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Expense Tracking App with Budget Alerts

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Abstract
The Expense Tracking App with Budget Alerts is a mobile application designed to help users manage their personal finances efficiently. Unlike traditional expense tracking apps that require manual entry of income, expenses, and budgets, this app automatically records transactions using UPI-based payments. When a user makes a payment, such as at a restaurant or store, the app detects the transaction and updates the expense data in real-time. The app also includes a budget alert system: users can set a monthly or weekly budget, and when spending reaches a certain threshold (e.g., 80 percent of the budget), a notification alert is triggered. This automatic tracking and alert system reduce manual effort, promotes financial discipline, and helps users monitor their spending habits effectively. The application is implemented using Android Studio with SQLite as the backend database for storing expense and budget information. Overall, this app provides a convenient, automated, and user-friendly solution for personal expense management.

Keywords—*Expense Tracking, Budget Alerts, Personal Fi- nance Management, Automatic Expense Recording, UPI Integration, Mobile Application*

1. Introduction
Today, keeping track of expenses has become more crucial. With the rise of digital payments and frequent transactions, individuals often find it challenging to monitor their spending patterns and maintain a balanced bud- get. Many people rely on traditional expense tracking methods, such as spreadsheets, notebooks, or manual entry-based mobile applications. These methods are time-consuming, error-prone, and often fail to provide real-time insights, making it difficult for users to manage their finances effectively. Existing mobile expense tracking applications, while popular, often require users to manually input income, expenses, and budget details. This manual approach can lead to incomplete or inaccurate data, resulting in poor budgeting decisions and overspending. Furthermore, while some apps provide reminders or notifications, they lack seamless integration with payment systems, which limits their ability to automatically capture transactions in real-time. The Expense Tracking App with Budget Alerts addresses these limitations by offering an automated, user-friendly solution for personal finance management. The ap- plication captures transactions automatically using UPI-based payments, removing the need for manual entry. Users can define a budget, and the app continuously monitors expenses, triggering real-time notifications when spending reaches a predefined threshold, such as 80 percent of the budget. This proactive alert system promotes financial discipline and helps users make informed decisions about their spending [1-5]. The primary objectives of the application are to: 1. Automate expense tracking to reduce manual effort and increase accuracy. 2. Provide timely budget alerts to prevent overspending. 3. Offer a simple and intuitive interface for all types of users. 4. Store and organize expense data efficiently using a local database (SQLite). By combining automated tracking, real time notifications, and a comprehensive expense overview, the app provides a practical and efficient tool for personal financial management. This application not only reduces the burden of manual expense tracking but also helps users cultivate better financial habits and make data-driven decisions.

2. Literature Review
2.1. Existing Expense Tracking Applications
Mint, Walnut, Money Manager, Spendee, and Pocket Guard are just a few of the mobile apps available to assist consumers in managing their personal finances. These programs include fundamental features including entering revenue and expenses, classifying transactions, and creating reports using graphs and charts. Additionally, a lot of apps have

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features like monthly summaries, bill reminders, and recurring spending [6-10]. Despite their widespread use, these applications mainly rely on human data entry, which can be laborious and prone to mistakes. Inaccurate financial insights may result from users forgetting to report transactions, misclassifying spending, or entering wrong amounts. Additionally, even while these apps offer visual summaries, they frequently fall short of providing real- time notifications that enable users to take prompt action when spending surpasses limits. Some apps attempt to leverage bank account connectivity to automate expense tracking, however these functions are sometimes limited to customers of specific banks or necessitate difficult authorization procedures. As a result, many consumers are unable to fully benefit from automation, particularly those who rely on digital wallets or UPI transactions. One major flaw in current apps is their inability to integrate seamlessly with widely used payment methods.

