International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 06 | June - 2025 SJIF Rating: 8.586 ISSN: 2582-3930

AI-POWERED FINANCE ASSISTANT

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Abstract - FinU is an AI-driven financial management Platform designed to simplify personal finance through Automated transaction categorization,real-time budgeting insights and predictive analytics. Leveraging machine learning and cloud technologies.FinU offers features like expense tracking ,bill reminders , and dynamic visualisations to enhance financial discipline .The system integrates natural language processing (NLP) for transaction classification and Microsoft Azure for secure data storage .With an intuitive interface and scalable architecture ,FinU aims to bridge gaps in financial literacy and empower users to achieve long -term financial stability.

1.INTRODUCTION

In an era of dynamic financial demands, managing personal finances remains a challenge for many. FinU addresses this by combining AI, machine learning, and cloud computing to deliver a seamless financial management experience.
FinU is an intelligent financial management platform that uses machine learning and natural language processing to help users track expenses, monitor spending, and make informed budgeting decisions. It offers personalized insights, predictive analytics, and automated bill reminders to simplify financial management and promote better money habits.

2. LITERATURE SURVEY

2.1 AI-Driven Finance Forecasting and Budgeting System

The paper introduces an AI-driven financial forecasting and budgeting system that enhances accuracy and efficiency in financial decision-making. It uses historical data, machine learning, and predictive analytics to adapt to market changes, enabling real-time strategic planning and dynamic resource allocation. The system integrates multiple data sources to improve prediction accuracy and automate processes. It highlights AI's potential to reduce risks, cut costs, and support better decisions. Despite challenges like model complexity and data interpretability, future improvements aim to include natural language processing and expand its financial applications.

2.2 AI-Powered Personal Finance Assistant

The paper proposes an AI-powered personal finance assistant designed to tackle issues like low financial literacy, lack of personalization, and ineffective budgeting tools. Unlike static, generic solutions, this system uses machine learning and

natural language processing to offer personalized insights, automated expense tracking, customized budgeting, and tailored investment advice. Built with technologies like React.js, Flask, MongoDB, and Firebase, it provides an intuitive and intelligent platform. The assistant's effectiveness will be evaluated through usability tests and user studies, aiming to improve financial literacy, decision-making, and outcomes. With secure data handling and adaptive design, it offers a comprehensive, user-centric approach to managing personal finances.

2.3 Prophet Model in Financial Performance Forecast

The paper investigates using Facebook's Prophet model for forecasting financial performance, focusing on its potential to improve speed and accuracy in analyzing large financial datasets. It uses data from 173 companies in Turkey's BIST Manufacturing Sector (2009–2020) to predict net profit/loss. The model, implemented in Python, was evaluated using MSE, RMSE, and MAPE metrics, revealing mixed accuracy across different data segments. While Prophet is found to be efficient and user-friendly, the study suggests that combining it with other AI methods could improve its accuracy. It recommends hybrid models for future financial forecasting research.

2.4 Large Language in Personal Finance Management

The paper explores how Large Language Models (LLMs) like ChatGPT, Gemini, Claude, and LLaMA can help address personal finance challenges in the U.S., such as taxes, loans, and investments. These models show about 70% accuracy in providing financial advice, with newer versions performing better. However, they struggle with complex financial queries and vary in performance by topic. The study highlights their potential to aid both individuals and advisors, concluding that future advancements could make LLMs more reliable tools for personal finance management.

2.5 AI-Driven Personal Finance Management System

The paper introduces an AI-powered personal finance management system designed to tackle modern financial challenges like fragmented data and outdated tools. Using machine learning, the system offers real-time analysis, automated transaction categorization, predictive insights, and personalized advice. A six-month pilot with 1,000 users showed improved savings, reduced stress, and better financial health. The study also stresses the importance of ethics and data security. Overall, it showcases AI's potential to provide a proactive and personalized approach to financial stability and long-term planning.

2.6 Mobile-Based Expense Tracking and Budgeting System

The paper introduces a mobile budgeting and expense tracking app created in response to increased interest in personal finance, especially after COVID-19. Aimed at addressing the lack of financial education among young people, the app helps users—particularly students and young adults—easily track income and expenses. Built with HTML, CSS, JavaScript, and Firebase, it includes a recommender system for personalized advice and visual spending insights. Using a prototyping approach, the study highlights the app's role in promoting consistent financial habits and serves as a foundation for future personal finance app development.

