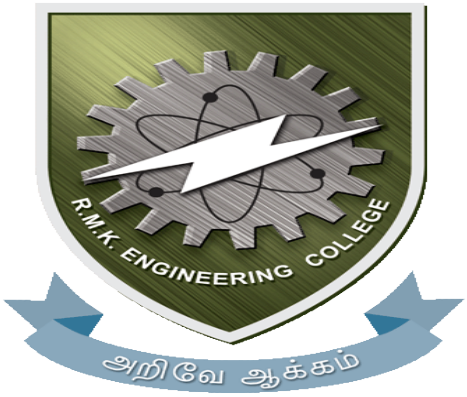
PNT2022TMID15737



RMK ENGINEERING COLLEGE

(An Autonomous Institution)

R.S.M. Nagar, Kivaraipettai-601 206, Gummidipoondi Taluk, Thiruvallur dist .

PROJECT

PERSONAL EXPENSE TRACKER APPLICATION

DONE BY

TEAM ID: PNT2022TMID15737

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INDEX

1. INTRODUCTION

1.1 Project Overview

1.2 Purpose

2. LITERATURE SURVEY

2.1 Existing problem
2.2 References

2.3 Problem Statement Definition

3. IDEATION & PROPOSED SOLUTION

a. Empathy Map Canvas

b. Ideation & Brainstorming

c. Proposed Solution

d. Problem Solution fit

4. REQUIREMENT ANALYSIS

a. Functional requirement

b. Non-Functional requirements

2. PROJECT DESIGN

a. Data Flow Diagrams

b. Solution & Technical Architecture

c. User Stories

2. PROJECT PLANNING & SCHEDULING

a. Sprint Planning & Estimation

b. Sprint Delivery Schedule

c. Reports from JIRA

2. CODING & SOLUTIONING (Explain the features added in the project along with code)

a. Feature 1

b. Feature 2

c. Database Schema (if Applicable)

8. TESTING

a. Test Cases

b. User Acceptance Testing

2. RESULTS

a. Performance Metrics

10. ADVANTAGES & DISADVANTAGES

11. CONCLUSION

12. FUTURE SCOPE

13. APPENDIX

Source Code

GitHub & Project Demo Link

PNT2022TMID09631

1. INTRODUCTION

a. Project Overview

TEAM ID : PNT2022TMID15737

FACULTY MENTOR : P ILAMPIRAY

Skills Required:

IBM Cloud, HTML, Javascript, IBM Cloud Object Storage, Python- Flask, Kubernetes, Docker, IBM DB2, IBM Container Registry

1. INTRODUCTION

a. Project Overview

This project is based on expense tracking.This project aims to create an easy,faster and smooth cloud application .For better expense tracking we developed our project that will help the users a lot.Most of the people cannot track their expenses and income leading to facing money crisis,so this application can help people to track their expense day to day and make life stress free.Money is the most valuable portion of our daily life and without money we will not last one day on earth.So using the daily expense tracker application is important to lead a happy family.It helps the user to avoid unexpected expenses and bad financial situations.It will save time and provide a responsible lifestyle.

b. Purpose

Personal finance management is an important part of people’slives. Ho wever, everyonedoes not have the knowledge or time to manage their finances in a proper manner. And, even if a person has time and knowledge, they do not bother with tracking their expenses as they find it tedious and time-consuming. Now, you don’t have to worry about managing your expenses, as you can get access to an expense tracker that will help in the active management of your finances.Also known as expense managerand money manager,an expense trackeris a software

or application that helps to keep an accurate record of your money inflow and outflow. Many people in India live on a fixed income, and they find that towardsthe end of the month t hey don'thave sufficient money to meet theirneeds. While this problem can arise due to low sal ary, invariably it is due to poor money management skills.

People tend to overspend without realizing, and this can prove to be disastrous. Using a daily expense managercan help you keep track of how much you spend eve ry day and on what. At the endof the month, you will have a clear picturewhere your moneyis goin g. This is one of the best ways to get your expenses under control and bring some semblance of order to your finances.Today, there are several expense manager applications in the market. Some are paid managers while others are free. Even banks like ICICI offer their customers expense tracker to helpthem out. Beforeyou decide to go in for a money manager,it is imp ortant to decidethe type you want.

2. LITERATURE SURVEY

a. Existing problem

In a study conducted by Forresterin 2016 surveyingsmall and medium busin esses (SMBs) across the world, 56% companies reported expense management as being the biggest challenge for their finance departments.

In another survey conducted by Levvel Research in 2018 in North America, respondents reported the following pain points in expense management before adopting automation:

i. Manual entry and routing of expense reports (62%)

ii. Lack of visibility into spend data (42%)

iii. Inability to enforce travel policies (29%)

iv. Lost expense reports (24%)

v. Lengthy expense approval system and reimbursement cycles(23%)

b. References

S.No	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
1.	**EXPENSE MANAGER APPLICATION. (2020)**	To Develop A Moblie Application That Keeps Record Of User Personal Expenses Contribution In Group Expenditure Top Investment Options View Of The Current Stock Market ,Read Authenticated Financial News	Android Studio	Cloud Application	Advantages: ➢ Keeps Track All Of Your Daily Transactions, Keeps Track Of Your Money Lent Or Borrowed. Disadvantages: ➢ Occupy Lot Of Space.
2.	**A NOVEL EXPENSE TRACKER USING STATISTICAL ANALYSIS. (2021)**	To Maintain And Manage Data Of Daily Expenditure In A More Precise Way.	SQL Lite	Cloud Application	Advantages: ➢ Its Suggest You With The Most Effective Investment Options. Disadvantages: ➢ The Work Done Being Is Not Accurate.

S.No	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
3.	**EXPENSE TRACKER. (2021)**	Facilitates The User To Keep Track And Manage Their Personal As Well As Business Expenses.	Android OS	Cloud Application	Advantages: ➢ Become Aware Of Poor Spending Habits And Take Care Of Your Finances Saving And Investment. Disadvantages: ➢ Searching And Referencing Is Difficult And Time-consuming.
4.	**EXPENSE TRACKER. (May 2021)**	The Application Keeps The Track Of The Income And Expenses Both Of User On A Day To Day Bases	Java	Cloud Application	Advantages: ➢ The Project Effectively Keeps Away From The Manual Figuring. Disadvantages: ➢ Report Generation Is A Tedious Process.

3. Problem Statement Definition

I am	Describe customer with 3-4 key characteristics - who are they?	Describe the customer and their attributes here
I'm trying to	List their outcome or "job" the care about - what are they trying to achieve?	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way – what bothers them most?	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists – what needs to be solved?	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view – how does it impact them emotionally?	Describe the emotions the result from experiencing the problems or barriers

Personal Expense Tracker Application:

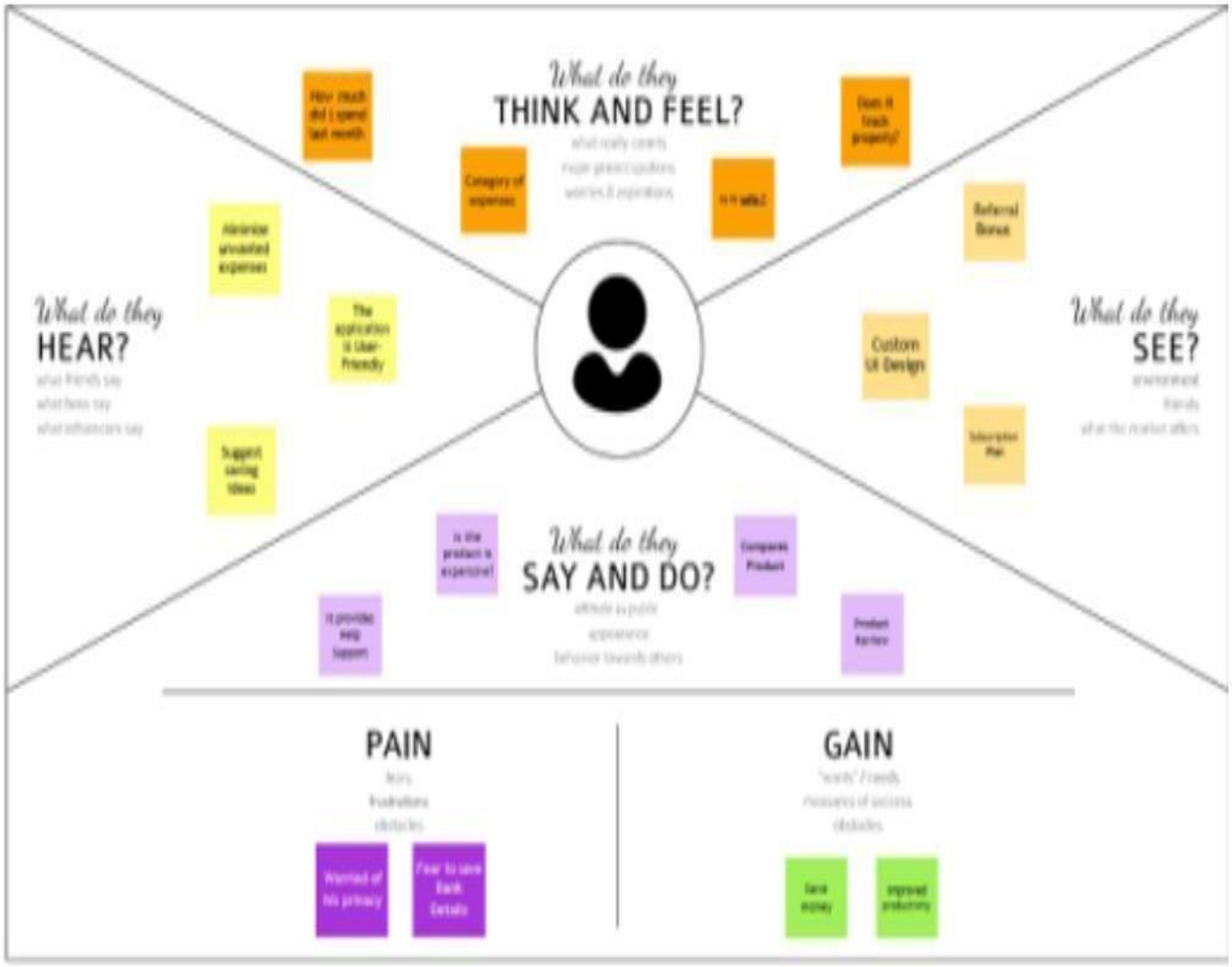
Customer Problem Statement :

