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AI POWERED EXPENSE TRACKER WEB APP

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ABSTRACT :

Financial management is crucial for economic well-being in the current digital era. Many people have trouble keeping track of their spending, which results in ineffective budgeting. An AI-powered expense tracker web app is presented in this project to assist users in effectively tracking, managing, and analyzing their expenditure. With its HTML, CSS, JavaScript, React, Node.js, Express, and MongoDB construction, it guarantees a smooth and intuitive user experience. This web application's main objective is to offer safe and individualized financial tracking. A dedicated MongoDB database and collection are provided to each registered user, guaranteeing total data isolation and thwarting unwanted access. In order to preserve privacy, security, and scalability, a special database is made upon registration, and expenses are kept apart. Users can add, remove, and classify expenses using the system's secure user login capability. While the expense page shows recorded expenses depending on chosen dates, the main page allows for quick expense input. Users can monitor their spending over time with the aid of a calendar-based interface. For improved financial insights, users can create visual reports and charts. For smooth spending tracking, the system also incorporates real-time updates. The backend incorporates error handling, validation checks, and effective database operations to guarantee data confidentiality and integrity. The frontend is designed to provide an interactive UI/UX and seamless navigation. The project ensures a dependable experience by addressing issues such as redundant backend queries during registration. This project offers a safe, effective, and AI-driven method of tracking expenses by combining sophisticated data privacy safeguards with customized databases, making financial management easier for users.

KEYWORDS : Budgeting, Digital Expense Management, AI-powered Analysis, Real-time Updates, Secure Authentication, MongoDB Database Isolation, Data Privacy, Expense Categorization, Visual Reports, Calendar-based Tracking, Scalable Architecture, Cloud-based Storage, and Expense Tracking.

I. INTRODUCTION

The ability to handle personal finances is crucial in the fast-paced world of today. People frequently find it difficult to properly track their spending due to the rise in digital transactions, which can result in financial mismanagement. Manual record-keeping and spreadsheet maintenance are two time-consuming and error-prone traditional methods of tracking spending. This web application's main goal is to provide a safe, easy-to-use platform that allows users to keep tabs on their spending while maintaining total privacy and data security. This method guarantees individualized database storage, with each user's financial information kept in a distinct MongoDB database and collection, in contrast to traditional expense monitoring apps. By doing this, any illegal access or data leaks are avoided and user information is kept secure.

Modern web technologies like HTML, CSS, JavaScript, React, Node.js, Express, and MongoDB were used in the system's design. The application is user-friendly thanks to these technologies' dynamic and engaging interface. While the backend safely handles and saves user data, the interface lets users add, remove, and group costs. By choosing a certain day, customers can easily recall past charges thanks to the platform's calendar-based expense tracking mechanism. This project's AI-powered analytics, which divide costs into predetermined categories like food, transit, shopping, and entertainment, is one of its main features. Using graphical reports and charts, users may see their spending trends and make well-informed decisions. One step in encouraging financial literacy and prudent money management is the AI-powered Expense Tracker Web App. It provides customers with the means to effectively monitor, evaluate, and control their spending while guaranteeing a smooth and safe user experience. Future improvements like budgeting tools, cloud-based data storage, and AI-driven financial predictions are possible because to the system's scalable and modular architecture. To sum up, this initiative offers a thorough and creative approach to contemporary financial management. This spending tracker guarantees effective, safe, and intelligent financial tracking by utilizing AI, security protocols, and an intuitive design, assisting users in achieving greater financial stability and control.

II. LITERATURE SURVEY

1. An expense tracker online application has been presented by Aman Garg to help users manage and monitor their personal and company spending. This program assists users with their daily income and expenses. With the aid of the internet, the user would be able to add his or her expenses instantaneously and analyze them at any time or place. Without jeopardizing their information, they can effortlessly import transactions from their mobile wallets, effectively safeguarding their privacy.