3. SYSTEM ANALYSIS AND DESIGN

The system aims to provide users with an intelligent financial management platform that enhances budgeting, expense tracking, and financial decision-making. FinU is a smart,.The system integrates automated transaction categorization, expense monitoring, and forecasting models to analyze spending patterns and suggest budget adjustments based on user data

3.1 MODULE DESCRIPTION

The system is composed of six key modules, each with specific functions aimed at improving user experience and financial management:

1. User Management Module

Handles user registration, secure login, and profile management.
Inputs: Email/username, password, preferences
Outputs: Authentication tokens, profile data, alerts

2. Transaction Management Module

Manages financial transactions via manual input or bank syncing, with automated categorization.
Inputs: Transaction details (amount, date, category, etc.)
Outputs: Categorized lists, summary reports

3. Financial Insights & Analytics Module

Provides real-time insights through charts and alerts, analyzing spending trends and anomalies.
Inputs: Transaction history
Outputs: Visual reports, alerts

4. Budget Planning & Forecasting Module

Enables budget setup and forecasts future financial trends using AI.
Inputs: Budget goals, income, expense trends
Outputs: Budget status, forecasts, savings progress

5. Notification & Reminder Module

Sends reminders for bills and alerts for spending or goal deviations.
Inputs: Preferences, bill dates
Outputs: Notifications, alert messages

6. Admin & Analytics Dashboard Module

Allows administrators to manage users, monitor system performance, and moderate content.
Inputs: Admin actions, user feedback
Outputs: Analytics, logs, moderation tools

3.2 SYSTEM REQUIREMENTS

1.Functional Requirements

The FinU Financial Management System offers secure, role-based access and supports real-time, intelligent financial services. Key features include automated transaction categorization, budget setting and tracking, bill reminders, and financial forecasting. It securely stores user data in the cloud, allows filtering and exporting of financial reports, and provides real-time alerts for anomalies. An admin dashboard supports user and trend management in enterprise setups. The system is responsive and synchronized across devices for a seamless user experience.

2.Non-Functional Requirements

FinU's non-functional requirements ensure the system is reliable, secure, scalable, and user-friendly. It must deliver high accuracy in AI-driven transaction categorization and forecasting, with fast performance and minimal delays. The system should handle large user bases and data volumes efficiently, maintain strong data security with encryption and GDPR compliance, and ensure high availability through backups and fault-tolerant architecture. A clean, intuitive interface, cross-device compatibility, and modular, maintainable design further support usability and long-term adaptability

3.2.1 Development Environment

The development environment defines the tools, technologies, and hardware needed to build and run the FinU system effectively.

Software Requirements:

Web Server: IIS and Kestrel

Database: MS SQL (Azure-hosted)

Languages & Frameworks: HTML, CSS, JavaScript (Frontend); C# with .NET and Blazor (Backend)

IDE: Visual Studio, Azure Data Studio

Libraries: Includes Entity Framework Core, Microsoft ML, Syncfusion, and Swashbuckle for data handling, machine learning, UI components, and API documentation

Hardware Requirements:

Server: Dedicated or cloud server with sufficient RAM and CPU

Storage: Enough space for files and databases

Internet: Stable connection for uninterrupted access

User Devices: Modern desktops, laptops, tablets, and smartphones with updated web browsers

3.2.2 Software Overview

This section outlines the key technologies and tools used in the FinU project:

Visual Studio: A powerful IDE from Microsoft used for developing and debugging web, desktop, and mobile apps. It supports multiple languages (like C#, JavaScript, Python), advanced debugging, IntelliSense, cloud integration, and version control via Git and Azure Repos.

HTML, CSS, JavaScript: Core web development technologies. HTML structures the content, CSS styles it, and JavaScript adds interactivity and dynamic features, forming the foundation of responsive and interactive websites.

SQL: A standard language used to manage relational databases. It enables creation, retrieval, updating, and deletion of data, and is essential for database operations in the FinU system.

Azure: Microsoft's cloud platform that supports app development and deployment through services like virtual machines, databases, machine learning, and DevOps tools. It offers scalability, security, and hybrid cloud integration.

NuGet: A .NET package manager that simplifies dependency management by allowing developers to easily add, update, and manage libraries, promoting code reuse and efficient development.

3.3 SYSTEM DESIGN

The system design of FinU outlines its architecture with a focus on scalability, performance, security, and maintainability.

