.000 = Rp. 1.000.000 – Rp. 295.000
   5. Rp. 930.000 = Rp. 1.500.000 – Rp. 570.000
   6. Rp. 292.000 = Rp. 500.000 – Rp. 208.000
   7. Rp. 462.000 = Rp. 1.000.000 – Rp. 538.000
   8. Rp. 240.000 = Rp. 1.000.000 – Rp. 760.000
   9. Rp. 712.000 = Rp. 1.000.000 – Rp. 288.000
   10. Rp. 1.046.000 = Rp. 1.500.000 – Rp. 454.000
   11. Rp. 872.000 = Rp. 1.500.000 – Rp. 628.000
   12. Rp.640.000 = Rp. 1.000.000 – Rp. 360.000
   13. Rp. 662.000 = Rp. 1.000.000 – Rp. 338.000
   14. Rp. 322.000 = Rp. 600.000 – Rp. 278.000
   15. Rp. 1.030.000 = Rp. 1.500.000 – Rp. 470.000

2. Second Formula

   $$\text{Daily Estimate} = \frac{\text{Remaining Balance}}{(\text{Number of Days} - \text{Date})} \quad \text{.....(4.2)}$$

   This formula estimates how much money can be spent each day, considering the remaining Balance and how many days are left in the specified period. This formula is essential in budget management or short-term financial planning, especially when you want to ensure that the available funds are sufficient to last until the end of the month.

   Below is a manual calculation using the formula above:

$$\text{Daily Estimate} = \frac{Rp.280.000}{(31\ \text{day} - 7)} = Rp.11.5000$$

$$\text{Daily Estimate} = \frac{Rp.1.809.000}{(31\ \text{day} - 7)} = \text{Rp.}\ 45.000$$

$$\text{Daily Estimate} = \frac{Rp.450.000}{(31\ \text{day} - 7)} = \text{Rp.}\ 18.000$$

$$\text{Daily Estimate} = \frac{Rp.705.000}{(31\ \text{day} - 7)} = \text{Rp.}\ 29.000$$

$$\text{Daily Estimate} = \frac{Rp.787.000}{(31\ \text{day} - 7)} = Rp.32.000$$

$$\text{Daily Estimate} = \frac{Rp.930.000}{(31\ \text{day} - 7)} = Rp.232.000$$

$$\text{Daily Estimate} = \frac{Rp.292.000}{(31\ \text{day} - 7)} = \text{Rp.}\ 12.000$$

$$\text{Daily Estimate} = \frac{Rp.462.000}{(31\ \text{day} - 7)} = Rp.19.000$$

$$\text{Daily Estimate} = \frac{Rp.240.000}{(31\ \text{day} - 7)} = \text{Rp.}\ 10.000$$

$$\text{Daily Estimate} = \frac{Rp.712.000}{(31\ \text{day} - 7)} = \text{Rp.}\ 29.000$$

$$\text{Daily Estimate} = \frac{Rp.1.046.000}{(31\text{ day} - 7)} = \text{Rp. } 43.000$$

$$\text{Daily Estimate} = \frac{Rp.872.000}{(31\text{ day} - 7)} = \text{Rp. } 36.000$$

$$\text{Daily Estimate} = \frac{Rp.640.000}{(31\text{ day} - 7)} = \text{Rp. } 26.000$$

Based on the two formulas explained earlier, the Remaining Balance and Daily Estimate, we can establish effective rules to manage the budget in a more structured and measurable way. These rules are designed to help individuals or organizations plan their expenses and ensure that the available funds are sufficient to last until the end of the specified month.
Rule

If Daily Estimasi< Rp. 50.000

Then

"Financial Risk"

Else

If Daily Estimasi >Rp. 50.000

Then

"Financially Secure"

In the table below, calculations are performed based on two main formulas aimed at managing finances in a more structured manner.

