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AI- BASED FINANCE MANAGEMENT SYSTEM

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Abstract:

The AI-Based Finance Management System helps users manage personal finances efficiently through a simple, secure, and intelligent platform. It enables users to upload bank statements in PDF format, extract and categorize transactions, and gain meaningful financial insights using a rule-based approach. The system includes goal-based savings planning to help users achieve targets like buying a phone, vehicle, or house without loans. It also provides expense tracking, spending analysis, and smart suggestions to improve financial habits. Overall, the project offers a lightweight and privacy-focused solution for better financial decision-making.

Keywords: Artificial Intelligence (AI), Rule-Based Systems, Natural Language Generation (NLG), Flutter Framework, Dart Programming Language, Firebase Storage, PDF Data Extraction, Transaction Parsing, Expense Categorization, Financial Data Analysis, Goal-Based Savings System, Decision Support System, Privacy-Preserving Techniques

1. INTRODUCTION

he AI-Based Finance Management System is designed to help users manage their finances in a simple and secure way. It allows users to upload bank statements in PDF format and automatically extracts and categorizes transactions. The system uses a rule-based intelligent approach to provide personalized financial insights without complex AI models. It also includes goal-based savings planning to help users achieve targets like buying a phone, vehicle, or house. Additionally, it offers expense tracking and smart suggestions to improve financial habits. Overall, the system promotes better financial decision-making while ensuring data privacy.

2. LITERATURE SURVEY

The literature survey analyzes existing finance management applications such as Mint, Walnut, and Goodbudget to understand their features and limitations. It highlights gaps in areas like privacy, intelligent insights, and advanced financial prediction. Based on this analysis, the proposed AI-based system aims to provide a more secure, smart, and user-friendly solution.

Feature / System	Mint	Walnut	Goodbudget	Proposed System
Data Input Method	Manual + Bank Sync	Automatic (SMS-based)	Manual Entry	PDF Upload + Smart Parsing
Privacy Handling	Medium (Bank Access Required)	Low (SMS Access Needed)	High	High (No SMS / Secure Upload)
Real-Time Insights	Yes	Yes	Limited	Yes (AI-Based Insights)
Budget Planning	Yes	Yes	Yes (Envelope Method)	Yes (Dynamic AI Suggestions)
Expense Categorization	Automatic	Automatic	Manual	Automatic (Rule-Based + AI)
AI/ML Integration	Limited	No	No	Yes (Smart Analysis + NLG)
Goal Setting Feature	Yes	No	Yes	Yes (Smart Goal Tracking)
Spending Alerts	Yes	Yes	Limited	Yes (Intelligent Alerts)
Financial Recommendations	Basic	No	No	Yes (Personalized Insights)
User Interface	Moderate	Simple	Basic	Clean & Modern (Instagram-like UI)

3. PROPOSED SYSTEM

The proposed system is an AI-based finance management application designed to simplify expense tracking and financial analysis. It allows users to upload receipts and bank statement PDFs, from which financial data is automatically extracted and categorized. The system generates intelligent insights such as spending patterns, monthly summaries, and savings analysis. It reduces manual effort through automation and improves accuracy using AI techniques. The platform ensures high data privacy by avoiding SMS or direct bank access. Overall, it provides a secure, smart, and user-friendly financial management solution.

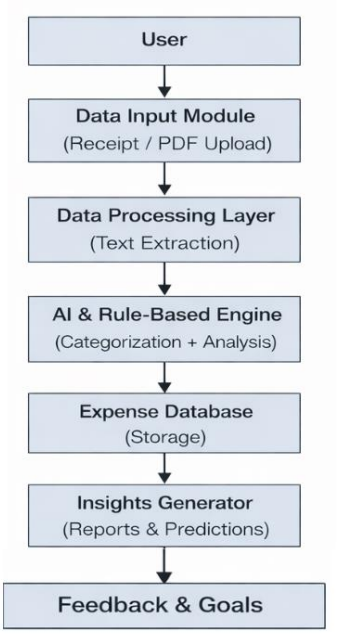


Fig 1: Proposed System

The system to provide real-time information such as:

- User Data Input (Real-Time Data Entry)
- Data Processing (Instant Extraction
- AI-Based Analysis (Live Categorization
- Database Update (Immediate Storage)
- Insights Generation (Dynamic Reports)
- User Dashboard (Live Visualization)

- Feedback & Goals (Adaptive System)

4. Methodology

The methodology of the system is organized into the following steps:

1. Data Collection

The system collects financial data from users through receipt uploads and bank statement PDFs. This ensures secure and user-controlled data input without requiring SMS or direct bank access.