It includes the following key components:

1. User Interaction (Frontend):
Built using HTML, CSS, JavaScript, and Razor Pages in .NET Core for dynamic UI rendering.

2. Backend & Routing:
User requests are routed and processed through a .NET Core-based Client App that handles logic and data communication.

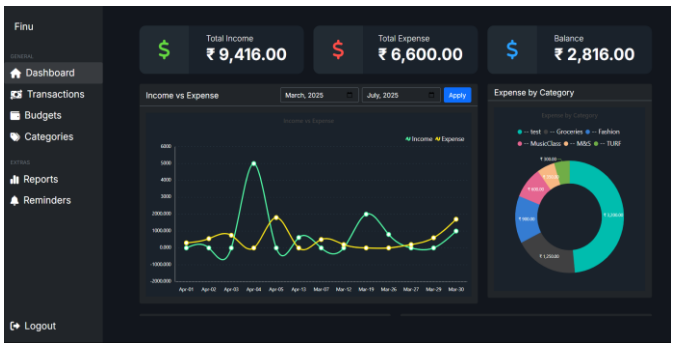
3. Database (Azure SQL):
Stores user and transaction data, supports CRUD operations, and integrates with backend and ML models.

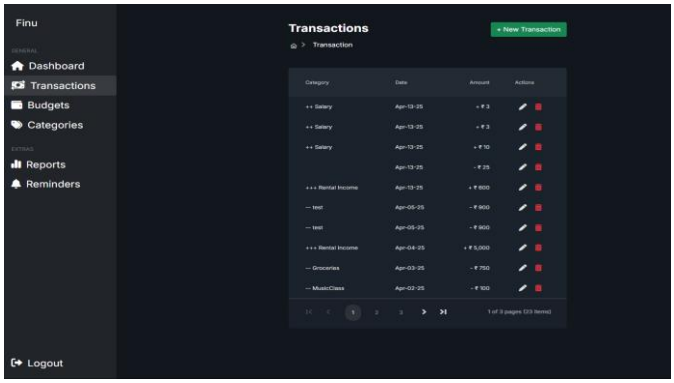
4. Machine Learning Integration:
Uses Microsoft ML frameworks to categorize transactions and forecast finances, processing data from the SQL database.

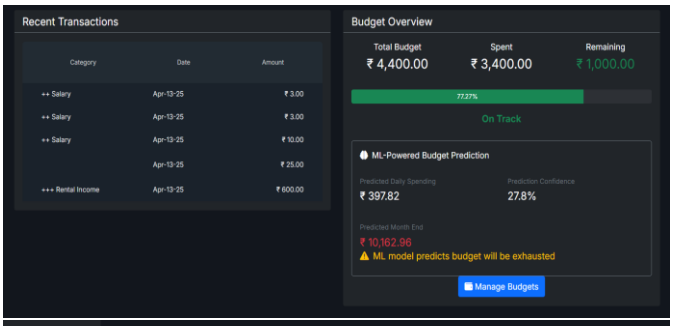
5. Notification System:
Sends financial alerts and reminders via in-app notifications and Gmail, triggered by specific events.

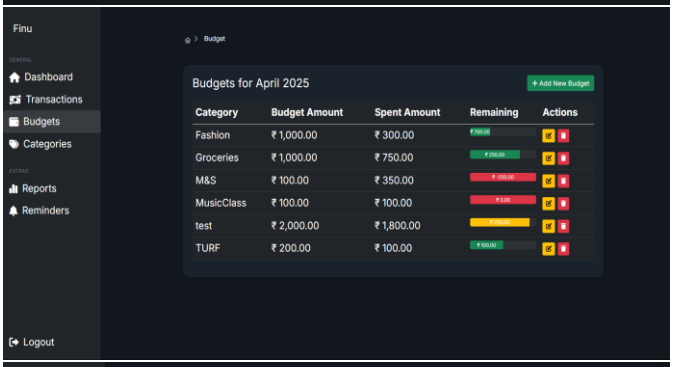
6. Cloud Deployment (Azure):
Hosted on Azure App Service for high availability, scalability, and reliable performance across services.