3. Automation in Expense Tracking (Expanded)

In personal finance technology, automation in tracking expenses has grown in importance. Automated tracking offers real-time expense monitoring, increases data accuracy, and eliminates the need for manual entry. While some apps use APIs to retrieve transactions straight from credit cards or bank accounts, others try to track spending by reading SMS notifications from payment or banking apps. Nevertheless, some automated techniques have drawbacks:

3.1. Bank APIs

These systems frequently require various permissions, are confined to specific banks, and may have delays in updating.

3.2. SMS-based tracking

It may miss transactions or misinterpret the details.

3.3. Privacy concerns

It could prohibit users from linking sensitive bank accounts. The Expense Tracking App with Budget Alerts integrates UPI, a popular payment method in India. The program automatically captures UPI transactions, reducing manual work, providing real-time updates, and enabling a bigger user base without complex banking setup. This app's automation offers a secure and accessible alternative to traditional ways.

4. Budget Alert Systems (Expanded)

Budget management is crucial for personal finance, and alarm systems help prevent overspending. Existing apps offer budget reminders and notifications, but they are generally static and require manual updates. Users may not receive timely notifications if they exceed a spending limit. A proactive budget alerting system should:

- Continuously monitor your expenses.
- Provide clear and actionable information for users to adjust spending promptly. The Expense Tracking App with Budget Alerts implements this system. Users can set budgets for specific categories or total expenses, and the app tracks spending in real-time. When spending hits a certain level (e.g., 80 percent), a notice alert is provided promptly, allowing users to take corrective action.
- Real-time feedback is more effective than manual checks and promotes financial discipline.

5. Advantages of The Proposed App (Expanded)

The suggested app improves spending tracking by integra- ting automation, real-time notifications, and an easy-to-use UI. Key benefits include:

5.1. Automatic Transaction Recording

Using UPI payments, the software automatically registers spending, reducing manual entry and human mistake.

5.2. Real-Time Budget Alerts User-Friendly Interface

The software analyzes expenditure and alerts users when predefined budgets are met, allowing for better expense management.

5.3. User-Friendly Interface

The software, created in Android Studio, has an elegant interface for fast navigation, category administration, and budget creation.

5.4. Local Data Storage

SQLite securely stores expense and budget data, enabling offline access and quick retrieval of financial records.

5.5. Customizable Budgets

Users can create budgets for several areas, such as food, transportation, and leisure, enabling flexible financial planning.

5.6. Visual Analytics

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The program may generate charts and summaries to quickly analyze spending patterns and trends over time. The app's integration of these functions provides a comprehensive personal finance management solution that improves accuracy, minimizes human work, and increases financial awareness. This app is unique in that it combines automation and proactive budgeting, making it particularly useful for customers who rely significantly on digital payments like UPI.

6. System Architecture

The mobile app features a client-side interface and a local SQLite database for data storage. The system is modular, with each component performing a specialized purpose.

6.1. User Interface (UI):

- Created with Android Studio.
- Users may enter/view spending, create budgets, and receive notifications.
- Created to be simple, straightforward, and responsive.

6.2. Expense Processing Module:

- Automatically collects and records UPI transactions.
- Classifies each transaction (food, travel, entertainment, etc.).

6.3. Budget Monitoring Module:

- Continuously monitors spending and compares it to user-defined budgets.
- Sends real-time messages when thresholds (e.g., 80 % of budget) are met.

6.4. Database Module:

- Uses SQLite for safe storage of costs, budgets, and user information.
- Allows offline access.

6.5. Notification Module:

- Provides push notifications for budget alerts.

7. System Modules

7.1. Expense Entry Module:

- UPI transactions are recorded automatically.
- Allows for manual input of non-UPI expenditures. Categorizes expenses for reporting.

7.2. Budgeting Module:

- Users can create total or category-based budgets.
- Tracks cumulative spending and determines the proportion of budget consumed.

7.3. Alert/Notification Module

- Sends notifications based on thresholds (50, 80, and 100 percent).
- Alerts are displayed on the user's smartphone in real time.