2. Atiya Kazi developed an expense tracker software that facilitates user registration and login, allowing users to enter income and spending. In order to recover all the nuances of income and expenses, this will allow you to select classification, category master using SQL, and management view.
3. To keep track of their regular income and expenses, Muskaan Sharma created an expense tracker. They also employ analysis, such as statistical analysis, which is necessary in order to provide consumers with accurate information about their spending and assist them in making better financial decisions.
4. Dhruv Savadia, the creator, Strong functionality for managing expenses across many user levels with different permissions is provided by the PHP expense manager that is being shown. It makes tracking, planning, and possible spending management easier for both individuals and organizations.
5. The Expense Tracker app, created by Arpta Maravi and Omprakash Dewangan, facilitates effective expense logging and classification, spending monitoring, and report generation. It allows tracking on a daily, weekly, monthly, or annual basis and has an easy-to-use interface. By automating monthly reports, the software helps users successfully manage their budgets. It offers a clever way to reach financial objectives.
6. Patel Pallavi has evolved by keeping track of expenditures in areas like food, travel, and entertainment, an expense tracker assists users in managing their money. It lets users create budgets and keep track of their spending and can be a notepad, spreadsheet, or smartphone app. Frequent tracking aids in budget adjustment, spending evaluation, and financial goal achievement.
7. The Know Your Budget software, created by Dr. Pooja Bhatti, tracks daily, weekly, monthly, and annual costs to assist users in managing their money with ease. It has sections for adding expenses, monthly expenses, and bookkeeping, which keeps track of earnings and outlays. The software helps users create budgets and steer clear of financial disasters by offering information through pie charts.
8. The Personal Expense Tracker, created by sakthivel.M, assists users in tracking their spending, keeping tabs on their savings, and getting notifications when their spending exceeds their limitations. It guarantees improved money management and offers financial reports. It helps customers remain on course and save more in the fast-paced world of today.
9. The Expense Tracker is an Android app created by Abhishek Dadhich that assists users in recording daily, weekly, and monthly expenses and classifying spending for improved budgeting. It offers an easily accessible cost history and creates monthly reports with graphical insights. With the help of this program, customers may effectively manage their money and make wise financial decisions.
10. The Student Expense Tracking Application, created by Aisha Khatoon, helps students effectively manage their daily income and expenses by doing away with the need for manual computations. It tracks expenses, serves as a digital journal, and sends out warnings to stop excessive spending. By making money management easier, this program frees up students to concentrate on their professions.

III.METHODOLOGY

Information Gathering:

The web-based interface of the cost tracker allows users to enter information about their expenses, including the amount, category, date, and description. MongoDB is used to store the data, and each user has their own database, guaranteeing security and privacy. For a smooth tracking experience, the system records user interactions, including login credentials and transaction histories.

Information Processing

After being gathered, expense data is processed for effective handling using Express and Node.js. To guarantee correctness and completeness, every transaction is checked. Because the system uses real-time updates, consumers can observe changes to their expenses right away. The data is processed using AI-powered categorization, which then assigns suitable labels according to pre-established categories.

Storage of Data

Each user has a separate database and collection to preserve anonymity, and the spending data is safely saved in MongoDB. To guarantee speedy retrieval and scalability, the system makes use of indexing and optimized queries. To stop loss or unwanted access, data redundancy and security measures like encryption and backup plans are put in place.

Analyzing and Classifying Data

The software uses AI-powered algorithms to group spending into categories such as bills, meals, travel, and shopping. The system analyzes trends over time to give users spending insights. Users may monitor their spending patterns, spot wasteful spending, and establish financial goals with the help of advanced analytics.

Visualization of Data

The system uses technologies like Chart.js or D3.js to create graphical reports and charts for a better user experience. In order to assist users in making well-informed financial decisions, pie charts, bar graphs, and line charts are available for viewing spending trends. Additionally, the system has a calendar-based tracking tool that lets users filter spending by particular dates.

IV.EXISTING SYSTEMS

Manual Monitoring of Expenses

Conventional expense tracking requires users to manually log each transaction on notebooks, spreadsheets, or physical records. Although this approach is straightforward, it lacks automation, takes a long time, and is prone to human error. Financial management is inefficient since users must manually classify expenses and examine spending trends. Furthermore, it is challenging to retrieve historical records, which results in subpar financial decisions.

Simple Apps for Tracking Expenses

Users may record expenses, classify spending, and create reports using a variety of mobile and web applications. However, the majority of these apps require users to manually enter and analyze spending because they lack AI-driven insights and automation. Concerns regarding data security and privacy are also raised by the fact that many apps keep the data of numerous users in a shared database. Because users have little control over their financial information, solutions are less trustworthy.

AI-Powered Apps for Budgeting

AI and machine learning are used by sophisticated budgeting apps like Mint and YNAB to examine user spending and provide financial advice. But the majority of these apps need users to connect their bank accounts, which presents security and privacy issues. Additionally, they use a centralized database structure, which raises the possibility of data breaches and illegal access to consumer financial data.

Existing Systems' Limitations

Real-time insights, anomaly detection for odd spending patterns, and AI-driven financial predictions are absent from the majority of current systems. Many don't provide user-specific database separation, voice-activated expense entry, or customized budget suggestions. Additionally, they are less effective at effectively managing personal funds due to security hazards, data privacy issues, and scalability issues.