A well-articulated customer problem statement allows us to find the ideal solution for the challenges our customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Student	Manage my expenses	It is very difficult	There is no proper app to warn me regarding my expense	Frustrated
PS-2	IT employee	Reduce my expense	I am not able to keep track of my expens e	I cant see the app whoch satisfies my needs	Annoyed

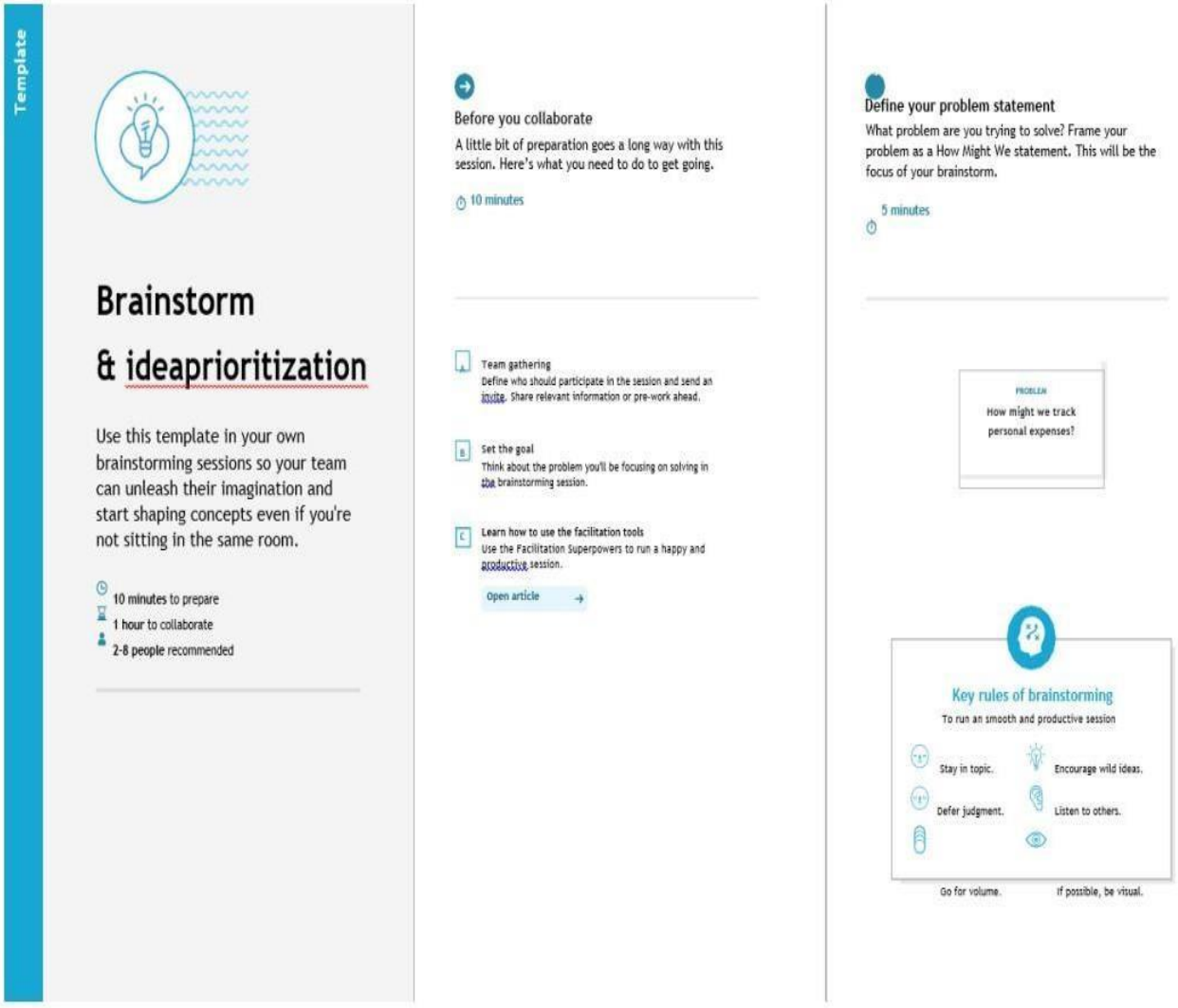
1. IDEATION & PROPOSED SOLUTION

a. Empathy Map Canvas



B. Ideation & Brainstorming

Step-1: Team Gathering, Collaboration and Select the Problem Statement



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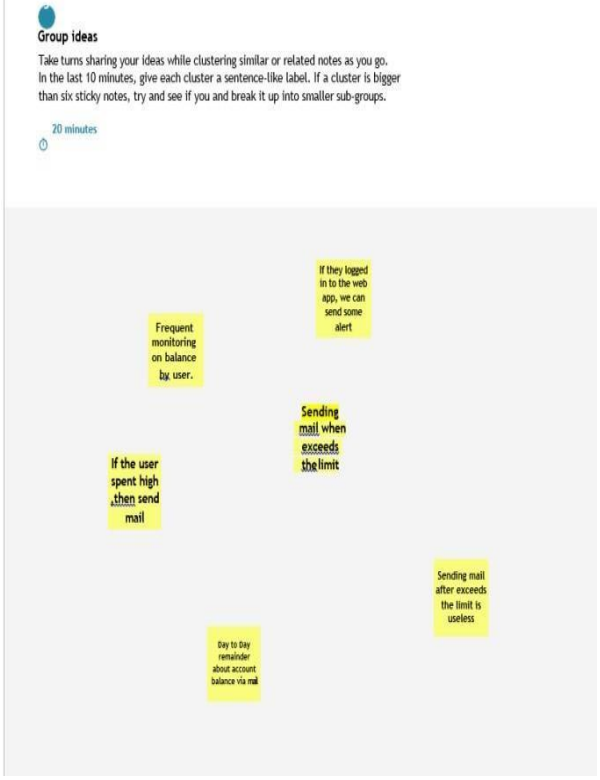
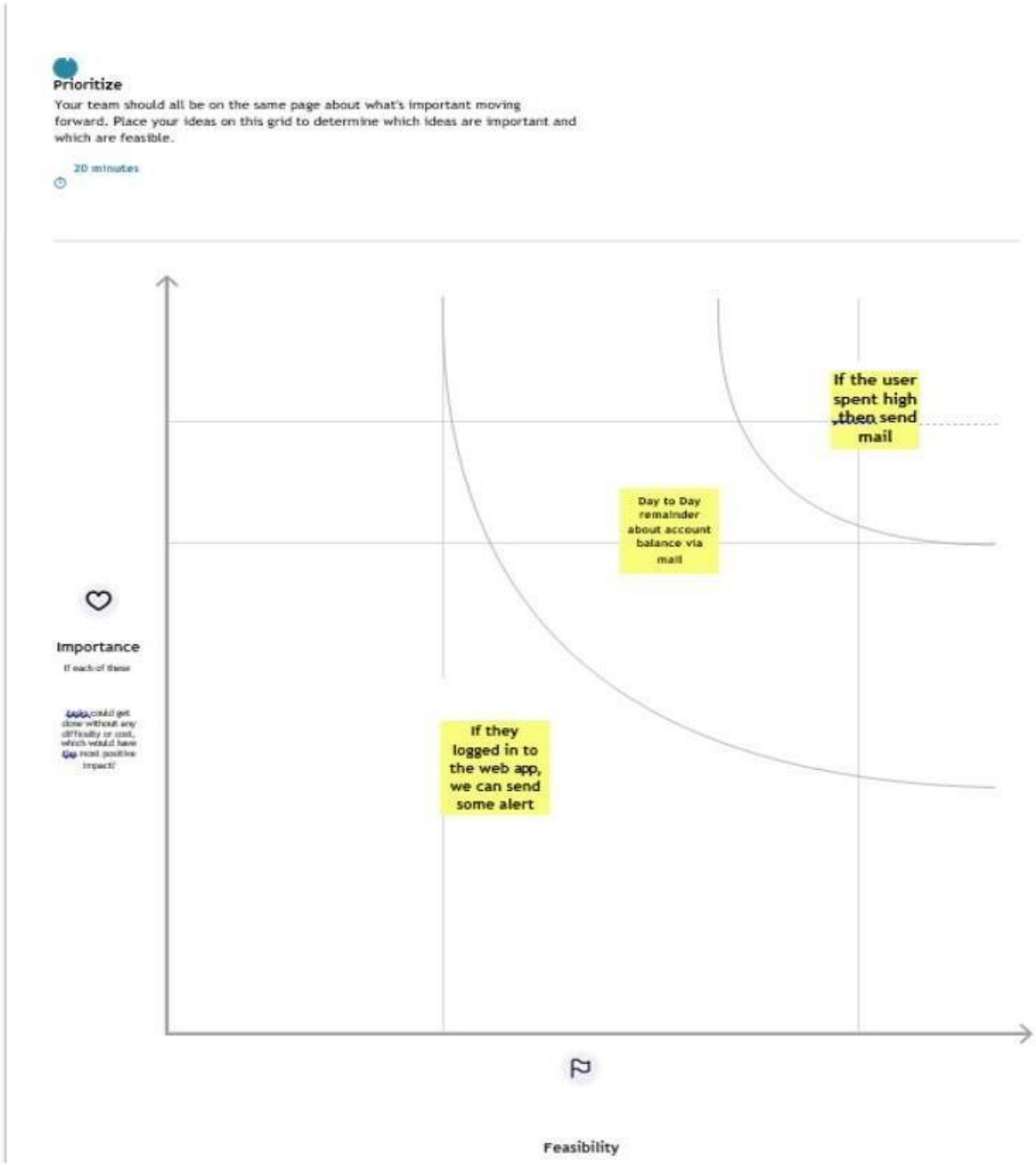
Step-2: Brainstorm, Idea Listing and Grouping



