

Personal Expense Tracker Application

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Abstract—In today’s busy, high-priced world, people often find themselves struggling to make ends meet after having spent all their time chasing money. Unwittingly they allow money to slide through their fingers by spending on superficial and unnecessary things. To understand this problem there is a compelling requirement of a reliable system that will help in keeping track of earnings and spending. To this end, the personal expense tracker acts as an effective tool to address this issue, providing customers with an easy way to record, monitor and save all their recurrent expenditures with minimal effort. With its simple interface and timely notifications, it leads the users into a deep insight about how they handle finances shaping them up into better financial managers who can make well informed decisions. The personal expense tracker helps individuals work towards their financial targets while maintaining balanced budgets as it reveals spending habits and encourages wise financial behaviors. Basically, it is a guiding friend that takes you from poverty to financial independence; subsequently enabling you breathe easily in today's tough world filled with endless demands for us to spend more than we actually have.

Index Terms—Personal Expense Tracker, Money, Earning, Spending, Expenditure, Budget

INTRODUCTION

In this rapidly changing world, keeping track of our finances is not an easy task. Never mind that we are bombarded with expenses, from bills to groceries and entertainment. At such times, it is the Personal Expense Tracker that comes in handy. That’s like you’ve got a personal finance assistant in your pocket. This web app does a lot of the heavy lifting for you. One of its coolest features is its ability to automatically categorize your expenses into categories, using machine learning technology. This means you don't have to spend hours tediously sorting through receipts and transactions – the app does it for you, saving you time and hassle. The Personal Expense Tracker

doesn’t just stop there but also it can be seen as quite smart when it comes to forecasting what one may spend on in future. By studying your spending habits over time, it will let you know what you will spend in future to plan for ahead of time. Whether it's a big purchase like a vacation or just your monthly bills, the app helps you plan ahead so you're never caught off guard. And speaking of planning, the app also lets you set and track your financial goals. Whether you're saving up for a new car or trying to pay off debt, the Personal Expense Tracker helps you stay focused and motivated. It breaks down your goals into manageable steps and tracks your progress along the way, so you always know how you're doing. Plus, the app sends you reminders and notifications to keep you on track. Whether it's a weekly report on your spending or a friendly alert when you're getting close to your daily spending limit, the app makes sure you're always in the loop if you exceed the daily spending limit it sends quick alert notification to user. Shortly, the Personal Expense Tracker is like having a financial guru in your pocket. It helps you manage your money, plan your budget, and reach your financial goals – all with just a few taps on your phone.

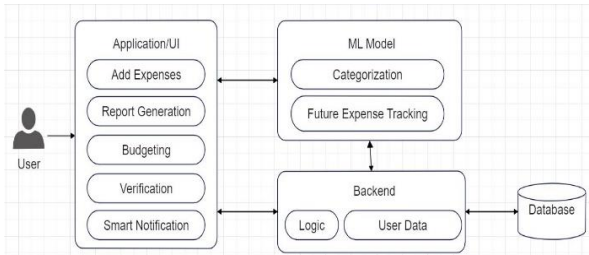
METHODOLOGY

Personal Expense Tracker is a web application that is deployed on a server. It is having the client-server type of architecture. Frontend and Backend are communicating through request and response. Users can interact with the system by selecting options from the front end. Database layer consists all the data stored of the application. ML Model Layer consists the machine learning model API’s which provide the automation and predicting functionalities to the application. Backend layer deals with all the business logic of the application. Below System Architecture

depicts the details of components and modules used in the personal expense tracker application.

Automated Expense Categorization

Automated Expense Categorization categorizes expenses based on the expense description given by the user. For the purpose of predicting the category of expenses it uses the Random Forest Classifier machine learning algorithm. The steps involved in the predicting the category of expenses are First expense description is sent to API then cleaning and

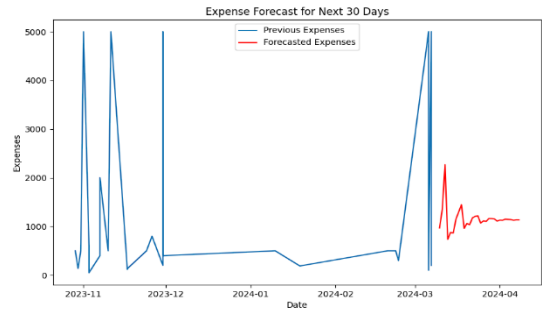


tokenization of expense description is performed by the algorithm it involves removing any unwanted data from the description like white spaces, commas, semicolons. Then the algorithm generated the ensemble of decision trees and it measures the cosine similarity with the category and it returns the category with maximum cosine similarity is obtained.

