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Finance Tracker and Advisor

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***Abstract:** AI-powered Finance Tracker and Advisor is an intelligent system that leverages Artificial Intelligence (AI) and Machine Learning (ML) to advance personal finance management. The system unifies expense tracking, budget planning, debt management, and goal setting into a single platform. It analyses spending behaviour, generates personalized recommendations, and issues real-time overspending alerts. By integrating automation with predictive financial insights, the proposed solution enables users to strengthen budgeting practices, optimize savings, and achieve long-term financial stability.*

I. INTRODUCTION

The rapid expansion of digital transactions and financial services has increased the complexity of personal finance management, leaving individuals finding it hard to monitor their spending, establish budgets, and make well-informed choices. Conventional tools often lack flexibility and foresight, offering minimal assistance for forward-looking financial strategies. By utilizing advancements in Artificial Intelligence (AI) and Machine Learning (ML)[1][2], contemporary financial systems can evaluate user behaviour, identify spending trends, and deliver practical insights. With the developing openness of enormous, anonymised datasets, this field of concentrate previously seemed decade prior and has since formed into an independent subject [3]. This project aims to create a smart finance tracker and advisor to improve decision-making, enhance financial literacy, and facilitate effective money management[4][8].

II. LITERATURE SURVEY

The rapid advancements in artificial intelligence (AI) and machine learning (ML) have revolutionized the financial technology sector by enabling automated processes, tailored suggestions, and intelligent decision-making[1][4]. Numerous research and solutions have been proposed to facilitate personal finance management, with a focus on budgeting, investment advice, and cost tracking[5].

Machine learning algorithms are used by a number of AI-based expense monitoring systems to automatically categorize customer transactions[1][6]. These tools reduce human error and provide visual insights into consumers' purchasing habits. Similar to this, budgeting systems driven by machine learning have been created to analyse past transaction data, project future expenses, and recommend suitable savings targets—all of which improve user financial awareness and management[7].

NLP is employed by some models of intelligent financial advisors to understand customer questions and provide relevant financial advice through chatbot-like interfaces[8].

These conversational bots assist users in managing their finances in an interactive and simple manner. Deep learning models have also been used to analyses customer spending patterns and detect overspending tendencies in an effort to improve decision-making and promote greater financial discipline[9].

Predictive analytics has made it easier to forecast future income, expenses, and potential debt concerns in personal finance[4][10]. This strategy lowers decision-making ambiguity and fosters data-driven financial planning. Additionally, modern financial management platforms have integrated AI and cloud computing to securely store, process, and present personal financial data, giving consumers easy access to and control over their funds[2][6].

III. METHODOLOGY

AI-Powered Finance Tracker and Advisor combines AI, ML, and NLP through a modular design approach to deliver personalized advisory services and efficient financial management[3][8]. Several functional layers in the system architecture ensure scalability, data security, and real-time performance.

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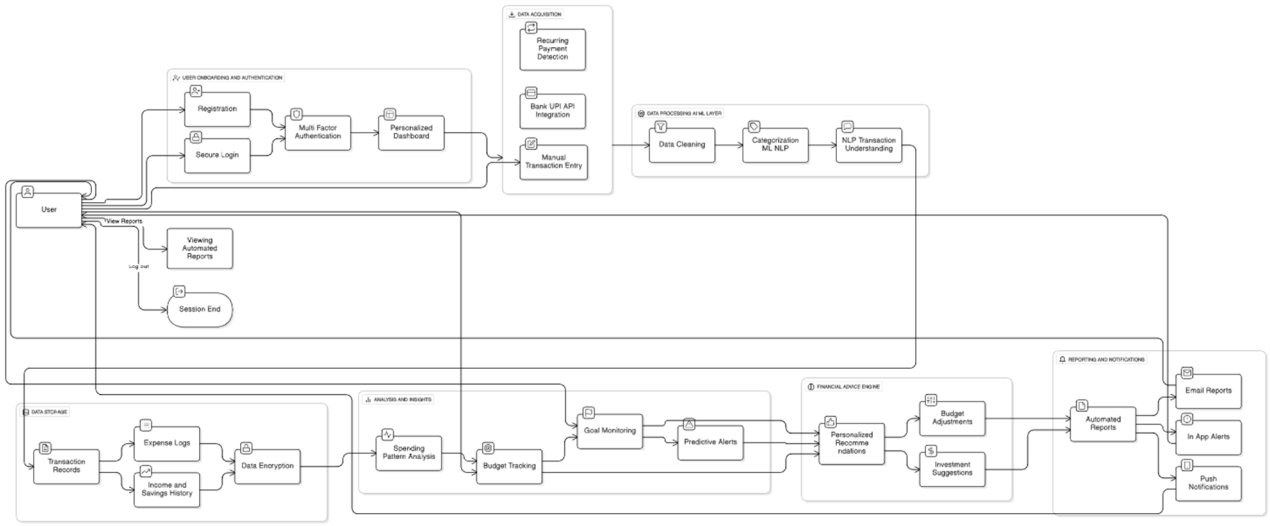