2. Data Preprocessing

Uploaded documents are processed using text extraction techniques to retrieve important details such as transaction amount, date, and merchant name. The extracted data is then cleaned and formatted for further analysis.

3. Data Categorization

A rule-based and AI-assisted approach is used to classify transactions into categories such as food, travel, bills, and shopping. This improves accuracy while avoiding complex machine learning models.

4. Data Storage

All processed and categorized transactions are stored in a secure database (Firebase Storage), ensuring efficient retrieval and data management.

5. Data Analysis

The system analyzes user spending patterns to generate meaningful insights such as monthly expenses, category-wise distribution, and savings trends.

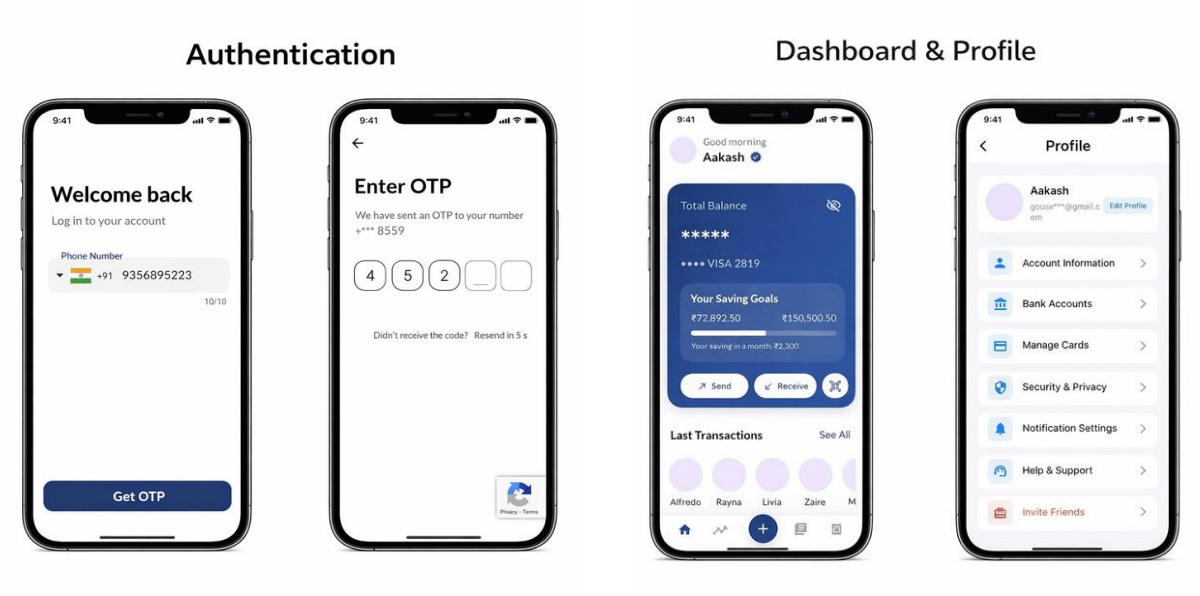
6. Insights Generation

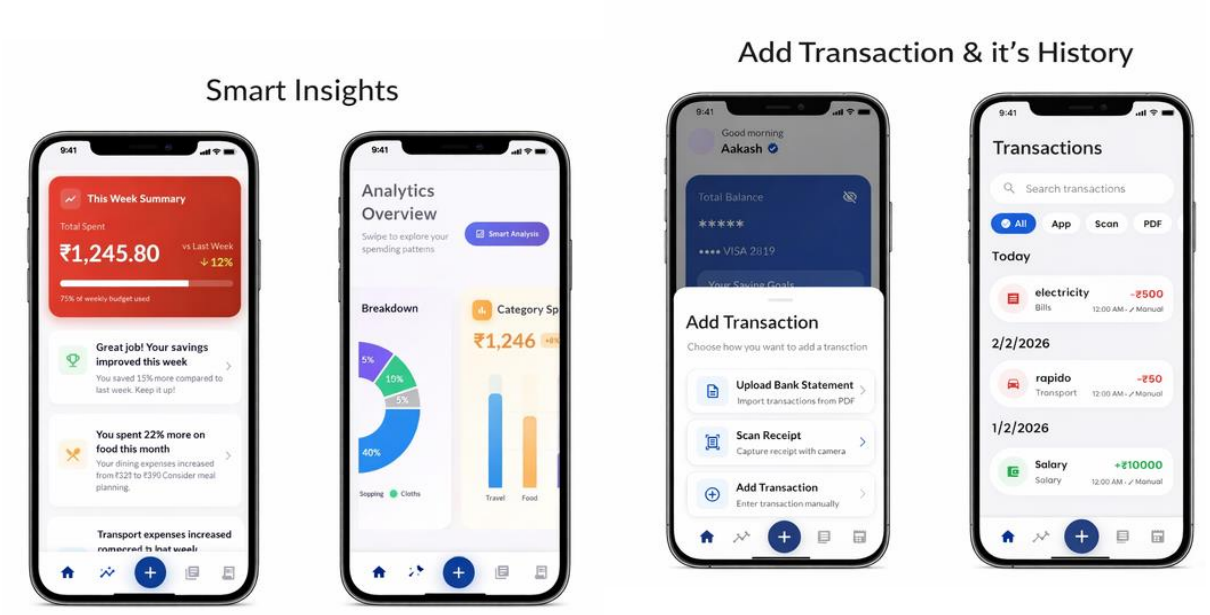
Based on analysis, the system provides intelligent financial insights and recommendations, helping users make better financial decisions.