Step-3: Idea Prioritization



c.Proposed Solution

S.No.	Parameter	Description

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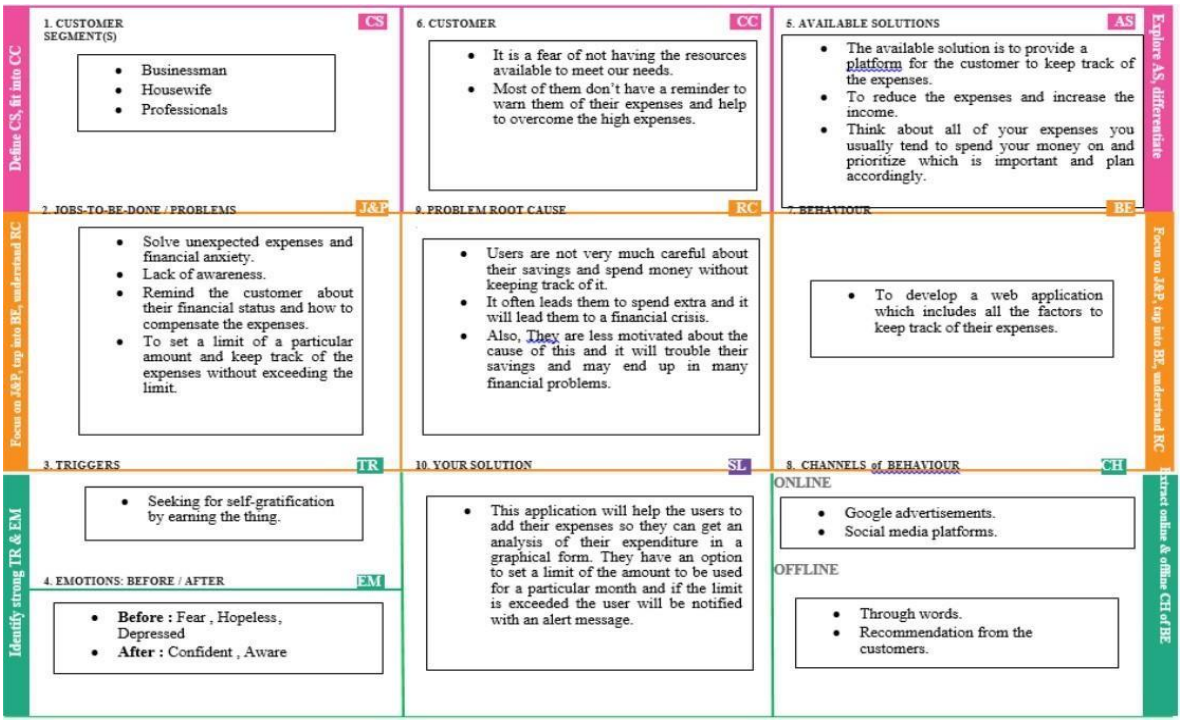
1.	Problem Statement (Problem to be solved)	Keeping Proper track of our daily expenses is becoming challenging in today's world. Without the proper money management knowledge people overspend on their wants instead of focusing on their needs. Especially when using online applications for purchasing their requirements consumers tend to over spend. This problem leads to improper distribution of their daily expenses. Without proper knowledge on managing money poor are becoming poorer and rich are becoming richer.
2.	Idea / Solution description	An attempt to develop an app to manage our daily expenses and give us insights on managing our money would be a good idea. This app will be able to track expenses on various online platforms and apps. The app can help with proper budgeting and give alerts when the user over spends or crosses the limit previously set by them. This will lead to proper spending habits and make them knowledgeable about money management. IBM cloud can be used to handle the data safely.
3.	Novelty / Uniqueness	The speciality for the app will be the data security with IBM cloud being used for data storage and this app genuinely helps with the money management. The proper and personalized budgeting of the user's money leads them to trust the app and they wouldn't have to worry about their expenditure on unnecessary things.
4.	Social Impact / Customer Satisfaction	People using the app will be becoming better at their spending habits and will be able to save more than their peers who are not using the app. This application aims to improve the users' savings sustainably and steadily which leads them to trust the app without worrying about their money.

5.	Business Model (Revenue Model)	This application leads to a business model, the user can be suggested the right products to buy based on their budget and this can lead to targeted business approaching the right consumers. The model leads to systematic and structured expenses of the user and also leads to predictive analysis of the future expenses of the consumer. This model makes the user more careful with expenses as they are provided with the money management insights.
6.	Scalability of the Solution	This application can be created as a multi user model nationwide. The model can also be modified based on the country's law on applications and data security which leads to international implementation of this application by maintaining proper gateway rules. This app when developed for multiple nations can be modified to their requirements. The app can also be modified for a particular group of people or organization.

d.Problem Solution fit



4. REQUIREMENT ANALYSIS

a. Functional requirements

FR No.	Functional Requirement	Description
FR-1	**Register**	Registration is the process of the user to complete the application's form. Certain details must be submitted such as e-mail address, password, and password confirmation. The user is identified using these details.
FR-2	**Login**	The login screen is used to verify the identity of the user. The account can be accessed using the user's registered email address and password.
FR-3	**Categories**	On the main page, we can see overall revenue and spending, as well as the balance remaining after expenditure, as well as the user's entire categories namely Entertainment, Cloth, Food and Drinks, Health and Fitness and so on.
FR-4	**Update Daily Expensive**	The user can upload the daily expensive details what they are spending on each day. The details such as cloth, entertainment, food, health etc.,

FR-5	**View Expensive Chart**	This module used to see a pictorial depiction of all details in the form of a pie chart, where each slice of the pie chart represents that the viewer to gain an approximatenotion of which category has the highest expenses.
NFR-6	**Set Alert**	When a user attempts to spend more than the pre-defined amount limit, the app will automatically send an alert if the threshold amount they selected for an alert is exceeded.

b. Non-Functional requirements

NFR No.	**Non-Functional Requirement**	**Description**
NFR-1	**Usability**	The system shall allow the users to access the system with pc using web application. The system uses a web application as an interface. The system is user friendly which makes the system easy.
NFR-2	**Security**	A security requirement is a statement of needed security functionality that ensures one of many different security properties of software is being satisfied.

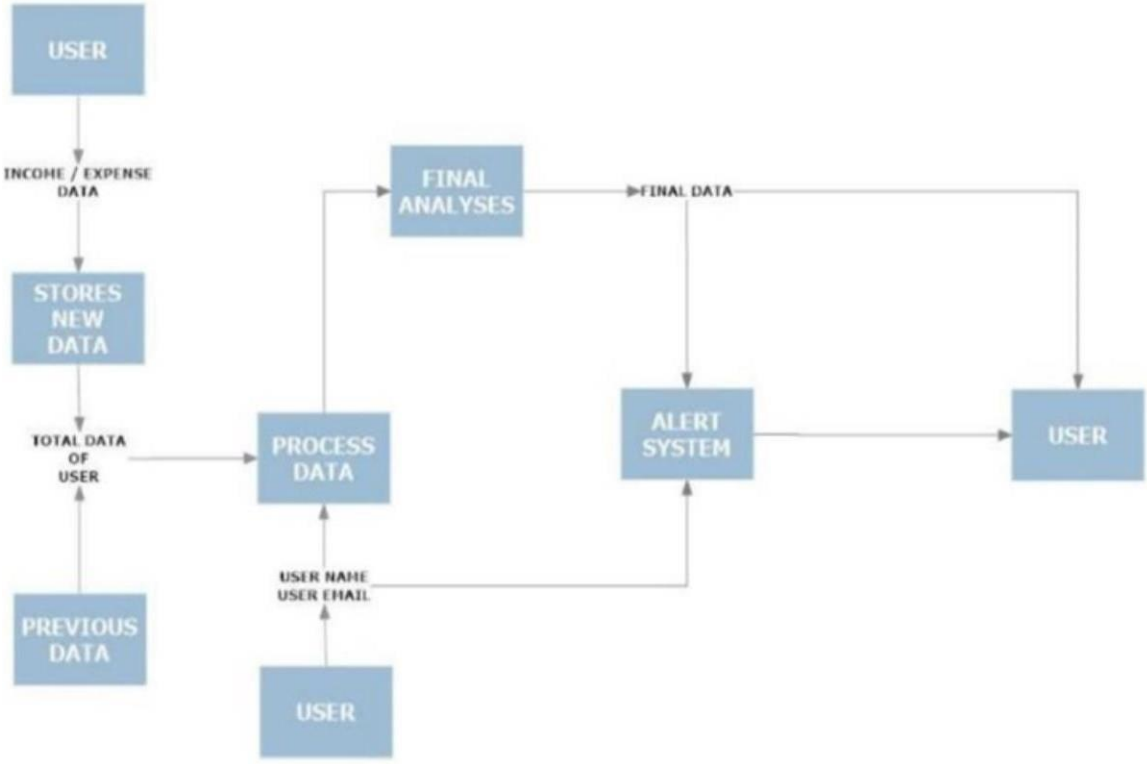
NFR-3	**Reliability**	he system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week. 24 hours a day.
NFR-4	**Performance**	The information is refreshed depending upon whether some updates have occurred or not in the application. The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs. Responses to view information shall take no longer than 5 seconds to appear on the screen.
NFR-5	**Availability**	The system is available 100% for the user and isused 24 hrs a day and 365 days a year. The system shallbe operational 24 hours a day and 7 days a week.
NFR-6	**Scalability**	Scalability is the measure of a system's ability toincrease or decrease in performance and cost in response to changes in application and system processing demands.

