



NAME :

ROLL NO :

CONTACT NO :

BATCH NO :

EMAIL-ID :

Company project : YES / NO

TITLE OF THE PROJECT :

Guide Name and Designation:
Institution:

REMARKS (by Project Monitoring Committee)

RECOMMENDED / NOT RECOMMENDED TO PROCEED WITH THE PROJECT

Over all system design : 10	Modules completed with screen shots : 30	Data Set :15	Pseudo code for incompleted Modules : 5	Contribution : 10	<i>Total:70 Marks</i>

Signature of the PMC Member

Second Review Report

(Submitted by Candidate's Name: Meenavarsni.M, Roll No:2028MCA0020 Reg.No:67220200042)

Title of the Project: Automated Real-Time Expense Tracker using Flutter and Linear Regression

Over all system design:

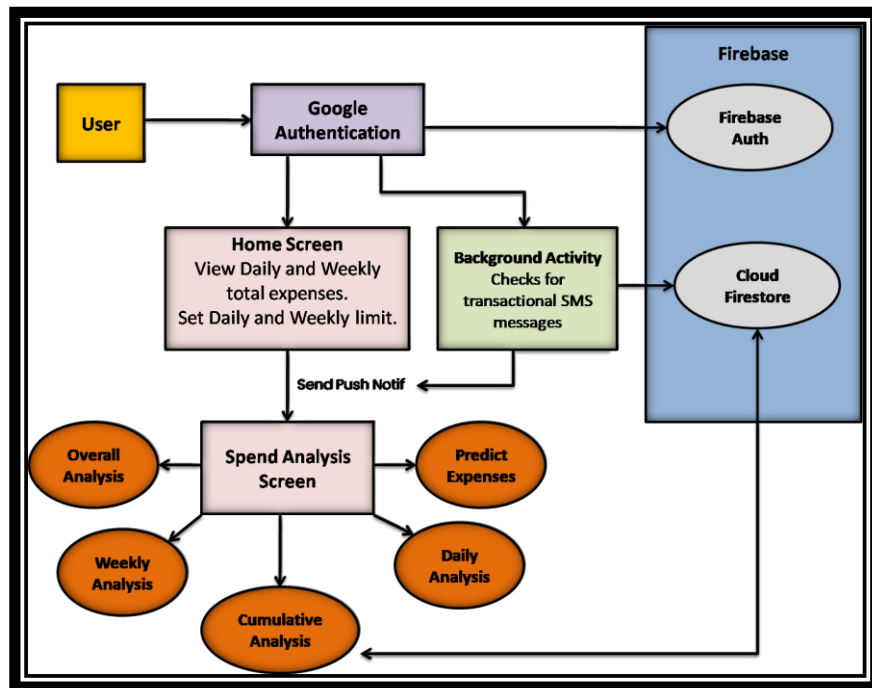


Fig No 1: Architecture diagram of the application

The goal of this project is to create an expense tracking application with a feature that allow users to set a spending limit above which, if the user spends, the user will get an alert notification. The additional feature is that to analyze the transactions made and to predict the user's future expenses using Machine Learning. Most importantly, the app would function perfectly even when the app is closed and is running in the background.

Software Requirements:

- Flutter
- Visual Studio Code (Any IDE)
- Android Studio
- A registered Google Account
- A Firebase account to manage your Console
- Java SE Development kit (version 8 or above)
- A mobile device to test with the developer option enabled
- Git

Dependencies Used:

- cupertino_icons
- telephony
- google_sign_in
- cloud_firestore
- uuid
- flutter_local_notifications
- flutter_background
- fl_chart
- charts_flutter

Modules completed with screenshots:

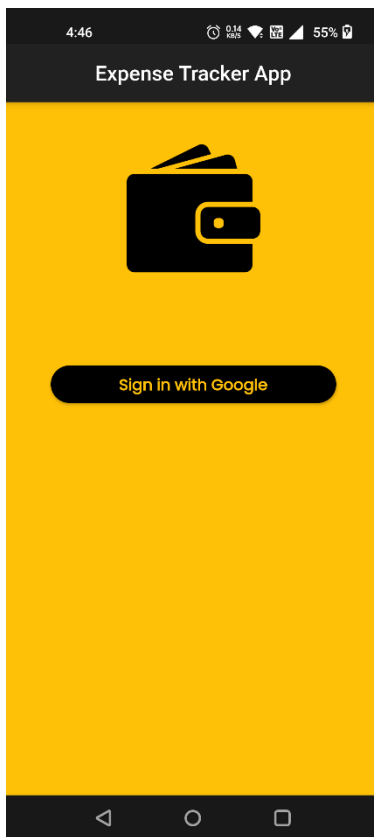


Fig No 2: Home Screen

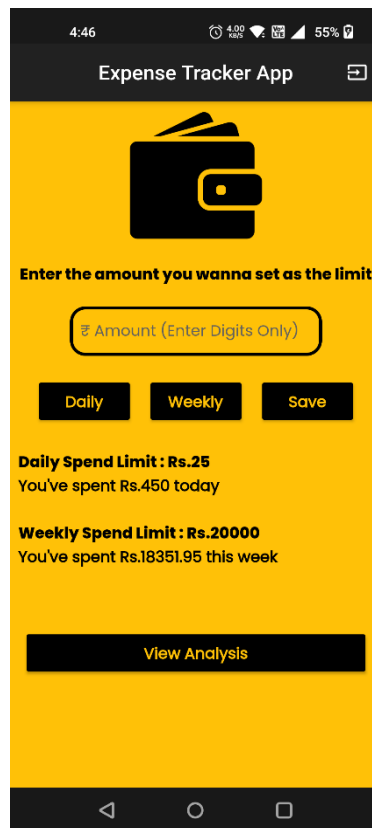


Fig No 3: Dashboard

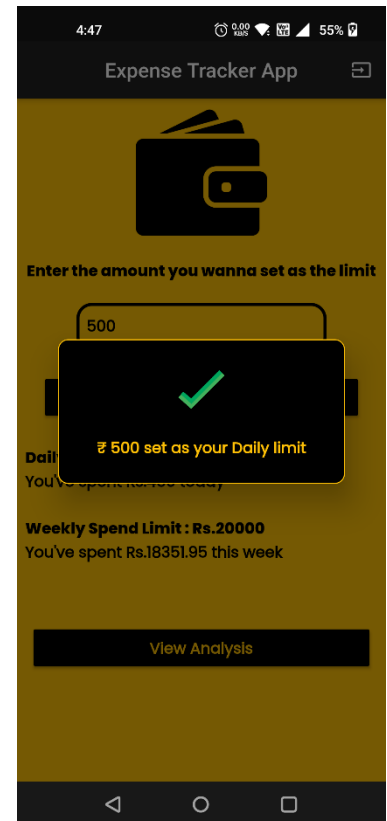


Fig No 4: Pop-up Alert



Fig No 5: Expense Analysis

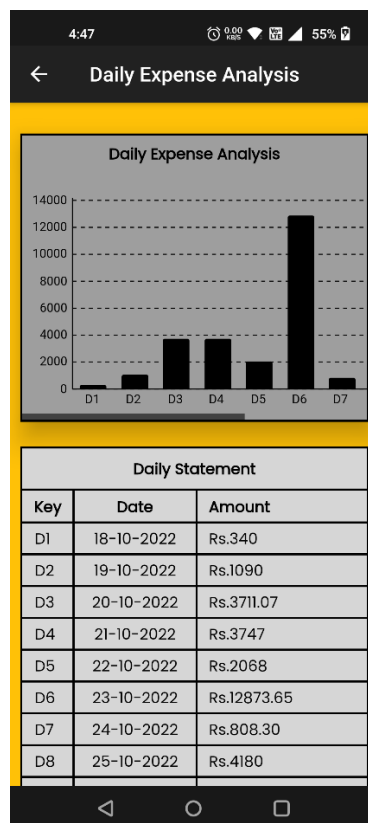


Fig No 6: Daily Expense Analysis

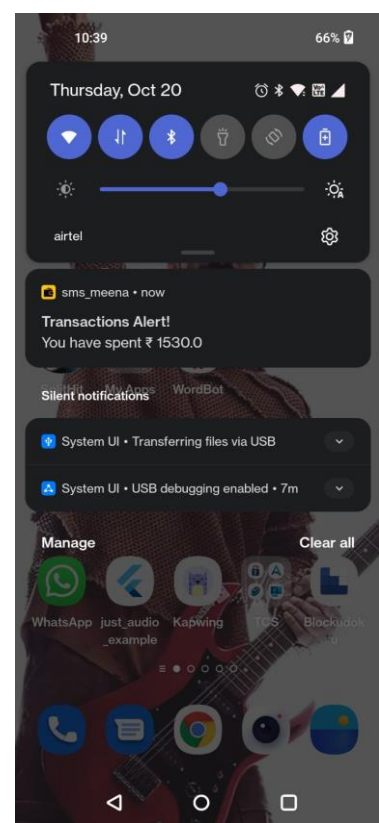


Fig No 7: Transaction Alert

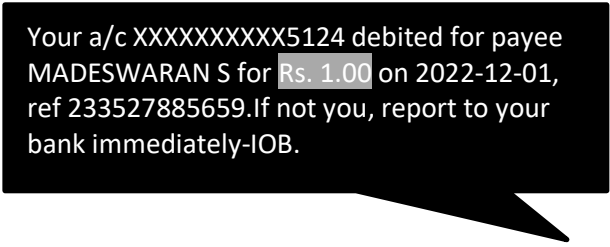
- App name: SpenTrak
- Framework: Flutter
- Platform: Android
- Build Version: 1.0.1

Data Set:

A few of the training data for the possible transactional messages are as follows:

- An amount of INR 220.00 has been DEBITED to your account XXXX4230 on 30/11/2022. Total Avail.bal INR 50.25. - Canara Bank
- Your LVB a/c no. XXXXXXXXXXXXX2319 is debited for Rs.5460.0 on 01-12-22 (UPI Ref no 233501822886).
- Dear SBI User, your A/c X8298-debited by Rs3000.0 on 28Nov22 transfer to Ms Linda Dharmaraj Ref No 233233440339. If not done by u, fwd this SMS to 9223008333/Call 1800111109 or 09449112211 to block UPI -SBI
- Your VPA muthunagappan@paytm linked to Indian Bank a/c no. XXXXXX0504 is debited for Rs.1000.00 and credited to 918428835116@PYTM0123456.ifsc.npci (UPI Ref no 230979553607).-Indian Bank
- Your a/c XXXXXXXXXXXX5124 debited for payee MADESWARAN S for Rs. 1.00 on 2022-12-01, ref 233527885659.If not you, report to your bank immediately-IOB.

The SMS that we need to retrieve would be in this format and none of the values will be same all the time whether it's the spent amount, or the recipient UPI ID or the balance amount or even the bank name because different users would be using different bank accounts. So, the one thing that's common is the key phrase – “**is debited from**”. So, from the above message, the spent amount would be extracted in the following way:



Your a/c XXXXXXXXXX5124 debited for payee
MADESWARAN S for Rs. 1.00 on 2022-12-01,
ref 233527885659.If not you, report to your
bank immediately-IOB.

Pseudo code for in-completed Modules:

The third phase of this project is to implement an ML algorithm to predict the user's spending pattern and predict the user's future expenses. The predicting pattern that seemed apt for this problem statement is Linear Regression.

