AI POWERED PERSONAL FINANCE AND WEALTH ADVISOR

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Abstract:

The rapid growth of digital payment systems like UPI, debit and credit cards, and online banking has significantly increased the number of financial transactions every day. However, users still struggle to track and manage their expenses efficiently. They face challenges due to disorganized bank SMS notifications and a lack of smart financial analysis tools. FinCortex is a personal finance and wealth advisor app powered by AI, designed to automate expense tracking through SMS transaction detection. The system pulls out essential financial details such as transaction amount, merchant name, date, and transaction type directly from bank SMS messages and sorts them using smart logic and machine learning techniques.

The app includes a secure authentication system with passcode and fingerprint login. It uses Firebase cloud database support for safe and scalable data storage. FinCortex offers real-time dashboard analytics, smart budget monitoring, spending pattern analysis, and personalized financial insights to boost user awareness and financial discipline. By removing manual expense entry and providing automated categorization and predictive insights, the system improves financial decision-making and simplifies personal financial management. This solution shows how artificial intelligence, cloud computing, and mobile app development can come together in today's financial technology systems.

Keywords:

Artificial Intelligence (AI), Financial Technology (FinTech), Expense Tracking System, SMS Transaction Detection, Firebase Cloud Database, Machine Learning (ML), Budget Monitoring, Financial Analytics, Spending Pattern Analysis, Firebase Firestore, Real-Time Dashboard Analytics, Node.js Backend Architecture.

1. INTRODUCTION:

The rapid growth of digital financial technologies has changed the global financial landscape. With more people using the Unified Payments Interface (UPI), debit and credit cards, internet banking, and mobile payment platforms, most financial transactions now happen digitally. This shift has made transactions faster, more accessible, and more convenient. However, it has also created challenges in tracking and managing daily expenses. Users often receive many bank transaction SMS notifications,

but these messages can be chaotic and hard to analyze for valuable financial insights. Traditional methods for managing finances rely mainly on recording expenses manually or checking bank statements from time to time. These methods are often slow, prone to errors, and usually result in incomplete financial records. Many users overlook small daily expenses, which can add up and affect their budgets and savings. Although various banking and budgeting apps are available, most require manual data entry or only provide basic transaction history without smart categorization or predictive analysis. To tackle these issues, we propose the FinCortex application as an AI-powered personal finance and wealth advisor. Its main goal is to automate expense tracking by detecting bank transaction SMS messages. It will extract relevant financial details like the transaction amount, merchant information, type of transaction, and date. The app will categorize these into predefined expense categories using smart logic and machine learning techniques. By removing the need for manual data entry, the system enhances accuracy, efficiency, and user convenience.

The application features secure authentication methods, including passcode and fingerprintbased login, to protect user privacy and data. It also uses Firebase cloud services for secure and scalable data storage, allowing real-time synchronization and dependable financial data management. The system includes an interactive dashboard that shows categorized expenses, spending patterns, and budget monitoring tools to improve user awareness and support informed financial decisions.

FinCortex is not just an expense tracker; it serves as a smart financial assistant that can analyze spending habits, generate financial summaries, and help users stay financially disciplined. By bringing together artificial intelligence, cloud computing, mobile app development, and secure authentication technologies, this proposed system aims to enhance modern financial technology (FinTech) solutions for better personal financial management.

2. LITERATURE SURVEY:

The rise of digital financial transactions has led to significant growth in Financial Technology (FinTech) applications aimed at improving personal finance management. Many studies and commercial tools have tried to make expense tracking simpler, automate transaction sorting, and provide budgeting support. This section reviews existing research and systems related to expense tracking, SMS-based financial monitoring, artificial intelligence in finance, cloud-based financial applications, and secure mobile authentication. Traditional budgeting applications like Mint and other digital banking tools give users expense summaries and visual spending reports. These systems mostly depend on manual expense entry or direct bank account integration through APIs. They provide categorized transaction histories and monthly summaries but often lack automated SMS-based transaction extraction and smart real-time analysis. Research shows that financial tracking systems that rely on manual entry usually lead to lower user engagement and incomplete financial records