7.4. Reporting Module:

- Creates charts and graphs for weekly/monthly expenses.
- Assists users in understanding their spending habits and making informed decisions.

8. Feature / Functional Requirements

- Automatically record UPI transactions.
- Manually enter expenses for non-UPI payments. Real-time budget notifications.
- Category-based reports
- Secure local storage using SQLite User-friendly interface.

9. List of Modules

9.1.User Authentication Module

The User & Security Module refers to users who interact with the expense tracking system. Users can register, log in, and securely manage their financial information. This module restricts access to cost, revenue, and budget information, ensuring user privacy and security. The key features are:

- Authentication allows for secure user registration and login.
- Protecting personal and financial information from illegal access.
- Users can securely manage their costs, income, budgets, and reports.
- Protects data privacy with safe storage and access controls.

9.2. Income & Expense Management Module

The Income & Expense Management Module is the system's basic financial handling component. It enables users to record, update, and manage their income and expense information depending on their daily financial transactions [11-15]. This module enables accurate transaction tracking and provides

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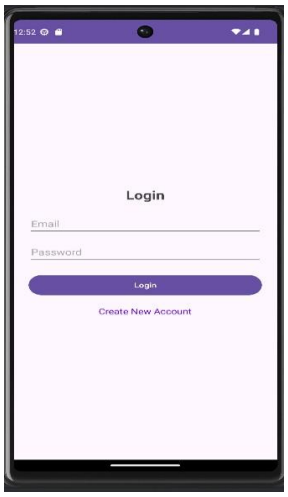

Figure 1 User Module

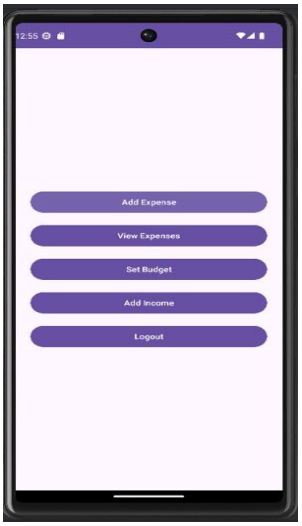

Figure 2 Income & expense module

users with a clear snapshot of their financial situation shown in Figure 1 and 2. The key features are:

- Ensure accurate record-keeping for revenue and expenses.
- Expense categories include food, travel, utilities, and entertainment.
- Edit and delete transactions as needed. Automatic calculation of total revenue, total expenses, and remaining balance.
- Organized transaction facts such as date, amount, cate- gory, and description.

9.3. Budget & Alert Module

The Budget & Alert Module allows users to plan and monitor their expenditure by establishing specified budget limitations. This module continuously monitors expenses in real time and alerts users when they approach or surpass the budgeted amount, assisting them in maintaining financial discipline. The key features are:

- Establish and monitor monthly and category-specific budgets.
- Track expenses in real-time against budget restrictions.
- Receive automatic alerts and notifications for spending that meets or exceeds budget.
- Use visual indicators to track budget utilization and remaining balance.
- Enables people to make informed spending decisions and prevent overspending.

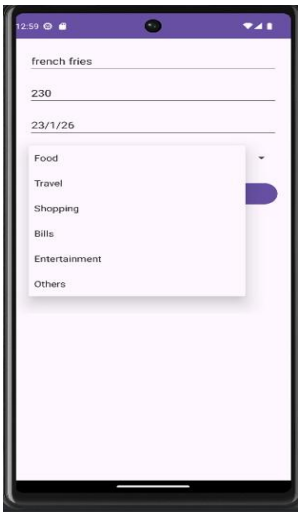

Figure 3 Budget & Alert Module

9.4. The Reports and Analysis Module

The Reports and Analysis Module generate useful insights from the application's financial data. This module examines recorded income and cost transactions and produces visual representations such as charts and summary reports. These visual reports assist users analyze their spending habits over time. The module offers daily, weekly, and monthly spending summaries. It divides spending into categories such as food, transportation, utilities, and entertainment, allowing users to quickly determine where they spend the most. By presenting this information graphically, the system allows users to track their financial habits and make smart budgeting decisions. Key Features Include:

- Prepare daily, weekly, and monthly financial reports.