Table 3. Daily Estimate Analysis

ID	Income	Remaining Balance	Remaining Balance ÷ Remaining Days.	Description
7	Rp. 500.000	Rp.280.000	Rp.11.000	*Financial* Risk
9	Rp. 1.500.000	Rp. 1.809.000	Rp. 45.000	*Financial* Risk
70	Rp. 1.500.000	Rp. 450.000	Rp. 18.000	*Financial* Risk
94	Rp. 1.000.000	Rp. 705.000	Rp. 29.000	*Financial* Risk
232	Rp. 1.000.000	Rp. 787.000	Rp. 32.000	*Financial* Risk
248	Rp. 1.500.000	Rp.930.000	Rp. 232.000	*Financial* Secure
249	Rp. 500.000	Rp. 292.00	Rp. 12.000	*Financial* Risk
252	Rp. 1.000.000	Rp. 462.000	Rp. 19.000	*Financial* Risk
253	Rp. 1.000.000	Rp. 240.000	Rp. 10.000	*Financial* Risk
254	Rp. 1.000.000	Rp. 712.000	Rp. 29.000	*Financial* Risk
255	Rp. 1.500.000	Rp. 1.046.000	Rp. 43.000	*Financial* Risk
256	Rp. 1.500.000	Rp. 872.000	Rp.36.000	*Financial* Risk
257	Rp. 100.000	Rp.640.000	Rp. 26.000	*Financial* Risk

4.2. System Implementation

Implementation is the stage where the system is ready to operate in its actual environment, allowing us to determine whether the created system aligns with the planned design. In this software implementation phase, the program's workings are explained by presenting the system or application interface that has been developed. Below are the results of the system implementation created by the author, as follows:

a. Display on the Login Page
   Display the user login page. Some information that must be entered includes email and password. If not registered, users can sign up first.

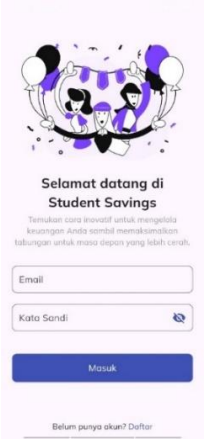

Fig 2. Login Page

This page is designed to verify the user's identity before granting access to certain features or information within the system.

b. Transaction History Page

This page is an information hub displaying the user's complete transaction history. Users can view a comprehensive record of all financial transactions on this page, including income and expenses.

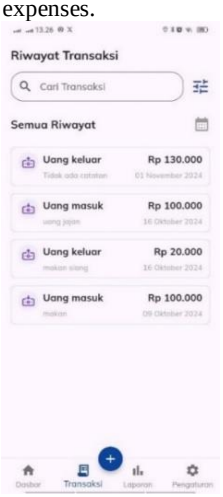

Fig 3. History Page

c. Recording Page

This page displays records of income and expenses logged, including the transaction date, amount, and additional notes. The user fills in the fields for category, payment method, date, amount, and notes (optional), then clicks Save to store the data in the transaction history.

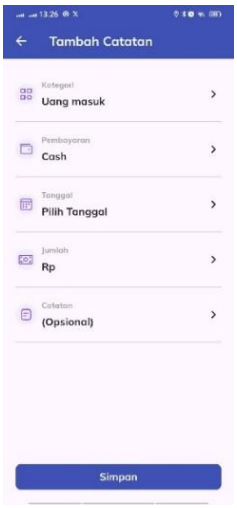

Fig 4. Recording Page

d. Financial report page

This page provides a financial summary, including daily, weekly, and monthly income and expenses. Each transaction displays details such as the date, category, and amount, making it easier for users to review cash flow, identify financial patterns, and distinguish between essential needs and wants.

Fig 5. report page

e. Balance Reaches Limit Notification

This notification automatically appears when the user's Balance falls below IDR 100,000, warning that the Balance is approaching the minimum threshold of IDR 50,000. The notification is designed as an effective visual reminder to encourage users to be more cautious in managing their finances, considering increasing income or reducing expenses. With this notification, users can prevent their Balance from reaching a critical level and stay more vigilant in managing their finances to avoid future issues.

Fig 6. Balance Reaches Limit Notification

f. Notification Exceeding Limit

This notification serves as a reminder for users to add a new income entry. If the user has not done so, they will not be able to record new expenses because the remaining limit in the application is only IDR 50,000.

