

# AI Based Personal Finance Management System

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## Abstract:

The lack of financial literacy, increased costs of living, and inadequate budgeting habits are increasing the complexity of personal finances in the world based on a fast-paced digital environment. Professional financial advisors provide guidance to many people who tend to use their services at high fees and also give them biased advice. The available financial applications are largely transactional, do not analyse or support decisions at the level of an individual. The given project introduces an Intelligent Financial Guidance System that provides simple financial guidance with the help of basic artificial intelligence based on the rules in the form of a web-based platform. The system gathers data on the user (income, expenses, savings, EMI payable, risk preferences, and financial goals) and process financial health analysis using a set of heuristic rules and ratio approaches. On this analysis Risk levels are predicted and recommendations are made to the budgeting, savings and simple investment planning. The software is written in Python and Flask on the back-end side, HTML, CSS, JavaScript and SQLite on the front-end and database administration. The system undergoes accuracy, consistency, and usability testing in the typical web settings. It seeks to increase financial awareness, help in making informed decisions and decrease the reliance on costly financial advisors. Additional improvements that can be made in the future are the use of machine learning model, stock market, and development of mobile applications.

**Keywords** - Artificial Intelligence, Rule-Based System, Personal Finance, Financial Health, Investment Recommendation, Flask, Web Application

## 1. INTRODUCTION

Intelligent Financial Guidance System Using Artificial Intelligence refers to a web-based application, which gathers financial information of the user, and delivers customized financial well-being evaluation and recommendations that can be followed, through AI principles of rule-based logic and financial ratio analysis. It allows the user to input monthly income, expenses, savings, EMI or debt repayment, risk preference and financial objectives, which are calculated by a backend engine to calculate the main financial ratios and assess the financial status of the user. It uses a model of rule-based classification of financial health to adjust the risk profile, and use the prioritized budgeting, savings, and investment planning recommendations. It is written in Python and uses the Flask framework to handle the back-end, and HTML5, CSS3, and Bootstrap to assemble a responsive front-end, and SQLite to store data. It

operates on any typical web browser and needs no installation and adheres to the Model-View-Controller architecture to ensure good segregation of data, logic and the presentation. The system will be used in the educational and decision-support context and will provide a transparent and easy-to-use platform promoting financial awareness among religious individuals and prompting them to spend money responsibly without substituting professional financial advisors.

## 2. PROBLEM STATEMENT

The aforementioned problem of not having structure explained by financial illiteracy and unorganized information can forward many people in their personal finances management making it hard to comprehend such terms as budgeting, savings rates, and debt management. The high cost of seeking the services of professional financial advisors also acts as a limitation in accessibility particularly to the

low- and middle-income group and creates the risk of bias in advice. Current digital banking and investment apps are primarily centered around transactional applications and have little or no personalized financial analysis/planning assistance. Traditional manually based budgeting (spreadsheets) is time consuming, subject to errors and requires prior financial expertise lacking automated insights and suggestions. Financial advisors are expensive yet reliable and not as easy to access when compared to a human financial advisor, and banking apps and manual methods do not offer a thorough assessment of financial health and risk profiling.

The Intelligent Financial Guidance System proposed will overcome these limitations by providing a free and web-based system that automates the financial analysis through rule-based AI approaches. It gathers user data like income, expenses, savings, EMI payments, risk inclinations, and financial ambitions and crunches them using a structured backend software. The system calculates financial ratios, analyzes financial health, reconfigures risk profile, and make priority-based budgeting, saving, debt management, emergency funds, and investment recommendations. It is written in Python, Flask, HTML, CSS, Bootstrap, and SQLite and is based on a Model-View-Controller design and uses any standard web-based browser to operate. The platform will be easy to use, transparent and easy to access and will facilitate sound financial decisions and awareness creation. It lowers the need to have expensive advisors and provides a clarifiable insight and helps users aiming to monitor their financial performance in the long-run.