5. **PROJECT DESIGN**

a. Data Flow Diagrams

PNT2022TMID15737

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



B.Solution & Technical Architecture

C.**User Stories**

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority

Customer (web user)	Registration	USN-1	As a user, I can register for the application by entering mail id and password	I can access my account/ dashboard	High
		USN-2	As a user,I will receive a confirmation email once I have registered for the email and click application	I can receive a confirmation email	High
		USN-3	As a user, I can access using mail	I can register through mail	Low
	Login	USN-4	As a user, I can login application by entering application using email and password	I can access the application	High
	Dashboard	USN-5	As a user,I can view my income and expenditure details	I can view my daily expenses	High
Customer care executive		USN-6	As a customer care executive, I can solve the login issue and other issues of the solution at any application	I can provide support	Medium
Administrator	Application	USN-7	As an administrator,I can upgrade or update the application	I can fix the bug	Medium

6. PROJECT PLANNING & SCHEDULING

a. Sprint planning and estimation

Sprint -4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

b. Sprint Delivery Schedule

S.NO	MILESTONES	ACTIVITIES	DATE
1.	**Preparation Phase**	Pre-requisites	24 Aug 2022
		Prior Knowledge	25 Aug 2022
		Project Structure	23 Aug 2022
		Project Flow	23 Aug 2022
		Project Objectives	22 Aug 2022
		Registrations	26 Aug 2022
		Environment Set-up	27 Aug 2022
2.	**Ideation Phase**	Literature Survey	29 Aug 2022 – 03 Sept 2022
		Empathy Map	5 Sept 2022 - 7 Sept 2022
		Problem Statement	8 Sept 2022 - 10 Sept 2022
		Ideation	12 Sept 2022 – 16 Sept 2022
3.	**Project Design Phase - 1**	Proposed Solution	19 Sept 2022 – 23 Sept 2022
		Problem Solution Fit	24 Sept 2022 – 26 Sept 2022

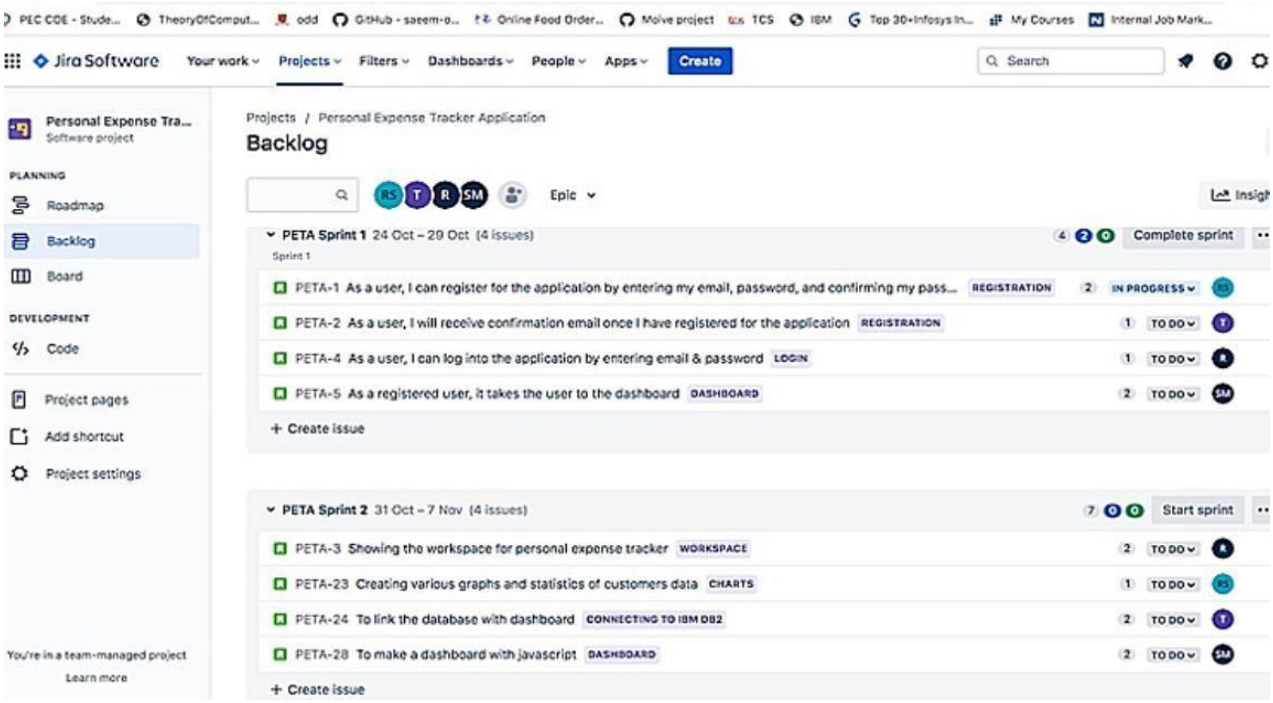
		Solution Architecture	27 Sept 2022 – 30 Sept 2022

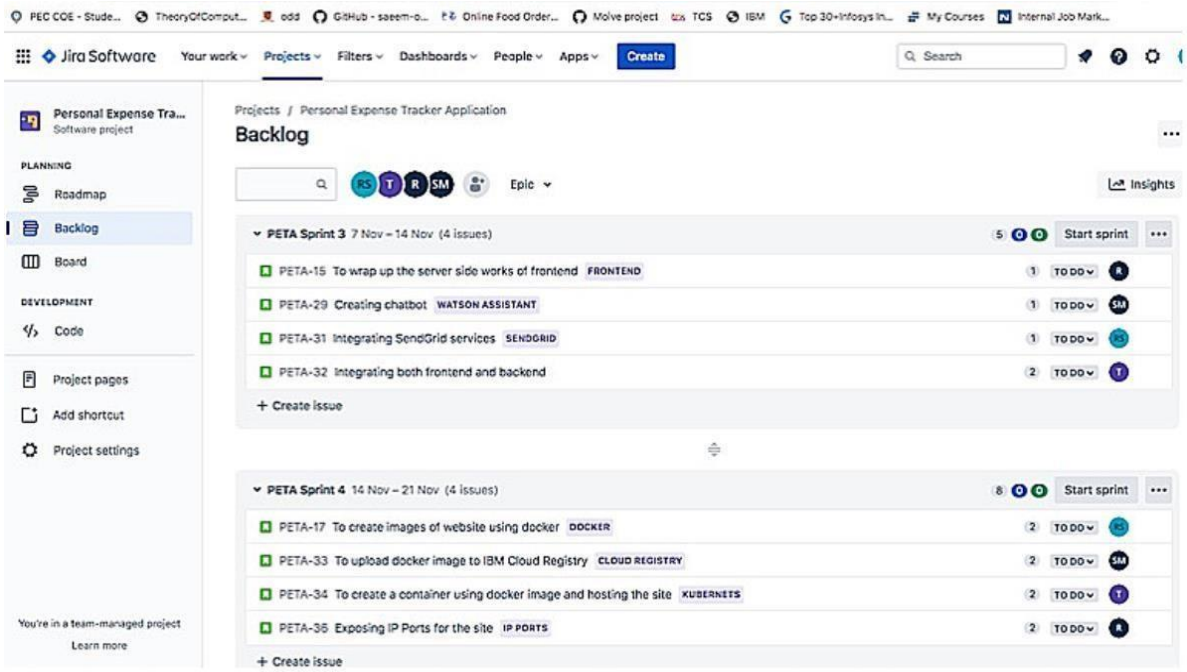
4.	**Project Design Phase - 2**	Customer Journey Map	03 Oct 2022 – 08 Oct 2022
		Requirement Analysis	09 Oct 2022 – 11 Oct 2022
		Data Flow Diagrams	11 Oct 2022 – 14 Oct 2022
		Technology Architecture	15 Oct 2022 - 16 Oct 2022
5.	**Project Planning Phase**	Milestones & Tasks	17 Oct 2022 – 18 Oct 2022
		Sprint Schedules	19 Oct 2022 – 22 Oct 2022
6.	**Project Development Phase**	Sprint - 1	24 Oct 2022 – 29 Oct 2022
		Sprint – 2	31 Oct 2022 – 05 Nov 2022
		Sprint – 3	07 Nov 2022 – 12 Nov 2022

		Sprint – 4	14 Nov 2022 – 19 Nov 2022

a. **Reports from JIRA**

i. Backlog


Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
Personal Expense Tra...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Projects / Personal Expense Tracker Application
Backlog
Epic
PETA Sprint 1 24 Oct – 29 Oct (4 issues)
Complete sprint
PETA-1 As a user, I can register for the application by entering my email, password, and confirming my pass... REGISTRATION IN PROGRESS
PETA-2 As a user, I will receive confirmation email once I have registered for the application REGISTRATION TO DO
PETA-4 As a user, I can log into the application by entering email & password LOGIN TO DO
PETA-5 As a registered user, it takes the user to the dashboard DASHBOARD TO DO
+ Create issue
PETA Sprint 2 31 Oct – 7 Nov (4 issues)
Start sprint
PETA-3 Showing the workspace for personal expense tracker WORKSPACE TO DO
PETA-23 Creating various graphs and statistics of customers data CHARTS TO DO
PETA-24 To link the database with dashboard CONNECTING TO IBM DB2 TO DO
PETA-28 To make a dashboard with javascript DASHBOARD TO DO
+ Create issue


Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
Personal Expense Tra...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Projects / Personal Expense Tracker Application
Backlog
Epic
Insights
PETA Sprint 3 7 Nov – 14 Nov (4 issues)
Start sprint
PETA-15 To wrap up the server side works of frontend FRONTEND TO DO
PETA-29 Creating chatbot WATSON ASSISTANT TO DO
PETA-31 Integrating SendGrid services SENDGRID TO DO
PETA-32 Integrating both frontend and backend TO DO
+ Create issue
PETA Sprint 4 14 Nov – 21 Nov (4 issues)
Start sprint
PETA-17 To create images of website using docker DOCKER TO DO
PETA-33 To upload docker image to IBM Cloud Registry CLOUD REGISTRY TO DO
PETA-34 To create a container using docker image and hosting the site KUBERNETS TO DO
PETA-35 Exposing IP Ports for the site IP PORTS TO DO
+ Create issue

ii. Board

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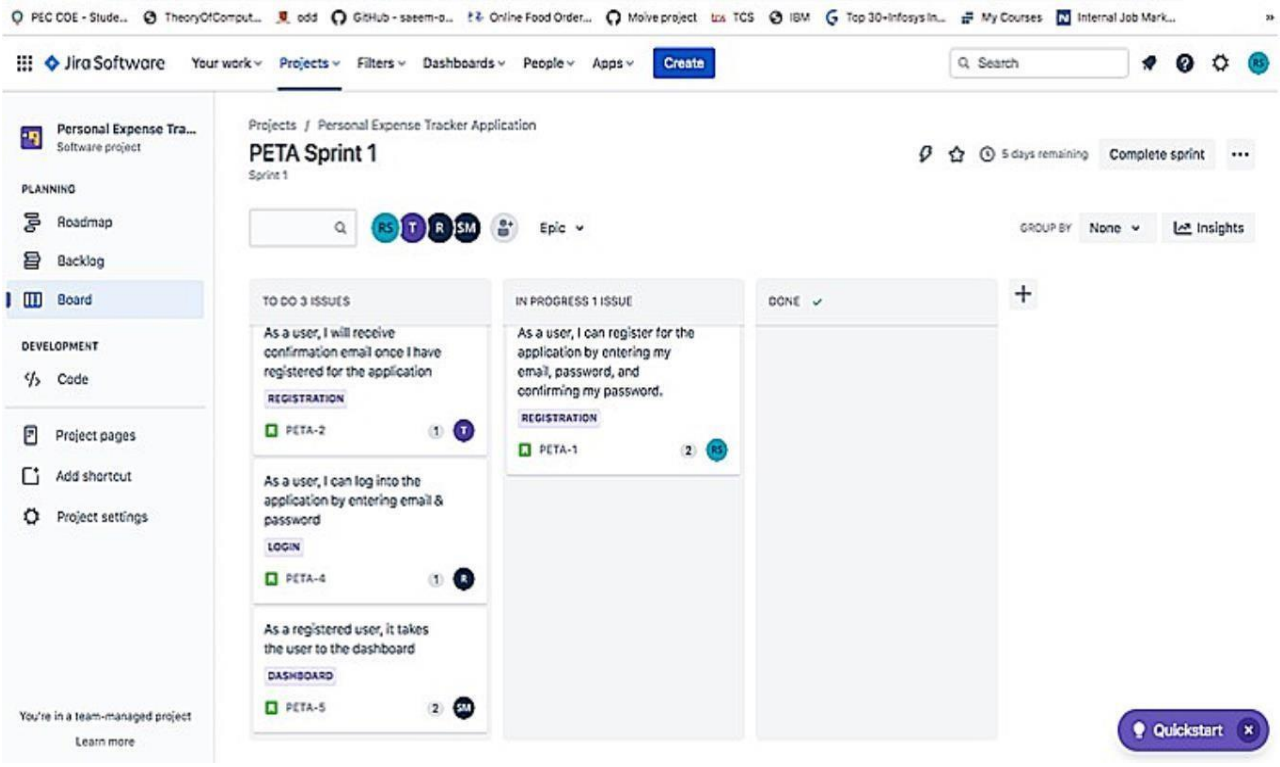
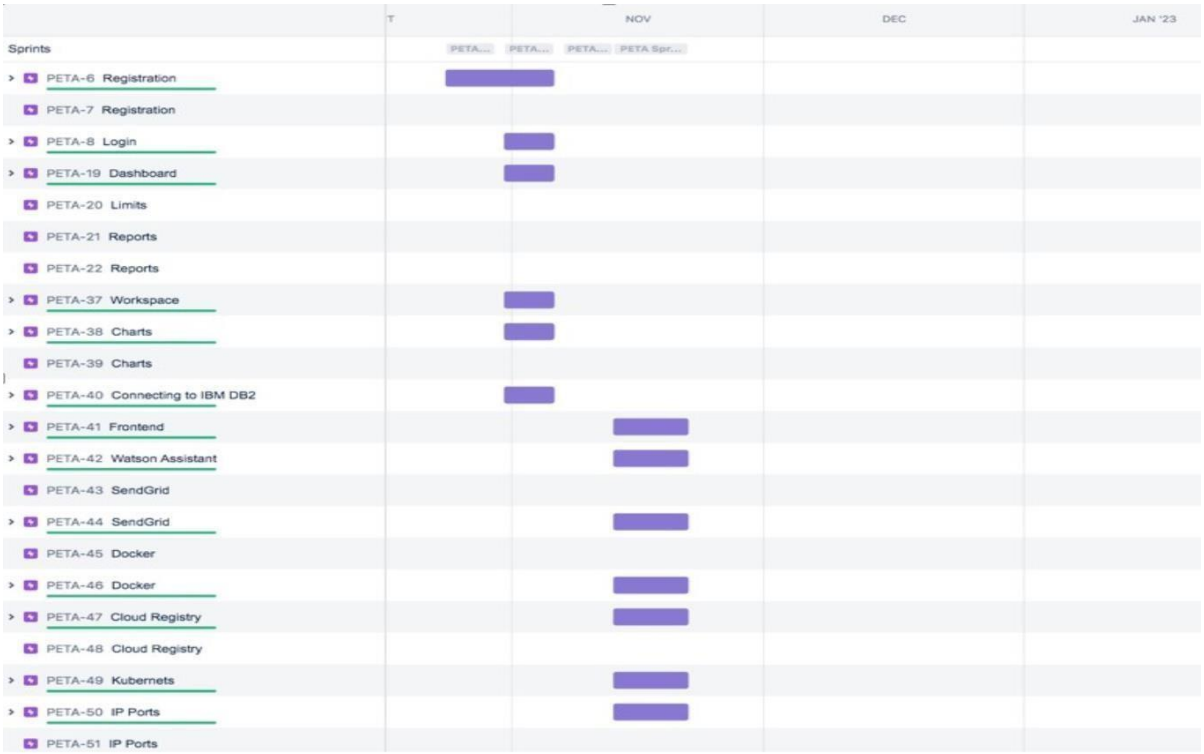