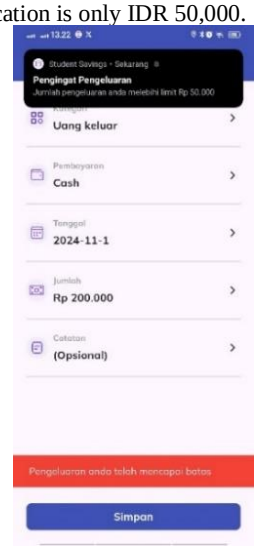

Fig 7. Notification Exceeding Limit

4.3. Black Boc Testing

Black box testing is conducted to evaluate the system's functionality without examining its internal structure or source code. This testing will be performed on final-year students of the Informatics Engineering program to ensure that the application functions properly across various devices. The primary goal of black-box testing is to verify that all application features work according to user needs and specified requirements and identify bugs or functional issues that may not have been detected during development[19].

The testing involves checking various application features, such as transaction history, financial records, financial reports, and notifications[20]. Each feature will be tested under multiple scenarios to ensure the application functions correctly, provides a consistent user experience, and is error-free. Testing is conducted on physical devices to obtain representative results and identify potential issues that may arise across different device configurations.

Table 4. Black box Testing

Feature	Test Description	Test Scenario	Expected results	Status
Splash Screen Page	Ensures the splash screen page appears when the application is first opened.	Opening the application for the first time.	The splash screen page displays correctly.	Succeed
Register Page	Ensure that the registration feature works as intended.	Fill out the registration form with valid data.	The user successfully registered and logged into the system.	Succeed
Login page	Ensure that the login feature can be accessed properly.	Login using valid and invalid data.	The user either successfully logged in or received an error message.	Succeed
Dashboard page	Ensure the home page displays information correctly.	1. display income 2. display expenses 3. display savings 4. display financial education	The data displayed is based on the financial records page.	Succeed
Transaction History Page	Ensure transaction history can be viewed correctly.	1. history of incoming money 2. history of outgoing money 3. search transaction feature	The data displayed is a history of incoming and outgoing money transactions.	Succeed
Financial Notes Page	Ensures users can record incoming/outgoing money.	1. Make a note of incoming money 2. Make a note of outgoing money	The note is saved and appears in the transaction list.	Succeed
Financial Report Page	Ensure financial reports appear accurately.	1. monthly report 2. weekly report 3. daily report 4. reporting period	The report notes display all monthly, weekly, and daily cash-in and out reports and the required search period.	Succeed
Notifications	A warning notification appears	A warning notification appears when you are almost reaching the limit	This notification will appear automatically when the user's Balance is below the set limit, IDR 100,000.	Succeed
Notifications	A warning notification appears	A warning notification appears if the limit is exceeded.	This notification appears when the Balance has reached the set limit of 50,000.	Succeed
Daily Notifications	Daily alerts appear	A warning appears to record daily incoming and outgoing money.	This notification appears daily at 8 pm, a reminder to record daily expenses.	Succeed
Monthly notification	A notification appears to warn you about the monthly balance top-up.	The latest balance top-up warning appears.	This notification appears every month on the 20th to remind users to add their latest Balance.	Succeed
Setting	Ensure application settings can be accessed and changed.	Open the settings menu and make changes.	Changes are saved and working fine.	Succeed
Testing on various devices	Ensure the app runs well on different devices.	Testing apps on Android and iOS devices.	The application works optimally on all devices.	It cannot be installed on IOS

5. Conclusion

Based on the research findings, the conclusions can be outlined as follows:

1. Proper financial management is crucial for final-year students facing economic challenges.
2. Students often struggle to record and analyze expenses, leading to financial problems.
3. This research aims to develop an Android-based financial management application using a rule-based solution.
4. The application is designed to help students manage their expenses, set budgets, and improve financial literacy.
5. The expected outcome is better financial management and reduced future economic risks.
6. With automatic recommendations or more interactive financial data visualizations.

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