because of user dependence and inconsistency. Recent advances in Artificial Intelligence (AI) and Machine Learning (ML) have significantly influenced financial analytics. Various classification algorithms like Decision Trees, Naïve Bayes, Support Vector Machines (SVM), and Artificial Neural Networks (ANN) have been used to categorize financial transactions and forecast future spending. Studies indicate that machine learning-based expense classification improves accuracy and forecasting abilities compared to rule-based systems. However, many of these implementations are still experimental and not fully optimized for real-time mobile app settings. Another important research area explores Natural Language Processing (NLP) techniques to extract structured data from unstructured text messages. Bank transaction SMS messages typically follow semi-structured formats that vary between banks. Researchers have looked at rule-based pattern matching, keyword extraction, and named entity recognition (NER) techniques to identify key information such as transaction amount, merchant name, transaction date, and transaction type. While rule-based systems are simpler to implement, NLP-based models offer more flexibility across different SMS formats, although they require training datasets and computational power. Cloud computing has also become essential in modern financial applications. Platforms like Firebase and AWS provide scalable data storage, real-time database syncing, and secure backend infrastructure. Studies show that cloud-based architectures enhance system reliability, data accessibility, and performance scalability. However, ensuring data privacy and secure authentication remains a major challenge for cloud-integrated financial systems. Security measures in mobile financial applications have advanced with the use of biometric authentication technologies. Fingerprint recognition and multifactor authentication improve data protection and lower the risk of unauthorized access. Research suggests that biometric authentication significantly boosts user trust and application security in financial platforms. Despite these advancements, current solutions often focus solely on specific aspects of financial management, such as budgeting, AI-based classification, or secure authentication. There is little integration of automated SMS-based transaction detection, AI-driven categorization, real-time dashboard analytics, cloud storage, and biometric security within a single unified system.

3. PROBLEM IDENTIFICATION:

The rapid growth of digital financial transactions through UPI, debit and credit cards, net banking, and mobile wallets has changed how people manage their finances. However, despite the convenience of digital payments, individuals still struggle to keep track of and analyze their daily expenses. The main issues identified during the study of current systems are outlined below.

1. **Lack of Automated Expense Tracking** Most users receive multiple bank transaction SMS notifications every day, but these messages tend to be scattered and unorganized. Existing banking apps provide transaction histories, but they do not automatically categorize expenses based on spending patterns. Users must manually check their statements, which takes up time and is not efficient.

2. **Dependency on Manual Data Entry** Many expense management apps rely on users manually entering their transactions.

This method often results in incomplete data because users may forget to record small daily expenses. Manual entry also raises the risk of human error, which lowers the accuracy of financial analysis.

3. **Absence of Intelligent Categorization** Traditional budgeting tools classify transactions using fixed rules. They lack smart logic or machine learning-based categorization that adjusts to users' spending habits. As a result, expense classification can be inaccurate or too general.

4. **Limited Real-Time Financial Insights** Current systems usually provide monthly summaries instead of real-time analytics. Users do not get immediate feedback on overspending or budget limits, which limits their financial awareness and ability to make proactive decisions.

5. **Inadequate Security Measures** Financial data is very sensitive. Some applications do not have strong authentication methods like biometric verification. Weak security practices make unauthorized access and data breaches more likely.

6. **Fragmented Financial Monitoring** Users often use multiple apps to handle different financial tasks, such as banking, budgeting, and expense tracking. The lack of a centralized platform makes financial monitoring complicated and inefficient.

4. METHODOLOGY

1. **Requirement Analysis and System Design**

   The development process began with analyzing the financial challenges faced by users, such as manual expense tracking, unorganized SMS records, and lack of intelligent insights. Based on these observations, the system requirements were defined, including automated SMS detection, AI-based categorization, secure cloud storage, real-time dashboard analytics, and biometric authentication. A modular architecture was designed to ensure scalability and efficiency.

2. **SMS Transaction Detection and Data Extraction** The application accesses bank transaction SMS messages with user permission and identifies financial messages using predefined patterns and keywords. Important transaction details such as amount, merchant name,

transaction type (credit/debit), and date are extracted from semi-structured SMS formats. This automated extraction eliminates the need for manual data entry and improves accuracy.