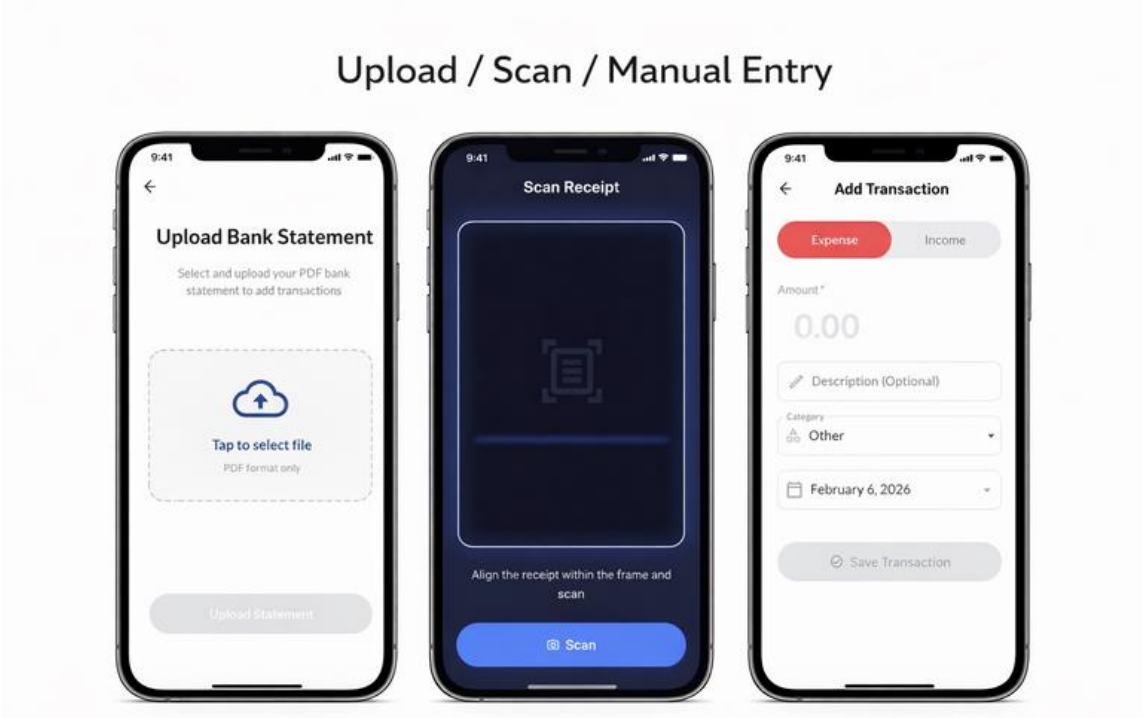
7. Visualization & User Interface

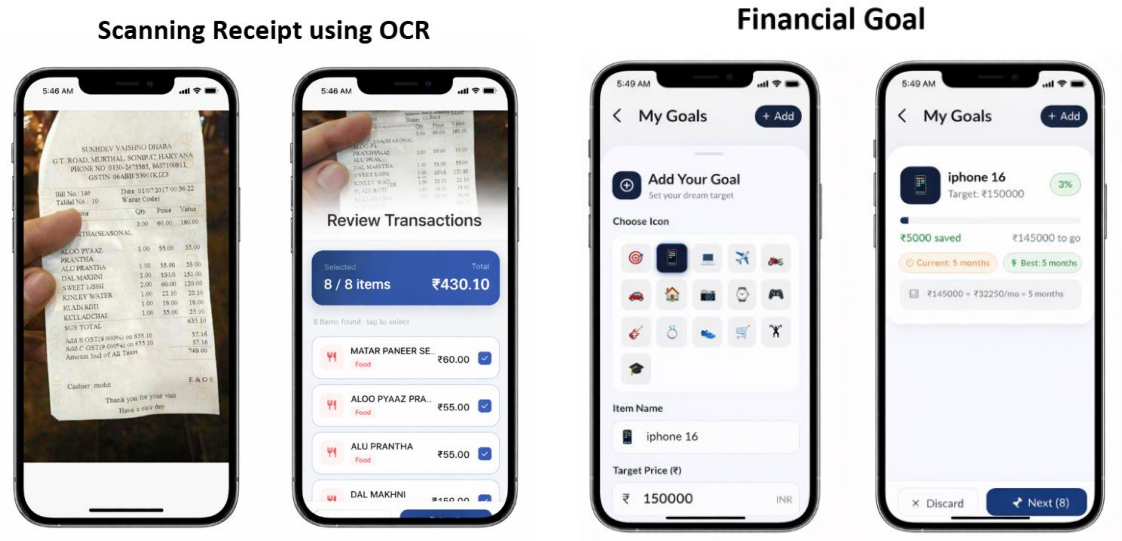
A user-friendly dashboard displays reports, charts, and summaries in a clean and modern UI, allowing users to easily understand their financial status.

5. Results






Upload / Scan / Manual Entry
9:41
Upload Bank Statement
Select and upload your PDF bank statement to add transactions
Tap to select file
PDF format only
Upload Statement
9:41
Scan Receipt
Align the receipt within the frame and scan
Scan
9:41
Add Transaction
Expense
Income
Amount *
0.00
Description (Optional)
Category
Other
February 6, 2026
Save Transaction



Overall, the system demonstrated reliable performance in monitoring, protection, and balancing of the battery pack

6. CONCLUSION

The AI-Based Finance Management System provides an efficient and intelligent solution for managing personal finances. It simplifies expense tracking by allowing users to upload receipts and bank statement PDFs, reducing manual work. The system uses AI and rule-based techniques to automatically categorize transactions and generate meaningful insights. It ensures high data privacy by avoiding SMS access and direct bank integration. The application also offers real-time analysis, goal tracking, and smart financial recommendations. With a user-friendly interface, it enhances user experience and financial awareness. Overall, the system helps users make better financial decisions in a secure and effective way.

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