A. User Onboarding and Authentication

During this stage, each user's access is safe and personalized. The user registers through the system and undergoes multi-factor authentication in order to enhance data security. After a successful login, users are directed to a personalized dashboard that displays spending patterns, financial summaries, and alerts[10].

B. Data Acquisition

Data is gathered through Bank UPI/API connectivity and periodic payment detections[7]. These data sources provide both structured and unstructured transaction data, which are then further processed using AI and NLP pipelines.

C. Data Processing using AI and ML Layer

The gathered data is cleansed to remove inconsistencies and duplicates. The cleansed data is then processed using machine learning and natural language processing (NLP) models to understand the semantics of spending details and classify transactions[1][5]. This enables automatic recognition of spending categories such as utilities, food, and subscriptions.

D. Data Storage

Processed financial data is securely stored in encrypted databases, and Prisma ORM is used for efficient schema management[8]. The module maintains transaction records, income and savings histories, and expense logs in an encrypted way to ensure secrecy and compliance with privacy laws.

E. Analysis and Insights

This stage involves drawing meaningful inferences from the data that has been saved[9]. By examining expenditure patterns, the system finds trends in user behavior and consumption. The budget tracking and goal monitoring modules allow users to create financial goals, measure their progress, and receive AI-based advice to better their spending habits[3].

F. Financial Advice Engine

Financial advising engines utilize machine learning (ML) algorithms to generate predictive alerts and tailored suggestions[2][6]. With the help of these insights, users may adjust budgets, manage debt, and investigate investment choices that fit their spending habits. Real-time decision-making enhances financial literacy and fosters long-term stability[10].

G. Reporting and Notifications

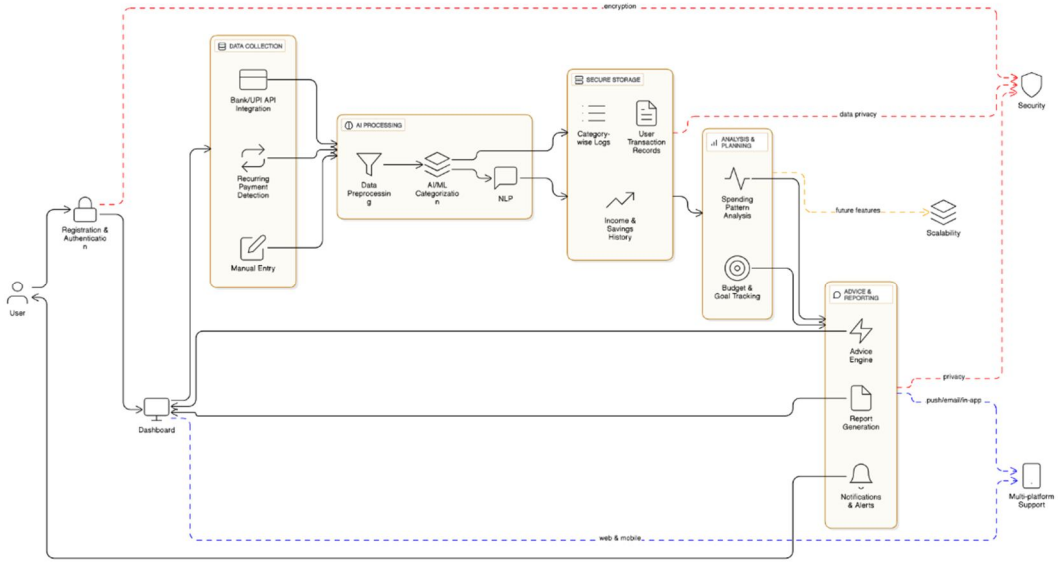
The reporting module generates automatic financial reports that aggregate profits, expenses, and savings[7]. Users are notified via a variety of methods, such as email reports, in-app alerts, and push notifications. These updates ensure that users remain aware of their financial actions and potential overspending.