### 3.SYSTEM ANALYSIS

Financial ratio analysis measures the financial health of an individual in terms of income, expense, savings and relationship with debt. It includes four important ratios determine by the system: savings rate, expense ratio, debt-to-income (DTI) and liquidity ratio. These ratios represent financial restraint, expenditure pattern, debt to equity ratio

and preparedness against emergencies. According to typical scales, each ratio is categorized as Excellent, Good, Moderate, or Critical. To compute the overall financial health, the system employs rule-based AI with IF-THEN logic by examining these ratios. It utilises forward chaining to take process inputs, matching rules and produce explicit recommendations. The rule engine guarantees transparency, consistency and explainability of the outputs to the users.

A risk profiling mechanism is a two-stage mechanism that encompasses risk preference and real financial ability of the user through declarations to the system. System modulates the risk levels depending on the ratios to make realistic suggestions on investments. According to the effective risk profile, it suggests appropriate choices of fixed deposits, PPF, mutual funds or equities. Other financial goals taken into account in the system are the development of savings, reduction of debts, emergency funds, pension and investments. In general, it provides a tailored financial information and aids in decision making.

### 4.system design

The system is built according to the three layered architecture which includes presentation, logic and data. User interaction and input collection is done by constructing the presentation layer with HTML5, CSS3, bootstrap and JavaScript. Financial analysis and the logic layer are done with Flask that handles the requests and does financial analysis, whereas the data is stored in the SQLite to keep the user, financial data, and analysis results. It is based on the Model-View-Controller architecture to have clear separation of components. Users are able to create accounts, log in, add financial information, and access the results of the analysis and recommendations. It implements an investment strategy that is diversified and invests in various financial instruments and presumes investment value, expected returns, and long-term wealth values. The fundamental modules are authentication, input validation, analysis engine, recommendation engine and display of results. Generally, the system provides automated analysis,

strong security in data operation and pleasant financial advice.