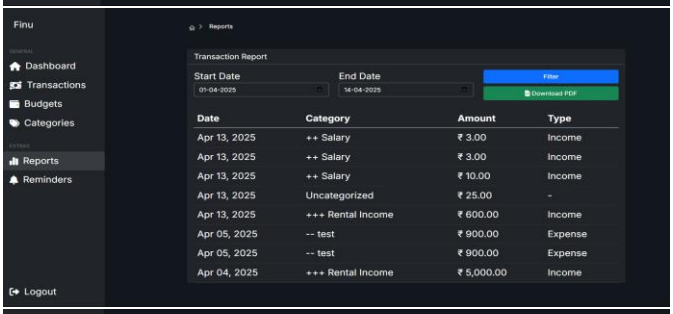
4. SCREENSHOTS

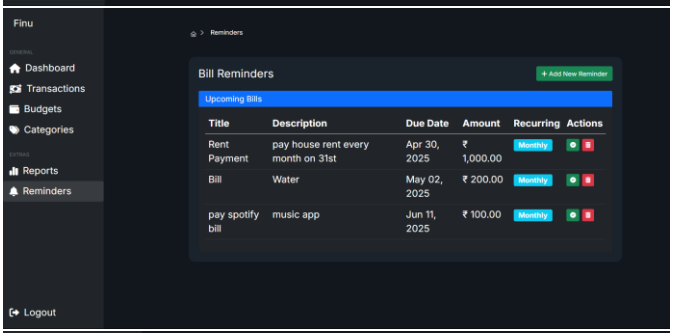


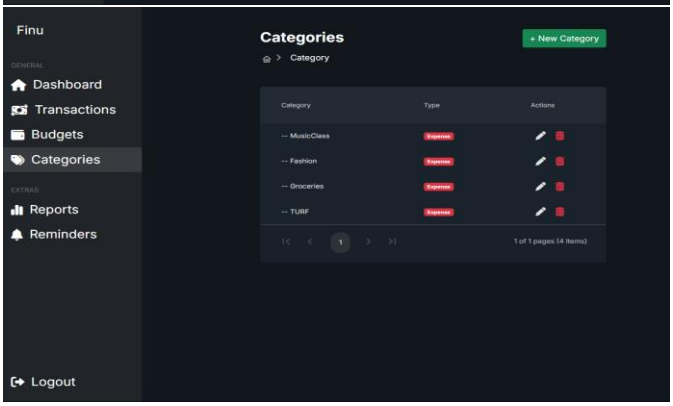












5. FUTURE SCOPE

1.AI & ML Enhancements

- Smarter NLP for transaction categorization.
- AI-driven financial coaching and fraud detection.
- Advanced predictive analytics for budgeting.

2. Multi-Platform Integration

- Mobile app with real-time alerts.
- Bank & API integrations for seamless transaction tracking.
- Support for Google Pay, PayPal, UPI, Stripe, etc

3. Cloud & Security Upgrades

- Zero Trust Security, blockchain for transparency

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4. User Engagement & Gamification

- Rewards for savings goals, community-driven finance discussions.

5. Global Expansion

- Multi-currency, multi-language support for international users.

6. CONCLUSIONS

The FinU platform represents a modern, AI-driven approach to personal financial management, addressing the growing need for intelligent, user-centric budgeting and expense tracking solutions. By integrating advanced features such as automated transaction categorization, real-time financial insights, predictive expense forecasting, and timely bill reminders, FinU offers a comprehensive solution that enhances financial discipline and decision-making.Leveraging machine learning and data analytics, the system is capable of identifying spending patterns, projecting future expenses, and delivering personalized budgeting recommendations. Its cloud-based architecture ensures scalability, data security, and continuous accessibility, while the intuitive user interface promotes ease of use for individuals across varying levels of technical expertise.In conclusion, FinU effectively overcomes the limitations of traditional financial tracking methods by offering an efficient, accurate, and intelligent platform tailored to meet the evolving financial management needs of users. It is well-positioned to support individuals and small businesses in gaining greater control over their finances and achieving long-term financial stability.

ACKNOWLEDGEMENT

We express our sincere gratitude to Ms. Praveena, Assistant Professor, Department of Computer Science and Engineering, NCERC, for her valuable guidance, support, and encouragement throughout the course of this project. Her mentorship played a vital role in shaping our research and ensuring its successful completion. We also thank the Nehru College of Engineering and Research Centre (NCERC) for providing the infrastructure and resources necessary to carry out this project effectively. We sincerely appreciate the efforts of all our project team members for their dedication, cooperation, and hard work at every stage of development.We are especially grateful to the volunteers who contributed fingerprint data during the testing phase, as well as to our parents and peers for their continuous support and motivation throughout this journey.

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