3. **Intelligent Expense Categorization** After extracting transaction details, the system processes the data through an intelligent categorization module. Transactions are classified into predefined categories such as Food,

Transportation, Shopping, Bills, and Entertainment. The current implementation uses keyword-based logic, while future upgrades aim to integrate machine learning algorithms to enhance classification accuracy and adapt to user spending patterns.

4. **Cloud Database Storage and Integration**

The processed transaction data is securely stored in Firebase Firestore. The database maintains structured collections for users and transactions, ensuring organized storage and quick retrieval. Cloud integration enables real-time synchronization, scalability, and reliable data backup while maintaining data privacy and security.

5. **Dashboard Generation and Security Implementation**

The stored data is analyzed to generate real-time financial insights through an interactive dashboard. The dashboard displays category-wise expense distribution, monthly summaries, and budget tracking analytics. To protect sensitive financial information, the system implements secure authentication mechanisms, including passcode protection and fingerprintbased biometric login.

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5. IMPLEMENTATION:

The FinCortex application is implemented as a mobile-based financial management system integrating frontend development, backend services, cloud database storage, and secure authentication mechanisms. The implementation focuses on automation, security, and real-time performance.

1. **Frontend Development (Android Application):** The user interface of FinCortex is developed using Android (Java). The frontend includes the login screen, passcode and fingerprint authentication setup, dashboard interface, and navigation components. The dashboard displays categorized expenses, spending summaries, and budget tracking analytics in a user-friendly format.

1. **Backend Development (Node.js & Express.js):**

   The backend of the system is developed using Node.js with Express.js to handle API requests, transaction processing, and data communication between the mobile application and the cloud

database. The backend ensures efficient data handling, structured transaction processing, and secure data exchange.

2. **SMS Processing and Transaction Handling:**

The application reads bank transaction SMS messages with user permission and processes them using predefined logic. Transaction details such as amount, merchant name, transaction type, and date are extracted and structured into a standardized format before being stored in the database.

3. **Database Integration (Firebase Firestore):**

Firebase Firestore is used as the cloud database to store user and transaction data securely. The database is structured into collections such as Users and Transactions. Real-time synchronization ensures that the dashboard updates immediately when new transactions are detected.

4. **Security and Authentication Mechanisms:**

To protect sensitive financial data, Firebase Authentication is implemented for user registration and login. Additionally, passcode protection and fingerprint-based biometric authentication are integrated using Android biometric APIs to enhance security and prevent unauthorized access.

❖ CONCLUSION

The FinCortex application is designed as an intelligent and automated personal finance management system that simplifies expense tracking through SMS-based transaction detection. The system eliminates the need for manual data entry by automatically extracting financial transaction details from bank SMS messages and categorizing them into meaningful expense groups using intelligent logic. By integrating artificial intelligence techniques, cloud database support, and secure authentication mechanisms, FinCortex enhances both efficiency and data security.

The application provides real-time dashboard analytics, budget monitoring, and spending pattern analysis, enabling users to gain better control over their financial activities. The implementation of Firebase Firestore ensures scalable and secure data storage, while biometric authentication strengthens user privacy and protection.

❖ FUTURE SCOPE

Although the FinCortex application successfully automates expense tracking and provides intelligent financial insights, several advanced features can be implemented in the future to enhance its functionality, scalability, and accuracy.

a) **Advanced Machine Learning Integration**

Future versions of FinCortex can incorporate advanced machine learning algorithms such as classification models and neural networks for more accurate expense categorization. The system can learn from user behavior and adapt to individual spending patterns, improving prediction accuracy over time.

b) **Natural Language Processing (NLP) for SMS Analysis** Implementing NLP techniques can improve the extraction of transaction details from various bank SMS formats. This will enhance compatibility with multiple banks and increase the robustness of transaction detection.

c) **Personalized Financial Insights and Recommendations**

The system can be enhanced to provide personalized saving suggestions, monthly financial health reports, and predictive alerts for overspending. AI based recommendations can guide users in better investment and budgeting decisions.

d) **Integration with Banking APIs** Future expansion may include direct integration with banking APIs to fetch real-time transaction data securely, eliminating dependency on SMS-based detection and improving data accuracy.

e) **Investment and Credit Management Module**

Additional modules can be developed for tracking investments, managing credit card expenses, monitoring EMIs, and generating debt repayment schedules, making FinCortexcomprehensive financial management platform.

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