The algorithm designed to perform Linear Regression on the user's expense analysis is:

```
import 'dart:math';

regress(List x, List y) {
  var n = y.length;
  num sx = 0;
  num sy = 0;
  num sxy = 0;
  num sxx = 0;
  num syy = 0;
  for (var i = 0; i < n; i++) {
    sx = sx + x[i];           // sum of x values
    sy = sy + y[i];           // sum of y values
    sxy = sxy + x[i] * y[i];   // sum of xy values
    sxx = sxx + x[i] * x[i];    // sum of x2 values
    syy = syy + y[i] * y[i];    // sum of y2 values
  }
  var mx = sx / n;             // sum of x values - mean
  var my = sy / n;             // sum of y values - mean
  var yy = n * syy - sy * sy;   // n(sum of y2 values) - (sum of y values)2
  var xx = n * sxx - sx * sx;   // n(sum of x2 values) - (sum of x values)2
  var xy = n * sxy - sx * sy;   // n(sum of xy values) - (sum of x values)(sum of y values)
  var slope = xy / xx;
  var intercept = my - slope * mx;

  return {"slope": slope, "intercept": intercept};
}
```

Project Work Plan:

PROJECT WORK PLAN		
WORK	STATUS	TIMELINE
Literature survey	Completed	-
Create model	Completed	-
User interface	Completed	-
User login/signup page	Completed	-
Firebase configuration	Completed	-
Implementing <i>telephony</i> package	Completed	-
Enabling push notifications	Completed	-
Enabling background services	Completed	-
Statistical Analysis	Completed	-
Linear Regression	In Progress	2 weeks

References:

- [1] Adepegba, O. A., Fayemiwo, M.A., Oduwole, O. A. & Onamade A. A, "An Android Based Mobile Application for Tracking Daily Expenses" at Global Ecosystem for Nurturing Multidisciplinary Research Innovations, January 2019, pp.97-112.
- [2] Velmurugan A, Albert Mayan J, Niranjana P & Richard Francis, "Expense Manager Application" at Journal of Physics Conference Series 1712(1):012039, December 2020, pp.1-8.
- [3] Prof Miriam Thomas, Lekshmi P, & Dr. Mahalekshmi T, "Expense Tracker", International Journal of Advanced Research in Science, Communication and Technology (IJARSCT), September 2020, pp.5-9.
- [4] Uday Pratap Singh, Aakash Kumar Gupta & Dr B. Balamurugan, "Spending Tracker: A Smart Approach to Track Daily", Turkish Journal of Computer and Mathematics Education, April 2021, pp.5095-5103.
- [5] Angad Manchanda of San Diego State University, "EXPENSE TRACKER MOBILE APPLICATION", A Thesis Presented to the Faculty of San Diego State University, December 2012, pp.1-70.
- [6] Li Lyna Zhang, Chieh-Jan Mike Liang, Yunxin Liu & Enhong Chen, "Systematically Testing Background Services of Mobile Apps", ASE 2017, Urbana-Champaign, IL, USA Technical Research, IEEE 2017, pp.4-15.
- [7] Ademola O. Adesina, Kehinde K. Agbele, Ademola P. Abidoye & Henry O. Nyongesa, "Text messaging and retrieval techniques for a mobile health information system", Journal of Information Science 40(6):736-748, December 2014, pp.1-13.
- [8] Akshay Jadhav, Avinash Chaudhary, Vikrant Hande & Mahi Khemchandani, "Android App for Retrieve Mobile Contacts, SMS, Unread Calls", International Journal for Research in Engineering Application & Management (IJREAM) ISSN : 2494-9150 Vol-01, Issue 10, January 2016, pp.1-6.
- [9] Khushbu Kumari, Suniti Yadav, "Linear Regression Analysis Study", Journal of the Practice of Cardiovascular Sciences Vol-04, Issue 1, May 2018, pp.33-36.
- [10] Mathias Holm, "Machine learning and spending patterns - A study on the possibility of identifying riskily spending behaviour", December 2017, pp.1-82.

(SIGNATURE OF THE STUDENT)

(SIGNATURE OF THE GUIDE)