iii. Road Map



7. CODING & SOLUTIONING

app.py:

```
# -*- coding: utf-8 -*-
"""
Spyder Editor

This is a temporary script file.
"""

from flask import Flask, render_template, request, redirect, session
# from flask_mysqldb import MySQL
# import MySQLdb.cursors import re

from flask_db2 import DB2
import ibm_db import
ibm_db_dbi
from sendemail import sendgridmail,sendmail

# from gevent.pywsgi import WSGIServer import
os

app = Flask(__name__)
app.secret_key = 'a'

# app.config['MYSQL_HOST'] = 'remotemysql.com'
# app.config['MYSQL_USER'] = 'D2DxDUPBii'
# app.config['MYSQL_PASSWORD'] = 'r8XBO4GsMz'
# app.config['MYSQL_DB'] = 'D2DxDUPBii'
"""
dsn_hostname = "3883e7e4-18f5-4afe-be8c-
fa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud"
dsn_uid = "sbb93800" dsn_pwd = "wobsVLm6ccFxcNLe"
dsn_driver = "{IBM DB2 ODBC DRIVER}" dsn_database = "bludb"
dsn_port = "31498" dsn_protocol = "tcpip"

dsn = (
```

```
    "DRIVER={0};"
    "DATABASE={1};"
    "HOSTNAME={2};"
    "PORT={3};"
    "PROTOCOL={4};"
    "UID={5};"
    "PWD={6};"
).format(dsn_driver, dsn_database, dsn_hostname, dsn_port, dsn_protocol, dsn_uid,
dsn_pwd)
"""
# app.config['DB2_DRIVER'] = '{IBM DB2 ODBC DRIVER}'
app.config['database']  =  'bludb'  app.config['hostname']  =
'3883e7e4-18f5-4afe-be8c-
fa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud'
app.config['port'] = '31498' app.config['protocol'] = 'tcpip'
app.config['uid'] = 'sbb93800' app.config['pwd'] =
'wobsVLm6ccFxcNLe' app.config['security'] = 'SSL' try:
    mysql = DB2(app)
    conn_str='database=bludb;hostname=3883e7e4-18f5-4afe-be8c-
fa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;port=31498;protocol=tcp
i p;\
          uid=sbb93800;pwd=wobsVLm6ccFxcNLe;security=SSL'
    ibm_db_conn = ibm_db.connect(conn_str,'','')


    print("Database connected without any error !!")
except:
     print("IBM DB Connection error :      " + DB2.conn_errormsg())


# app.config['']


# mysql = MySQL(app)



#HOME--PAGE
```

```
@app.route("/home") def
home():
    return render_template("homepage.html")

@app.route("/") def
add():
    return render_template("home.html")



#SIGN--UP--OR--REGISTER



@app.route("/signup") def
signup():
    return render_template("signup.html")



@app.route('/register', methods =['GET', 'POST'])
def register(): msg = '' print("Break point1")
    if request.method == 'POST' : username
    =    request.form['username']    email    =
    request.form['email']       password       =
    request.form['password']

        print("Break point2" + "name: " + username + "------" + email + "------ " + password)
        try:
            print("Break point3") connectionID =
            ibm_db_dbi.connect(conn_str, '', '') cursor =
            connectionID.cursor() print("Break point4")
        except:
            print("No connection Established")
```

```
# cursor = mysql.connection.cursor() #
with app.app_context():
#     print("Break point3")
#     cursor = ibm_db_conn.cursor()
#     print("Break point4")

print("Break point5")
sql = "SELECT * FROM register WHERE username = ?"
stmt = ibm_db.prepare(ibm_db_conn, sql)
ibm_db.bind_param(stmt, 1, username)
ibm_db.execute(stmt) result = ibm_db.execute(stmt)
print(result)
account = ibm_db.fetch_row(stmt) print(account)


param = "SELECT * FROM register WHERE username = '' + "\'" + username + "\'"
res = ibm_db.exec_immediate(ibm_db_conn, param) print(" ---- ")
dictionary = ibm_db.fetch_assoc(res) while
dictionary != False:
    print("The ID is : ", dictionary["USERNAME"]) dictionary
    = ibm_db.fetch_assoc(res)

# dictionary = ibm_db.fetch_assoc(result)
# cursor.execute(stmt)

# account = cursor.fetchone()
# print(account)

# while ibm_db.fetch_row(result) != False:
#     # account = ibm_db.result(stmt)
#     print(ibm_db.result(result, "username"))
```

```
        # print(dictionary["username"])
        print("break point 6") if
        account:
            msg = 'Username already exists !'
        elif not re.match(r'[^@]+@[^@]+\.[^@]+', email):
            msg = 'Invalid email address !'
        elif not re.match(r'[A-Za-z0-9]+', username):
            msg = 'name must contain only characters and numbers !'
        else:
            sql2 = "INSERT INTO register (username, email,password) VALUES (?, ?,
            ?)" stmt2 = ibm_db.prepare(ibm_db_conn, sql2) ibm_db.bind_param(stmt2,
            1, username) ibm_db.bind_param(stmt2, 2, email) ibm_db.bind_param(stmt2,
            3, password)
            ibm_db.execute(stmt2)
            # cursor.execute('INSERT INTO register VALUES (NULL, % s, % s, % s)',
    (username, email,password)) # mysql.connection.commit() msg = 'You have
    successfully registered !' return render_template('signup.html', msg = msg)



    #LOGIN--PAGE

    @app.route("/signin") def
    signin():
        return render_template("login.html")

    @app.route('/login',methods =['GET', 'POST'])
    def login(): global userid msg = ''

if request.method == 'POST' :
        username = request.form['username'] password
        = request.form['password']
        # cursor = mysql.connection.cursor()
```

```
        # cursor.execute('SELECT * FROM register WHERE username = % s AND password
= % s', (username, password ),)
        # account = cursor.fetchone()
        # print (account)


        sql = "SELECT * FROM register WHERE username = ? and password = ?"
        stmt  =  ibm_db.prepare(ibm_db_conn,  sql)  ibm_db.bind_param(stmt,  1,
        username)
        ibm_db.bind_param(stmt, 2, password)
        result = ibm_db.execute(stmt)
        print(result) account =
        ibm_db.fetch_row(stmt) print(account)


        param = "SELECT * FROM register WHERE username = '' + "\'" + username + "\'" + "
and password = " + "\'" + password + "\'" res =
        ibm_db.exec_immediate(ibm_db_conn, param)
        dictionary = ibm_db.fetch_assoc(res)


        # sendmail("hello sakthi","sivasakthisairam@gmail.com")
if account:
            session['loggedin'] = True session['id'] =
            dictionary["ID"] userid = dictionary["ID"]
            session['username'] =
            dictionary["USERNAME"] session['email'] =
            dictionary["EMAIL"]


            return redirect('/home')
        else:
            msg = 'Incorrect username / password !'
    return render_template('login.html', msg = msg)


#ADDING --- DATA
```

```
@app.route("/add") def
adding():
    return render_template('add.html')



@app.route('/addexpense',methods=['GET', 'POST']) def
addexpense():

    date = request.form['date'] expensename =
    request.form['expensename'] amount =
    request.form['amount'] paymode =
    request.form['paymode'] category =
    request.form['category']

    print(date) p1 =
    date[0:10] p2 =
    date[11:13] p3
    = date[14:]
    p4 = p1 + "-" + p2 + "." + p3 + ".00"
    print(p4)
    # cursor = mysql.connection.cursor()
    # cursor.execute('INSERT INTO expenses VALUES (NULL, % s, % s, % s, % s, % s, %
s)', (session['id'] ,date, expensename, amount, paymode, category))
    # mysql.connection.commit()
    # print(date + " " + expensename + " " + amount + " " + paymode + " " + category)
sql = "INSERT INTO expenses (userid, date, expensename, amount, paymode, category)
VALUES (?, ?, ?, ?, ?, ?)" stmt =
    ibm_db.prepare(ibm_db_conn, sql)
    ibm_db.bind_param(stmt, 1, session['id'])
    ibm_db.bind_param(stmt, 2, p4)
    ibm_db.bind_param(stmt, 3,
    expensename) ibm_db.bind_param(stmt,
    4, amount) ibm_db.bind_param(stmt, 5,
    paymode) ibm_db.bind_param(stmt, 6,
    category) ibm_db.execute(stmt)
```

```
    print("Expenses added")


    # email part

    param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " AND
MONTH(date) = MONTH(current timestamp) AND YEAR(date) = YEAR(current timestamp)
ORDER BY date DESC" res =
    ibm_db.exec_immediate(ibm_db_conn, param)
    dictionary = ibm_db.fetch_assoc(res) expense = []
    while dictionary != False:
        temp = [] temp.append(dictionary["ID"])
        temp.append(dictionary["USERID"])
        temp.append(dictionary["DATE"])
        temp.append(dictionary["EXPENSENAME"]
        ) temp.append(dictionary["AMOUNT"])
        temp.append(dictionary["PAYMODE"])
        temp.append(dictionary["CATEGORY"])
        expense.append(temp) print(temp)
        dictionary = ibm_db.fetch_assoc(res)
 total=0 for x in expense: total
+= x[4]
    param = "SELECT id, limitss FROM limits WHERE userid = " + str(session['id']) + "
ORDER BY id DESC LIMIT 1" res =
    ibm_db.exec_immediate(ibm_db_conn, param)
    dictionary = ibm_db.fetch_assoc(res) row = [] s = 0
    while dictionary != False:
        temp = []
        temp.append(dictionary["LIMITSS"])
        row.append(temp) dictionary =
        ibm_db.fetch_assoc(res) s = temp[0]


    if total > int(s):
        msg = "Hello " + session['username'] + " , " + "you have crossed the monthly limit of
Rs. " + s + "/- !!!" + "\n" + "Thank you, " + "\n" + "Team Personal Expense Tracker."
        sendmail(msg,session['email'])
 return redirect("/display")
```

```
#DISPLAY---graph


@app.route("/display") def
display():
    print(session["username"],session['id'])


    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND date ORDER
BY `expenses`.`date` DESC',(str(session['id'])))
    # expense = cursor.fetchall()
 param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " ORDER BY date
DESC"
    res = ibm_db.exec_immediate(ibm_db_conn,
    param) dictionary = ibm_db.fetch_assoc(res)
    expense = [] while dictionary != False:
      temp = [] temp.append(dictionary["ID"])
      temp.append(dictionary["USERID"])
      temp.append(dictionary["DATE"])
      temp.append(dictionary["EXPENSENAME"]
      ) temp.append(dictionary["AMOUNT"])
      temp.append(dictionary["PAYMODE"])
      temp.append(dictionary["CATEGORY"])
      expense.append(temp) print(temp)
      dictionary = ibm_db.fetch_assoc(res)
 return render_template('display.html' ,expense = expense)




#delete---the--data
```

```
@app.route('/delete/<string:id>', methods = ['POST', 'GET' ]) def
delete(id):
    # cursor = mysql.connection.cursor()
    # cursor.execute('DELETE FROM expenses WHERE id = {0}'.format(id)) #
    mysql.connection.commit()

    param = "DELETE FROM expenses WHERE id = " + id res
    = ibm_db.exec_immediate(ibm_db_conn, param)

    print('deleted successfully')
    return redirect("/display")



#UPDATE---DATA

@app.route('/edit/<id>', methods = ['POST', 'GET' ]) def
edit(id):
    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT * FROM expenses WHERE id = %s', (id,)) #
    row = cursor.fetchall()

    param = "SELECT * FROM expenses WHERE id = " + id
    res = ibm_db.exec_immediate(ibm_db_conn, param)
    dictionary = ibm_db.fetch_assoc(res) row = [] while
    dictionary != False:
        temp = [] temp.append(dictionary["ID"])
        temp.append(dictionary["USERID"])
        temp.append(dictionary["DATE"])
        temp.append(dictionary["EXPENSENAME"]
        ) temp.append(dictionary["AMOUNT"])
        temp.append(dictionary["PAYMODE"])
        temp.append(dictionary["CATEGORY"])
        row.append(temp) print(temp)
        dictionary = ibm_db.fetch_assoc(res)
```

```