Figure 1: System Architecture Diagram

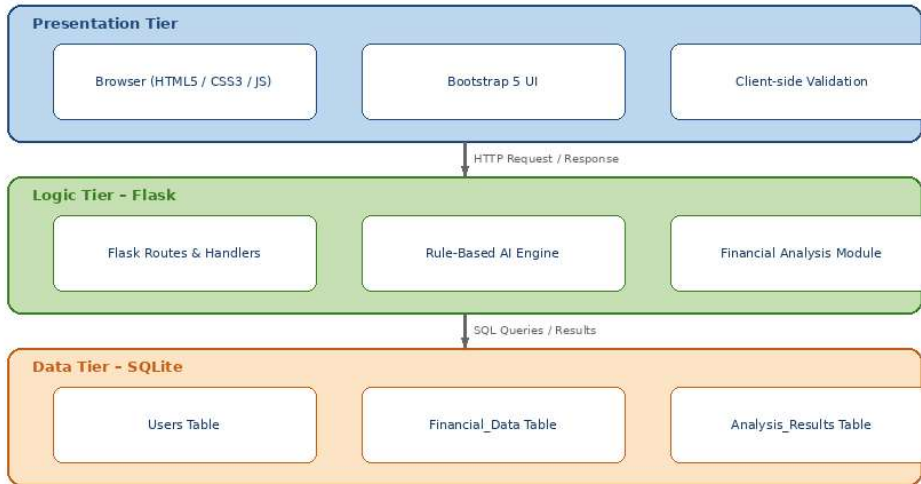
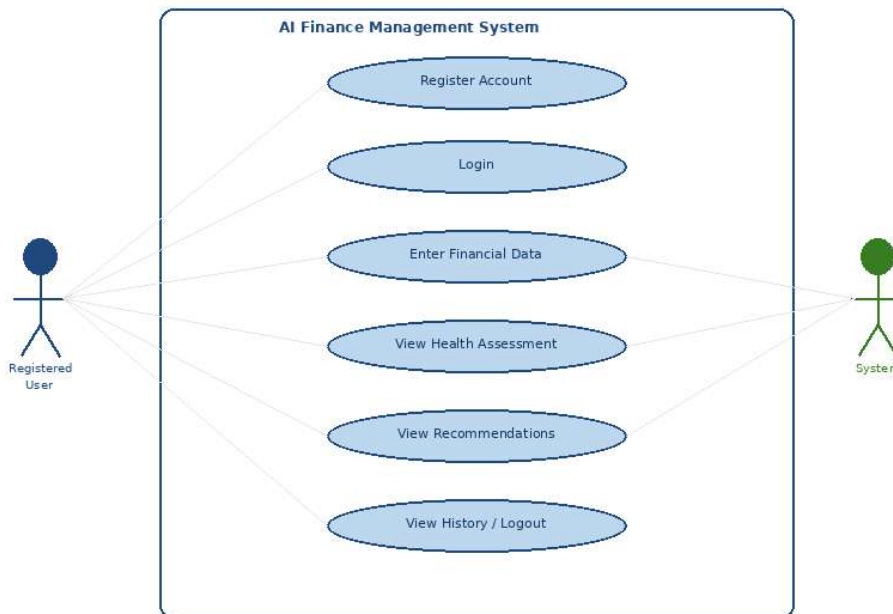
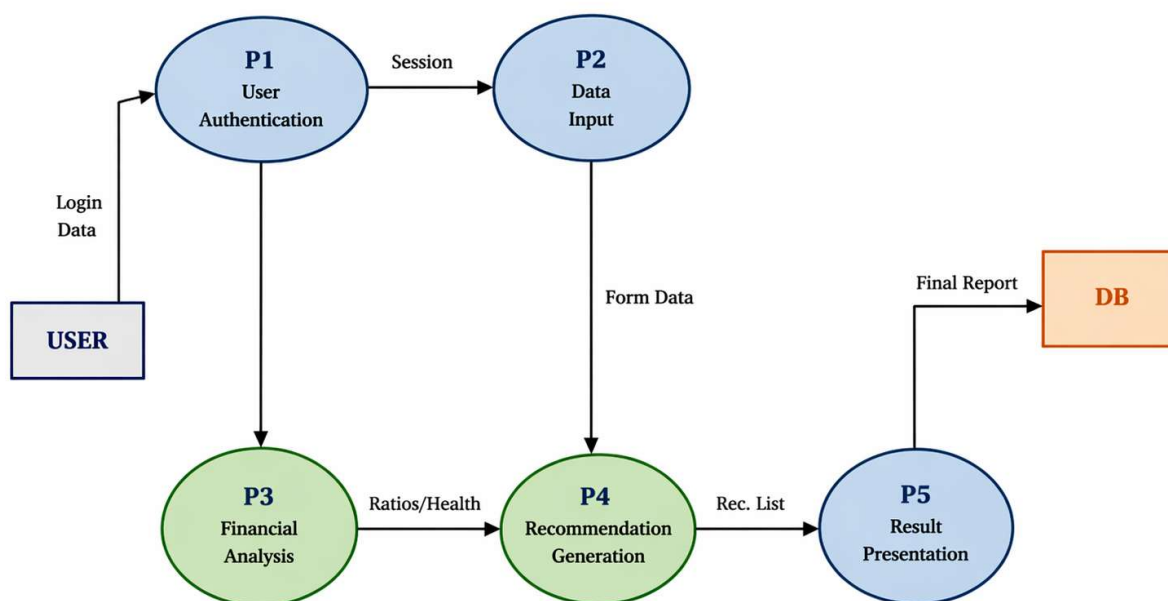


Figure 2: Use Case Diagram



**Figure 3: Level 1 DFD – System Data Flow**



## 5.RESULTS

Various scenarios of the input were used to test the system in order to determine its performance and accuracy. The findings suggest that the system is able to compute the financial ratios and correctly categorize financial health in accordance to predefined rules. The suggestions that are produced by the system are applicable and give useful advice to the users. The interface is user friendly and easy to use, enabling the user to navigate through the system. The system is efficient and its results are obtained within a short period. Generally, the system fulfills its purpose of offering financial advice and enhancing decision-making skills.

## 6.CONCLUSION

Intelligent Financial Guidance System is an efficient system of dealing with personal finances with the help of artificial intelligence provided by rules. It eases the financial analysis and offers recommendations, which are customized to assist users make informed financial decisions. The

system is affordable, user-friendly, and appropriate to people who lack financial literacy. The system helps to better the financial status of users by encouraging financial awareness and good money management habits. It is an effective tool that can be used by students, novices, and those who lack access to professional financial advisory services.

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