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- Use charts and graphs to visualize expenditure patterns.
- Expense analysis by category.
- Identification of high-cost regions for better financial planning.
- To gain a better knowledge of finances, export or use summary views.

9.5. Data Storage & Backup Module

The Data Storage and Backup Module guarantee the se- cure storage and protection of user financial information. All transaction records, user information, budgets, and reports are saved in a local SQLite database. SQLite was chosen for its lightweight architecture, high performance, and interoperability with Android applications. This module ensures that financial data is secure and accessible even when the device is not connected. Encryption techniques are used to protect sensitive user information and prevent illegal access. Regular data backups help to prevent data loss and maintain system stability. Key Features Include:

- Transaction and user data are securely stored.
- Simple SQLite database integration.
- Fast retrieval and update of financial records.
- Data encryption protects sensitive financial information.
- Methods for backing up data to avoid inadvertent loss.

9.6. Settings & Profile Management Module

Users can use the Settings and Profile Management Module to manage their account information and customize application preferences. This module allows users to edit personal information such as their username, email address, and password. Users can also change the notification settings for budget alerts and reminders. The module enables users to tailor categories, currency preferences, and other program settings to their financial needs. Key Features Include:

- Manage user profiles and change account information.
- Password and security management.
- Customize alert and reminder notifications.
- Managing categories and preferences.
- 5. Enable secure logout and session management.

10. System Implementation

The Expense Tracking App with Budget Alerts is built as an Android mobile app with Android Studio as the development environment. The user interface is designed with XML layouts, while the fundamental application functionality is written in Java [16-20]. The system incorporates several modules, including spending tracking, budget monitoring, notifications, and reporting. SQLite serves as the local database for storing financial records such transactions, budgets, and user data. The application also includes UPI transaction monitoring, which automatically captures payment actions. The implementation emphasizes simplicity, efficiency, and security. The modular architecture ensures that each system component performs a specified role, which increases maintainability and scalability of the application.

11. Results and Discussion

The application was tested with numerous users to determine its usefulness in tracking costs and generating budget alerts. The test results show that the system correctly records transactions, categorizes expenses, and sends notifications when specified spending limitations are exceeded. The automated tracking feature considerably minimizes the need for manual entry, resulting in fewer errors. Real-time notifications enable consumers to keep informed of their financial situation and avoid overpaying. Furthermore, the reporting section offers clear visual insights into spending habits, allowing customers to make more informed financial decisions. When compared to existing expense tracking approaches, the suggested system provides greater accuracy, faster data processing, and increased user convenience.

12. Future Enhancements

Although the existing system is effective for spending tracking and budget monitoring, various enhancements can be made in the future. Future developments could include connectivity with bank APIs for seamless transaction synchronization, cloud-based storage for multi-device access, and artificial intelligence for intelligent expense classification and forecasting. Biometric authentication, such as fingerprint or facial recognition, can also be used to increase security. Another potential enhancement is the inclusion of financial advisory capabilities that offer

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individualized budgeting re- commendations based on user spending habits.

Conclusion

In this work, a mobile-based Expense Tracking Application with Budget Alerts is proposed to assist users in managing their personal money. The solution automates expense recording via UPI transactions and sends real-time notifications when spending approaches predefined budget restrictions. By combining automation, real-time monitoring, and visual analytics, the program reduces human effort while increasing user financial awareness. SQLite provides secure and efficient data storage, while the modular system architecture improves system stability and scalability. Overall, the proposed solution is a useful and effective tool for modern financial management, allowing users to better control their spending patterns.

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