  print(row[0]) return render_template('edit.html', expenses =
row[0]) @app.route('/update/<id>', methods = ['POST']) def
update(id):
                if request.method == 'POST' :

                    date  =  request.form['date']  expensename  =
                    request.form['expensename']     amount     =
                    request.form['amount']         paymode        =
                    request.form['paymode']        category       =
                    request.form['category']


                   # cursor = mysql.connection.cursor()
                   # cursor.execute("UPDATE `expenses` SET `date` = % s , `expensename` = % s ,
               `amount` = % s, `paymode` = % s, `category` = % s WHERE `expenses`.`id` = % s ",(date,
               expensename, amount, str(paymode), str(category),id))
                   # mysql.connection.commit()
  p1 = date[0:10] p2 =
date[11:13] p3 = date[14:]
                    p4 = p1 + "-" + p2 + "." + p3 + ".00"
  sql = "UPDATE expenses SET date = ? , expensename = ? , amount = ?, paymode = ?,
               category = ? WHERE id = ?" stmt =
                    ibm_db.prepare(ibm_db_conn, sql)
                    ibm_db.bind_param(stmt, 1, p4)
                    ibm_db.bind_param(stmt, 2, expensename)
                    ibm_db.bind_param(stmt, 3, amount)
                    ibm_db.bind_param(stmt, 4, paymode)
                    ibm_db.bind_param(stmt, 5, category)
                    ibm_db.bind_param(stmt, 6, id)
                    ibm_db.execute(stmt)


                    print('successfully updated') return
                    redirect("/display") #limit

               @app.route("/limit" ) def
               limit():
                     return redirect('/limitn')
```

```
@app.route("/limitnum" , methods = ['POST' ]) def
limitnum():
    if request.method == "POST":
        number= request.form['number']
        # cursor = mysql.connection.cursor()
        # cursor.execute('INSERT INTO limits VALUES (NULL, % s, % s) ',(session['id'],
number))
        # mysql.connection.commit()
sql = "INSERT INTO limits (userid, limitss) VALUES (?, ?)" stmt =
ibm_db.prepare(ibm_db_conn, sql) ibm_db.bind_param(stmt, 1,
session['id']) ibm_db.bind_param(stmt, 2, number) ibm_db.execute(stmt)

        return redirect('/limitn')


@app.route("/limitn") def
limitn():
    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT limitss FROM `limits` ORDER BY `limits`.`id` DESC LIMIT 1')
    # x= cursor.fetchone()
    # s = x[0]
param = "SELECT id, limitss FROM limits WHERE userid = " + str(session['id']) + "
    ORDER BY id DESC LIMIT 1" res =
    ibm_db.exec_immediate(ibm_db_conn, param)
    dictionary = ibm_db.fetch_assoc(res) row = [] s = " /-
    " while dictionary != False:
        temp = []
        temp.append(dictionary["LIMITSS"])
        row.append(temp) dictionary =
        ibm_db.fetch_assoc(res) s = temp[0]

    return render_template("limit.html" , y= s)

#REPORT
```

```
@app.route("/today") def
today():
    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT TIME(date) , amount FROM expenses WHERE userid = %s
AND DATE(date) = DATE(NOW()) ',(str(session['id'])))
    # texpense = cursor.fetchall()
    # print(texpense)
     param1 = "SELECT TIME(date) as tn, amount FROM expenses WHERE userid = " +
str(session['id']) + " AND DATE(date) = DATE(current timestamp) ORDER BY date DESC"
     res1 = ibm_db.exec_immediate(ibm_db_conn, param1) dictionary1 =
     ibm_db.fetch_assoc(res1) texpense = []

     while dictionary1 != False:
        temp = []
        temp.append(dictionary1["TN"])
        temp.append(dictionary1["AMOUNT"]
        ) texpense.append(temp) print(temp)
        dictionary1 = ibm_db.fetch_assoc(res1)

    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND DATE(date) =
DATE(NOW()) AND date ORDER BY `expenses`.`date` DESC',(str(session['id'])))
    # expense = cursor.fetchall()
     param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " AND
DATE(date) = DATE(current timestamp) ORDER BY date DESC" res =
ibm_db.exec_immediate(ibm_db_conn, param) dictionary = ibm_db.fetch_assoc(res)
expense = [] while dictionary != False:
        temp = [] temp.append(dictionary["ID"])
        temp.append(dictionary["USERID"])
        temp.append(dictionary["DATE"])
        temp.append(dictionary["EXPENSENAME"]
        ) temp.append(dictionary["AMOUNT"])
        temp.append(dictionary["PAYMODE"])
```

```
        temp.append(dictionary["CATEGORY"])
        expense.append(temp) print(temp)
        dictionary = ibm_db.fetch_assoc(res)


    total=0
    t_food=0
    t_entertainment=
    0 t_business=0
    t_rent=0 t_EMI=0
    t_other=0


    for x in expense:
        total += x[4] if
        x[6] == "food":
        t_food += x[4]

        elif x[6] == "entertainment": t_entertainment
            += x[4]

        elif x[6] == "business":
            t_business += x[4]
        elif x[6] == "rent":
        t_rent += x[4]

        elif x[6] == "EMI":
            t_EMI += x[4]

        elif x[6] == "other": t_other
            += x[4]

    print(total)
print(t_food) print(t_entertainment)
print(t_business) print(t_rent)
```

```
print(t_EMI)
print(t_other)


return render_template("today.html", texpense = texpense, expense = expense, total =
total ,
                t_food = t_food,t_entertainment = t_entertainment, t_business
                = t_business, t_rent = t_rent,
                t_EMI = t_EMI, t_other = t_other )


@app.route("/month") def
month():
    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT DATE(date), SUM(amount) FROM expenses WHERE userid=
%s AND MONTH(DATE(date))= MONTH(now()) GROUP BY DATE(date) ORDER
BY DATE(date) ',(str(session['id'])))
    # texpense = cursor.fetchall()
    # print(texpense)
     param1 = "SELECT DATE(date) as dt, SUM(amount) as tot FROM expenses WHERE
userid = " + str(session['id']) + " AND MONTH(date) = MONTH(current timestamp) AND
YEAR(date) = YEAR(current timestamp) GROUP BY DATE(date) ORDER BY DATE(date)"
    res1 = ibm_db.exec_immediate(ibm_db_conn, param1) dictionary1 =
    ibm_db.fetch_assoc(res1) texpense = []
while dictionary1 != False:
        temp = []
        temp.append(dictionary1["DT"])
        temp.append(dictionary1["TOT"])
        texpense.append(temp) print(temp)
        dictionary1 =
        ibm_db.fetch_assoc(res1) # cursor =
        mysql.connection.cursor()
    # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND
MONTH(DATE(date))= MONTH(now()) AND date ORDER BY `expenses`.`date`
DESC',(str(session['id'])))
```

```
    # expense = cursor.fetchall()

     param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " AND
MONTH(date) = MONTH(current timestamp) AND YEAR(date) = YEAR(current timestamp)
ORDER BY date DESC" res =

     ibm_db.exec_immediate(ibm_db_conn, param)

     dictionary = ibm_db.fetch_assoc(res) expense = []

     while dictionary != False:

        temp = [] temp.append(dictionary["ID"])

        temp.append(dictionary["USERID"])

        temp.append(dictionary["DATE"])

        temp.append(dictionary["EXPENSENAME"]

        ) temp.append(dictionary["AMOUNT"])

        temp.append(dictionary["PAYMODE"])

        temp.append(dictionary["CATEGORY"])

        expense.append(temp) print(temp)

        dictionary = ibm_db.fetch_assoc(res)



     total=0 t_food=0

     t_entertainment=

     0 t_business=0

     t_rent=0 t_EMI=0

     t_other=0



     for  x  in  expense:

        total  +=  x[4]  if

        x[6]  ==  "food":

        t_food += x[4]

        elif x[6] == "entertainment": t_entertainment

            += x[4]

        elif x[6] == "business":
```

```
            t_business += x[4]
        elif x[6] == "rent":
        t_rent += x[4]

        elif x[6] == "EMI":
            t_EMI += x[4]

        elif x[6] == "other": t_other
            += x[4]

    print(total)
print(t_food) print(t_entertainment)
print(t_business) print(t_rent)
print(t_EMI) print(t_other)
```

```
    return render_template("today.html", texpense = texpense, expense = expense, total =
total ,
                    t_food = t_food,t_entertainment = t_entertainment,
                    t_business = t_business, t_rent = t_rent, t_EMI =
                    t_EMI, t_other = t_other )


@app.route("/year") def
year():
    # cursor = mysql.connection.cursor()
    # cursor.execute('SELECT MONTH(date), SUM(amount) FROM expenses WHERE
userid= %s AND YEAR(DATE(date))= YEAR(now()) GROUP BY MONTH(date) ORDER BY
MONTH(date) ',(str(session['id'])))
    #   texpense = cursor.fetchall()
    # print(texpense)

    param1 = "SELECT MONTH(date) as mn, SUM(amount) as tot FROM expenses
WHERE userid = " + str(session['id']) + " AND YEAR(date) = YEAR(current timestamp)
GROUP BY MONTH(date) ORDER BY MONTH(date)" res1 =
```

```
ibm_db.exec_immediate(ibm_db_conn, param1) dictionary1 =
ibm_db.fetch_assoc(res1) texpense = []
while dictionary1 != False:
    temp = []
    temp.append(dictionary1["MN"])
    temp.append(dictionary1["TOT"])
    texpense.append(temp) print(temp)
    dictionary1 = ibm_db.fetch_assoc(res1)



  # cursor = mysql.connection.cursor()
  # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND
YEAR(DATE(date))= YEAR(now()) AND date ORDER BY `expenses`.`date`
DESC',(str(session['id'])))
  # expense = cursor.fetchall()
    param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " AND
YEAR(date) = YEAR(current timestamp) ORDER BY date DESC" res =
ibm_db.exec_immediate(ibm_db_conn, param) dictionary = ibm_db.fetch_assoc(res)
expense = [] while dictionary != False:
    temp = [] temp.append(dictionary["ID"])
    temp.append(dictionary["USERID"])
    temp.append(dictionary["DATE"])
    temp.append(dictionary["EXPENSENAME"]
    ) temp.append(dictionary["AMOUNT"])
    temp.append(dictionary["PAYMODE"])
    temp.append(dictionary["CATEGORY"])
    expense.append(temp) print(temp)
    dictionary = ibm_db.fetch_assoc(res)



  total=0 t_food=0
  t_entertainment=
  0 t_business=0
  t_rent=0 t_EMI=0
  t_other=0
```

```
    for x in expense:
        total += x[4] if
        x[6] == "food":
        t_food += x[4]

        elif x[6] == "entertainment":
            t_entertainment += x[4]
        elif x[6] == "business":
            t_business += x[4]
        elif x[6] == "rent":
        t_rent += x[4]

        elif x[6] == "EMI":
            t_EMI += x[4]

        elif x[6] == "other": t_other
            += x[4]

    print(total)
print(t_food) print(t_entertainment)
print(t_business) print(t_rent)
print(t_EMI) print(t_other)
```

```
    return render_template("today.html", texpense = texpense, expense = expense, total =
total ,
                t_food = t_food,t_entertainment = t_entertainment,
                t_business = t_business, t_rent = t_rent, t_EMI =
                t_EMI, t_other = t_other )
```

```
#log-out
```

```
@app.route('/logout')


def logout():
   session.pop('loggedin', None) session.pop('id',
   None) session.pop('username', None)
   session.pop('email', None)
   return render_template('home.html')



port = os.getenv('VCAP_APP_PORT', '8080') if
name == "main":
    app.secret_key = os.urandom(12) app.run(debug=True,
    host='0.0.0.0', port=port)
```