V.PROPOSED SYSTEM

AI-Assisted Expense Classification

Using machine learning algorithms, the system automatically classifies expenses according to historical spending patterns. This ensures accuracy and efficiency in financial tracking by doing away with the need for human categorization. AI identifies spending patterns and offers tailored insights to improve users' money management. Expense monitoring becomes easier when the system adjusts to user behavior over time.

Tailored Financial Perspectives

AI creates real-time financial insights and budget suggestions for individuals by examining their spending patterns. The system recommends cost-cutting measures and pinpoints places where spending might be cut. Additionally, it forecasts future expenses based on past transactions, enabling customers to effectively plan their budgets. Gaining greater financial stability is made possible by these insights.

User-Specific Privacy Database

Every user has their own MongoDB database, guaranteeing total privacy and data isolation. All financial records are stored separately in a new database that is generated for the user upon registration. This method improves security and stops unwanted access. This approach removes the possibility of data leaks, in contrast to conventional systems that keep the information of numerous users in a single database.

Safe User Verification

The system employs bcrypt hashing for password protection and JWT authentication for safe user login. High security is ensured by limiting access to financial data to verified users only. RBAC, or role-based access control, is used to prevent unwanted activity. Transactions are protected from outside dangers thanks to data encryption, which further improves security.

Calendar-Based Monitoring of Expenses

By choosing a date on a calendar, users may view previous expenses, which makes keeping track of financial history simpler. A timestamp is appended to every expense, guaranteeing precise transaction recording. Expenses can be filtered by type, amount, and time period using the system. This tool makes financial planning easier and improves user convenience.

Visualization of Expenses Graphically

Pie charts, bar graphs, and spending trends are among the interactive reports that the system creates using Chart.js. Users can better comprehend their financial patterns and pinpoint areas where spending has to be reined in with the aid of these graphic insights. Analyzing financial trends over time is made simpler by the charts' clear depiction of expenses.

VI. ARCHITECTURE EXPLANATION

Web-Based Interface

An interactive and user-friendly platform for tracking expenses is offered by the online interface. It has functions including calendar-based tracking, budgeting, visual analytics, and expense entry. Users can monitor classified spending, create reports, and move between areas with ease. Because of its responsive design, the interface guarantees real-time updates and a seamless user experience.

AI-Powered Suggestions for Expenses

The AI module classifies expenses, examines spending trends, and forecasts future spending. It identifies unnecessary spending and makes budgetary recommendations using machine learning techniques. Additionally, AI provides individualized financial insights by warning consumers about wasteful spending and making recommendations for how to maximize savings.

Alerts and Budget Management

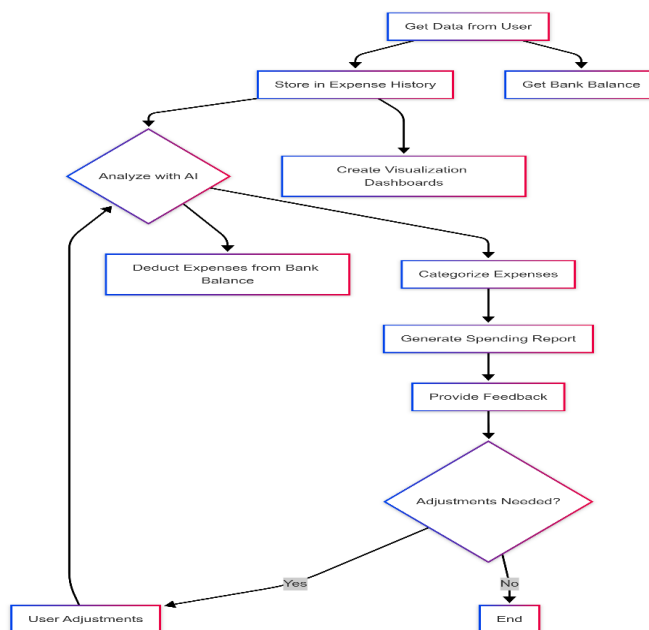
Users can establish spending caps for many categories, including entertainment, travel, and food, using the system. Users are alerted in real time when they are getting close to or going over their budgetary restrictions. By offering recommendations on how to modify their expenditure, the AI-powered budgeting system assists users in maintaining financial discipline.

Analytics and Graphical Reports

Using graphs and charts, the system creates visual reports that present financial facts in an understandable manner. To examine their expenditures, users can explore spending trends, pie charts, and bar graphs. By breaking down spending patterns, the analytics module assists users in finding areas where they can make savings.