Future Expense Prediction

Future Expense Prediction predicts the future expenses based on the user's historical expense data. It aligns with the trends and changes occurring in spending pattern of the user. It will help user to know the expenses he is going to make in the future. User can plan his budget according to that for better budgeting in future. For the purpose of future expenses prediction ARIMA model is used ARIMA is Auto Regressive Integrated Moving averages it is time series forecasting model which analyzes historical expense data to predict the future expenses accurately, making it ideal for financial planning. ARIMA is versatile predictor it is adaptable to various expense prediction scenarios. It easily accommodates with the seasonal trends and diverse data in expenses. Steps involved the future expense prediction are first the user's historical expense data is taken, that data is preprocessed before feeding to the model the ARIMA model visualizes the data and identify patterns based

on the pattern ARIMA model predicts the future expenses of the user.



II. MODELING AND ANALYSIS

1. User authentication and profile management: This module facilitates user registration, login, authentication and profile management. On registration the token-based hyperlink is sent to the user until user activates his account from that account, he is not able to login into his account. On activation of account user is able to manage his profile and get access to the application.
2. Expense Entry: Here user can input his expenses which involves details like amount, expense description, on entering expense description the machine learning API is called which predicts the category of that expense.
3. Future Expense Prediction: This section shows the category wise future expenses of the user. It also shows graph depicting the expenses user is going to made in future.
4. Income Summary: This shows the user dashboard of income he has earned it shows the dashboard consisting daily, weekly and yearly income of the user. It also shows the early expense detail of the user.
5. Data visualization: This shows user's income and expense data in form of graph and charts. For expenses pie chart shows the category wise expense user has made.
6. Reports: This page shows the income and expense reports of the user. User is able to provide the duration for which he wants to gain the report. The reports generated shows the total income and expenses of the user and also shows status like he has overspend or saved money.
7. Goal Setting and Tracking: This page helps to user to set his financial goals he wants to achieve;

it shows how much user should save daily in order to achieve his goals. It also shows how much percent goal is achieved till now.

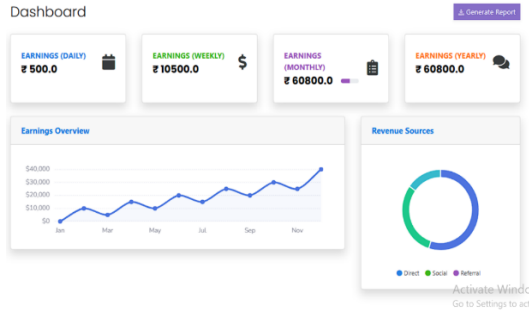
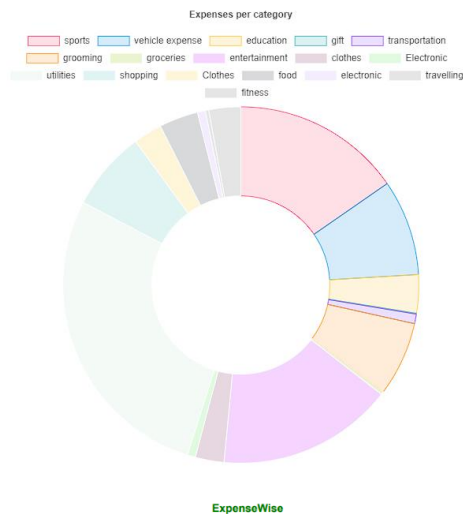


FIG: INCOME DASHBOARD

RESULTS AND DISCUSSION

Depiction of Expense Summary in form of pie chart
Below figure shows the pie chart having category wise expenses of a user



Expense Report

Total Income:

Date	Source	Amount
Feb 24, 2024	Youtube Income	500.0
March 7, 2024	Income	28000.0

Total Expenses:

Date	Category	Amount
Jan 10, 2024	food	500.0
Jan 10, 2024	travelling	189.0
Feb 20, 2024	food	500.0
Feb 23, 2024	food	500.0
Feb 24, 2024	utilities	300.0
March 8, 2024	entertainment	5001.0
March 8, 2024	grooming	100.0
March 7, 2024	entertainment	5001.0
March 7, 2024	grooming	200.0

Savings:

Total Income:	28500.0
Total Expenses:	12291.0
Total Savings:	16209.0
Status:	You saved money this period.

FIG: Expense Report pdf format

Above Expense report format shows the total income and total expenses. It also shows the status at the end which shows the status of income and expenses

whether user has saved money or overspend the money in given duration.

CONCLUSION

The personal expense tracker app, built and featuring expense categorization and machine learning for future expense prediction, promises to be a game-changer in how we manage our money. Its convenience and data-driven insights empower users to make informed financial choices. While challenges may arise, this app aligns perfectly with the growing need for digital tools that simplify financial management. With thoughtful planning and an eye on user needs, it has the potential to redefine personal finance management, making it more accessible, efficient, and empowering for everyone.

ACKNOWLEDGEMENTS

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