deployment.yaml:

```
apiVersion:
apps/v1  kind:  Deployment  metadata:
name: sakthi-flask-node-deployment
spec:
   replicas: 1 selector:
     matchLabels:
       app: flasknode
   template:
     metadata: labels:
     app: flasknode
     spec:
       containers:
     - name: flasknode image:
       icr.io/sakthi_expense_tracker2/flask-template2
       imagePullPolicy: Always
         ports:
     - containerPort: 5000
```

flask-service.yaml:

```
apiVersion: v1 kind:
Service metadata: name:
flask-app-service
spec:
  selector: app:
    flask-app
  ports:
    - name: http protocol: TCP port: 80 targetPort:
      5000
type: LoadBalancer
```

manifest.yml:

```
applications:
    - name: Python Flask App IBCMR 2022-10-19
      random-route: true memory: 512M disk_quota:
      1.5G
```

sendemail.py:

```
import smtplib import
sendgrid as sg import
os
from sendgrid.helpers.mail import Mail, Email, To, Content SUBJECT
= "expense tracker"
s = smtplib.SMTP('smtp.gmail.com', 587)

def sendmail(TEXT,email):
    print("sorry we cant process your candidature")
    s = smtplib.SMTP('smtp.gmail.com', 587)
    s.starttls()
    # s.login("il.tproduct8080@gmail.com", "oms@1Ram")
    s.login("tproduct8080@gmail.com", "lxixbmpnexbkiemh")
    message = 'Subject: {}\n\n{}'.format(SUBJECT, TEXT) #
    s.sendmail("il.tproduct8080@gmail.com", email, message)
    s.sendmail("il.tproduct8080@gmail.com", email, message)
    s.quit()
def sendgridmail(user,TEXT):
```

```
# from_email = Email("shridhartp24@gmail.com")
from_email = Email("tproduct8080@gmail.com")
to_email = To(user) subject = "Sending with
SendGrid is Fun" content =
Content("text/plain",TEXT)
mail = Mail(from_email, to_email, subject, content)

# Get a JSON-ready representation of the Mail object mail_json
= mail.get()
# Send an HTTP POST request to /mail/send response =
sg.client.mail.send.post(request_body=mail_json)
print(response.status_code)
print(response.headers)
```

Database Schema

Tables :

1.Admin:

```
id INT NOT NULL GENERATED ALWAYS AS
IDENTITY,username VARCHAR(32) NOT NULL, email
VARCHAR(32) NOT NULL,password VARCHAR(32)
NOT NULL
```

2.Expense:

```
id INT NOT NULL GENERATED ALWAYS AS IDENTITY,
userid INT NOT NULL, date TIMESTAMP(12) NOT
NULL,expensename VARCHAR(32) NOT NULL, amount
VARCHAR(32) NOT NULL, paymode
VARCHAR(32) NOT NULL,
category VARCHAR(32) NOT NULL
```

3.LIMIT

```
id INT NOT NULL GENERATED ALWAYS AS
IDENTITY,userid VARCHAR(32) NOT NULL, limit
VARCHAR(32) NOT NULL
```

8. TESTING:

a.TestCases:

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	BUG ID	Executed By
LoginPage_TC_OO 1	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on My account button	1. Go to website 2. Enter Valid username and password	Username: Kavi password: 123456	Login/Signup popup should display	Working as expected	Pass	-		Kavinaya
Loginpage_TC_002	Functional	Home Page	Verify that the error message is displayed when the user enters the wrong credentials	1.Go to website 2.Enter Invalid username and password	Username: XXXX Password: 12345	Error message should displayed	Working as expected	Pass	-		Afra
LoginPage_TC_OO 2	UI	Home Page	Verify the UI elements in Login/Signup popup	1.Go to website 2.Enter valid credentials 3.Click Login	Username: Kavi password: 123456	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Pass	-		Abdul Waseem
LoginPage_TC_OO 3	Functional	Home page	Verify user is able to log into application with Valid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	User should navigate to user account homepage	Working as expected	Pass	-		Jayasri
LoginPage_TC_OO 4	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass	-		Afra
LoginPage_TC_OO 4	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass	-		Kavinaya
LoginPage_TC_OO 5	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass	-		Abdul Waseem
AddExpensePage_ TC _OO6	Functional	Add Expense page	Verify whether user is able to add expense or not	1. Add date, expense name and other details 2.Check if the expense gets added	add rent = 6000	Application adds expenses	Working as expected	Pass	-		Jayasri

b.User Acceptance Testing

1. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	8	15
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	9	2	4	11	20
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	0	1	8
Totals	22	14	11	22	51

2. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Interface	7	0	0	7
Login	20	0	0	20
Logout	2	0	0	2
Limit	3	0	0	3
Signup	8	0	0	8
Final Report Output	4	0	0	4

9. RESULTS

a. Performance Metrics

i. Tracking income and expenses: Monitoring the income and tracking all expenditures (through bank accounts, mobile wallets, and credit & debit cards).

ii. Transaction Receipts: Capture and organize your payment receipts to keep track of your expenditure.

iii. Organizing Taxes: Import your documents to the expense tracking app, and it will streamline your income and expenses under the appropriate tax categories.

iv. Payments & Invoices: Accept and pay from credit cards, debit cards, net banking, mobile wallets, and bank transfers, and

track the status of your invoices and bills in the mobile app itself. Also, the trackingapp sends remindersfor payments an d automatically matches the payments with invoices.

v. Reports: The expense tracking app generates and sends reports to give a detailed insight about profits, losses, budgets, income, balance sheets, etc.,

vi. Ecommerce integration: Integrateyour expense trackingapp wit h your eCommerce store and track your sales through payments received via multiple payment methods.

vii. Vendors and Contractors: Manage and track all the payments to the vendors and contractors added to the mobile app.

viii. Access control: Increase your team productivity by providing access control to particular users through custom permissions.

ix. Track Projects: Determine project profitability by tracking labor costs, payroll, expenses, etc., of your ongoing project.

x. Inventory tracking: An expense tracking app can do it all. Right from tracking products or the cost of goods, sending alert notifications when the product is running out of stock or the product is not selling, to purchase orders.

xi. In-depth insights and analytics: Provides in-built tools to generate reports with easy-to- understand visuals and graphics to gain insights about the performance of yourbusiness.

xii. Recurrent Expenses: Rely on your budgeting app to track, streamline, and automate all the recurrent expenses and remind you on a timely basis.

10. ADVANTAGES & DISADVANTAGES

1. **Achieve your business goals** with a tailored mobile app that perfectly fits your business.
2. **Scale-up** at the pace your business is growing.
3. Deliver an **outstanding** customer experience through additional control over the app.
4. Control the **security** of your business and customer data
5. Open **direct marketing channels** with no extra costs with methods such aspush notifications.
6. **Boost the productivity** of all the processes within theorganization.
7. Increase **efficiency** and **customer satisfaction** with an app aligned to their needs.
8. **Seamlessly integrate** with existing infrastructure.

9. Ability to provide **valuable insights**.

10. Optimize sales processes to generate **more revenue** through enhanced data collection.

11. CONCLUSION

From this project, we are able to manage and keep tracking the daily expenses as well as income. While making this project, we gained a lot of experience of working as a team. We discovered various predicted and unpredicted problems and we enjoyed a lot solving them as a team. We adopted things like video tutorials, text tutorials, internet and learning materials to make our project complete.

12. FUTURE

The project assists well to record the income and expenses in general. However, this project has some limitations:

1. The application is unable to maintain the backup of data once it is uninstalled.

2. This application does not provide higher decision capability.

To further enhance the capability of this application, we recommend the following features to be incorporated into the system:

3. Multiple language interface.

4. Provide backup and recovery of data.

5. Provide better user interface for user.

6. Mobile apps advantage.