H. Software Architecture

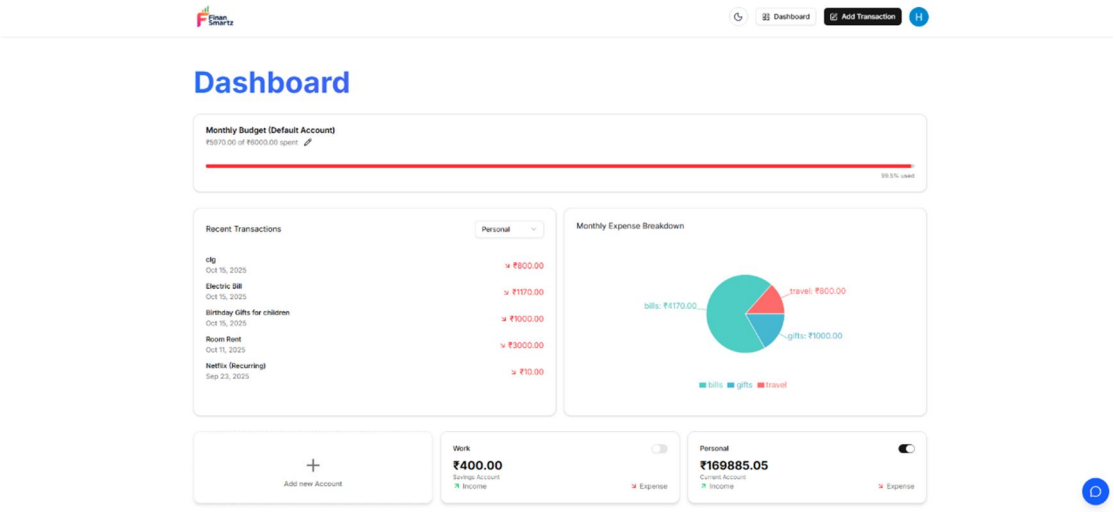
Next.js serves as the primary application framework for the system's implementation[8]. Among the components of the modular architecture are:

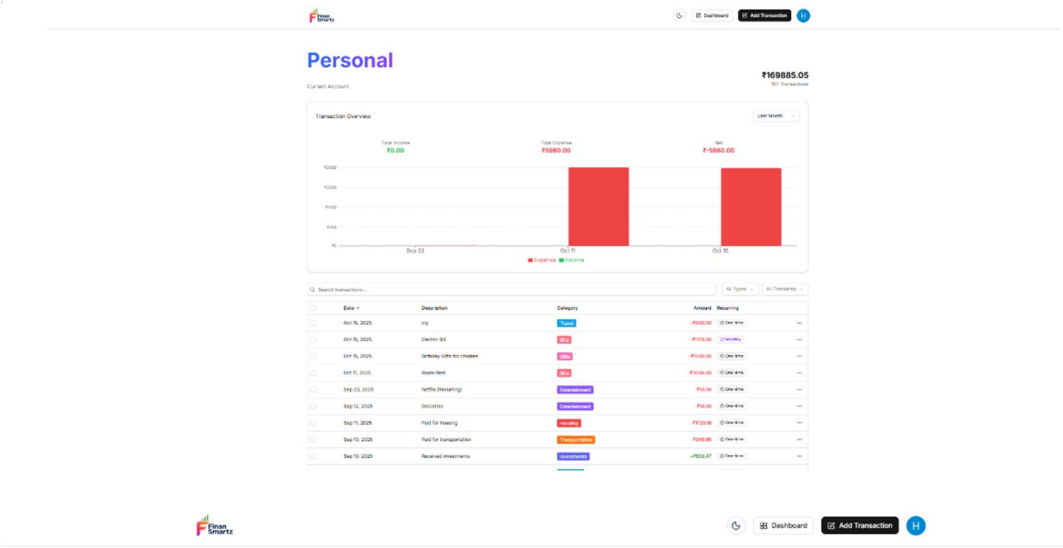
1) App Module: Controls routing, layouts, and page navigation.
2) The Components Module contains reusable user interface components for uniformity.
3) Data Module: Manages static datasets and dummy data.
4) Emails module: templates for automatic alerts are created via the emails module.
5) Hooks Module: asynchronous logic and state are managed by the Hooks Module.
6) Lib Module: Provides shared utilities and configuration.
7) The Prisma Module defines the ORM logic and database schema.
8) Public module: fonts and graphics are examples of static assets that are kept in the public module.
9) Middleware & Config Module: Maintains middleware settings and Next.js.

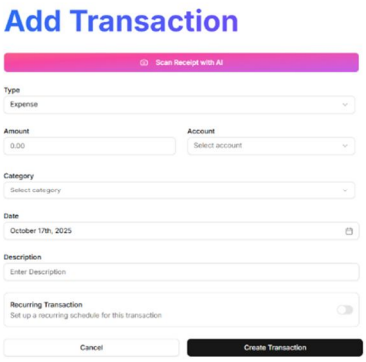
This modular design ensures excellent efficiency, ease of scaling, and maintainability. It also makes the system adaptable enough to future additions, such as integration with external financial APIs or investment predictions[10].

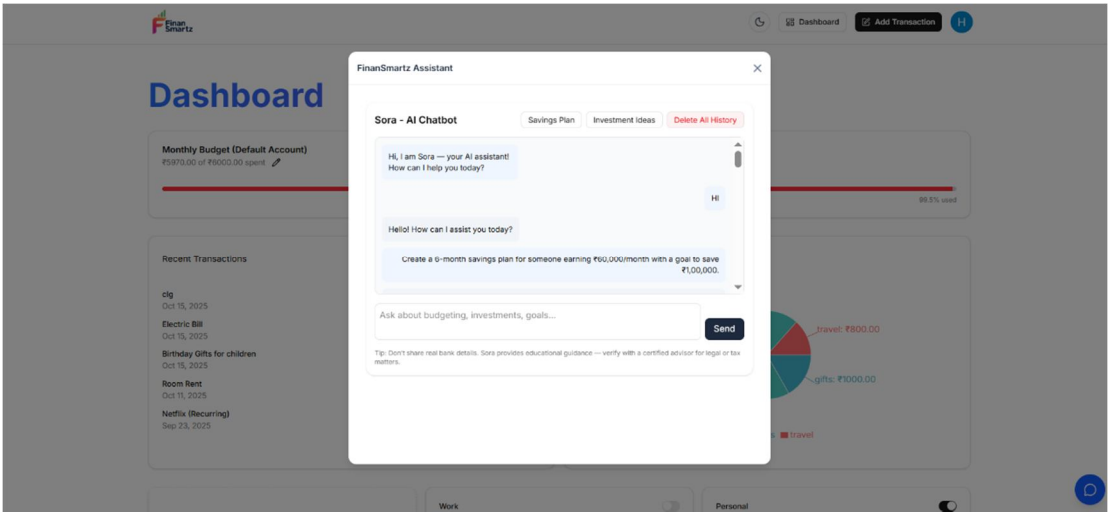


IV. RESULT









V. CONCLUSION

The Finance Tracker and Advisor utilize AI and machine learning to provide smart expense monitoring, budgeting support, and customized financial advice. By overcoming the shortcomings of conventional techniques, it equips users with immediate insights and data-driven choices, fostering financial understanding and sustainable stability.