Security and Privacy of Data

To avoid unwanted access, each user's financial information is encrypted and segregated. The solution uses encryption techniques, role-based access control (RBAC), and API request validation to guarantee data security and integrity. Frequent data backups guard against corruption or loss.



VII.CONCLUSION

By combining real-time tracking, automation, and AI-driven insights, the AI-powered expense tracker transforms financial management. In contrast to conventional trackers, it improves user comfort by providing voice-activated entry, predictive budget advice, and machine learning-based spending classification. This system's user-specific database structure, which guarantees data security and privacy, is one of its main advantages. Because every user has their own MongoDB database, unwanted access is prevented. Users may examine and optimize their expenditure with the aid of the graphical reports and calendar-based expense tracking system. Users are assisted in maintaining financial discipline by AI-powered budget warnings and advice. With data encryption, RBAC, and JWT authentication, security is given top priority, guaranteeing safe access and storage. Because of the cloud-based deployment's real-time synchronization and multi-device accessibility, customers can easily manage their finances from any location. To sum up, this AI-powered cost tracker offers a safe, clever, and intuitive way to monitor and maximize spending. To make it a complete financial management tool, future enhancements might incorporate multi-user financial planning, banking API connectivity, and investment tracking.

VIII.FUTURE SCOPE

Connectivity to Banking APIs

In order to seamlessly sync transactions from digital wallets, credit cards, and bank accounts, future iterations of the system can interact with banking APIs. This would provide real-time financial tracking and do away with the need for manual expense recording.

Suggestions for Saving and Investing

Based on customer spending patterns, the system can be extended to include savings suggestions and investment tracking. AI could evaluate financial objectives and recommend appropriate investment strategies to optimize asset accumulation and savings.

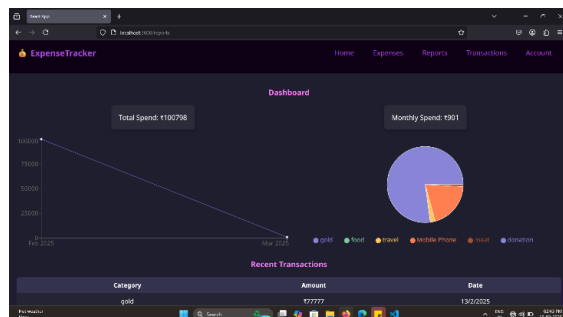
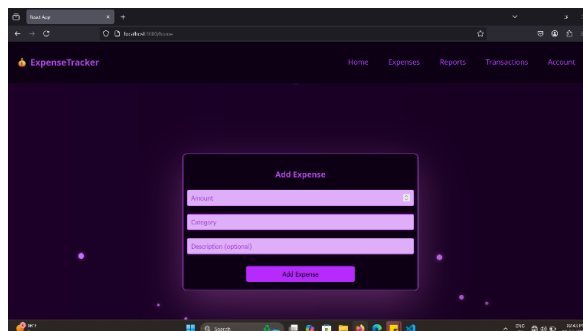
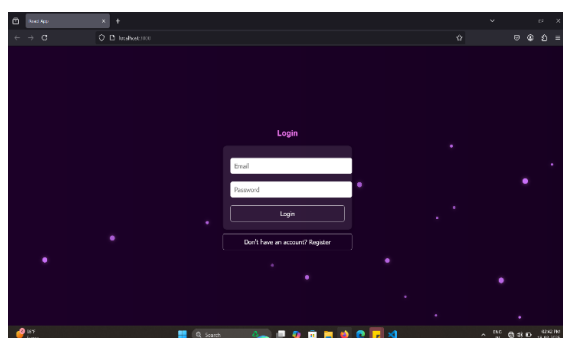
The Financial Planning of Multiple Users

Families or corporate teams could work together to track spending by implementing a shared financial management function. Better financial control and transparency can be ensured by assigning roles to each user with varying access permissions.

Cross-Platform Mobile App

Creating a mobile application for iOS and Android would increase accessibility and allow consumers to handle their spending from any location at any time. Additionally, offline spending tracking with automated cloud syncing could be supported by the app.

IX.RESULT



Category	Expense Amount	Date
gold	177777	13/2/2025
food	120	26/2/2025
travel	11050	25/2/2025
travel	11050	25/2/2025
Mobile Phone	120000	26/2/2025
Travel	1900	3/3/2025
donation	11	3/3/2025

Expenses on 2025-03-18
No expenses recorded for this date.

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