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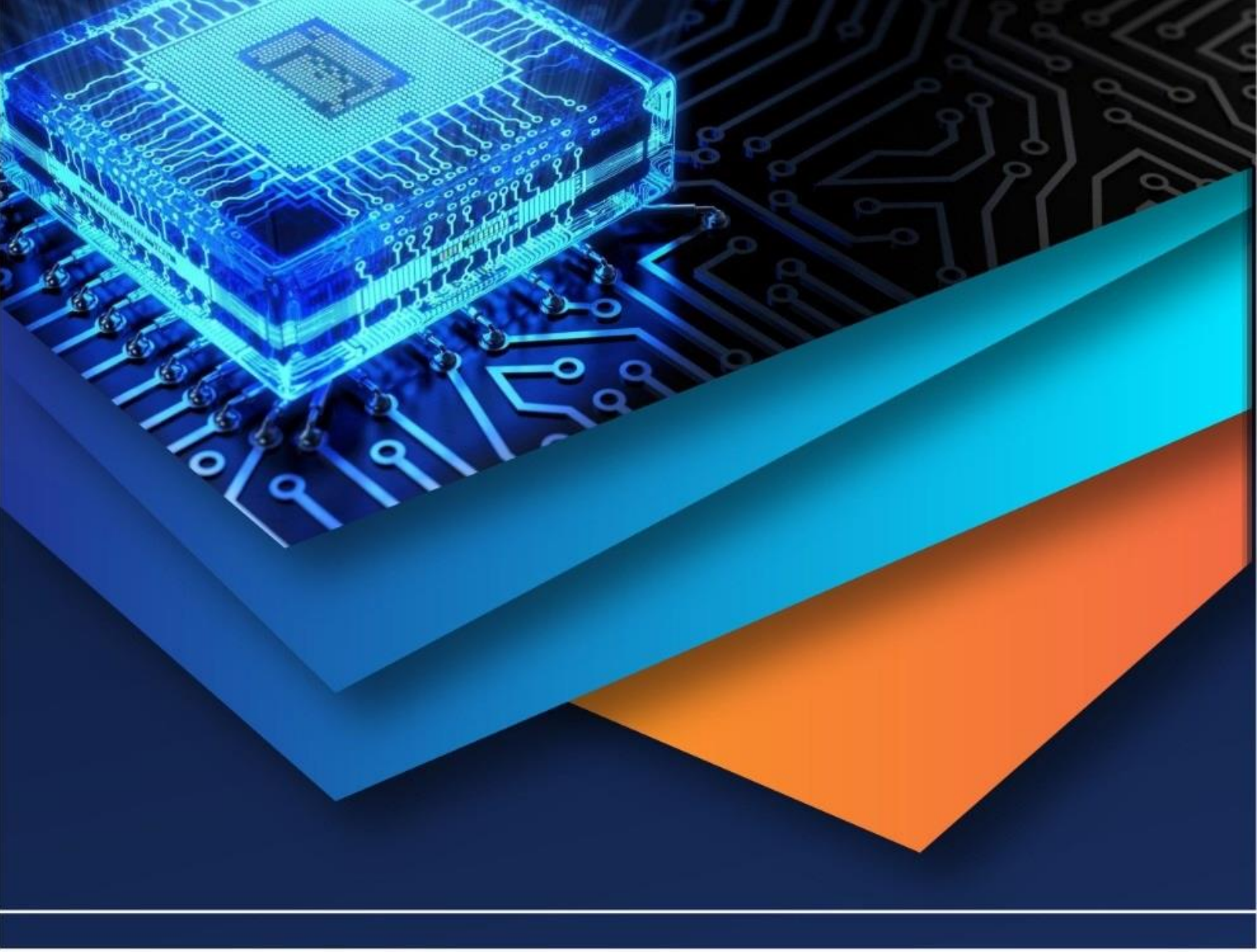

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