NALAIYA THIRAN PROJECT BASED LEARNING ON PROFESSIONAL READLINESS FOR INNOVATION, EMPLOYNMENT AND ENTERPRENEURSHIP

Personal Expense Tracker Application

A PROJECT REPORT

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1.INTRODUCTION

1.1 Project Overview

Category: Cloud App Development

Team ID: PNT2022TMID43800

Required:

IBM Cloud, HTML, CSS, Javascript , IBM Cloud Object Storage, Python-

Flask, Kubernetes, Docker, IBM DB2, IBM Container Registry **Project**

Description:

Income and Expense Tracker will maintain data of daily, weekly, monthly, yearly expenses, Manages your expenses and earnings in a simple and intuitive way. The web application "Personal Expense Tracker" is developed to manage the daily expenses in a more efficient and manageable way. By using this application we can reduce the manual calculations of the daily expenses and keep track of the expenditure

This application will ask users to add their expenses and based on that their expenses wallet balance will be updated which will be visible to the user. Also, users can get an analysis of their expenditure in graphical forms. They have an option to set a limit for the amount to be used for that particular month if the limit is exceeded the user will be notified with an email alert.

1.2 Purpose

 In this project we propose a web application known as "Personal Expense Tracker" which is helpful to manage out income and expense as a daily or periodically or else whenever we want to remind. It also acts as an indicator or reminder example in the fastest world which we can't able to remember what are the things we have to do for the end of month and what are the payments we have to pay for the particular month. Due to some conflict or some other stress we forget some times that what are the income or where the money has to come from or what the payments we have to pay. This application will help you to make a note for what or the things we have to do for the end of month. For example, like how much it expenses for monthly and what are the expenses for a month. Some of the expense features like food expenses billing expenses like phone, electricity, taxation and some other personal expense. In this fast-moving world this web application will be very useful for a people who was a family and especially for a business people. Budgeting is an integral part of the society. Budget Tracking involves recording and analyzing the incomes and expenses of a person or an organization over a particular period of time. Today, since we are living in a hurry up and get it done society, many people are looking forward to efficient ways to budget their time and money. During the recent years, some research has been carried out on household budget. It has been noted that in most cases, budget management is being done mentally and never being put on paper which makes Budget Tracking very difficult.

2.LITERATURE SURVEY

2.1 Existing problem

In a study conducted by Forrester in 2016 surveying small and medium businesses (SMBs) across the world, 56% companies reported expense management as being the biggest challenge for their finance departments. In another survey conducted by Level Research in 2018 in North America, respondents reported the following pain points in expense management before adopting automation:

- Manual entry and routing of expense reports (62%)

- Lack of visibility into spend data (42%)

- Inability to enforce travel policies (29%)

- Lost expense reports (24%)

- Lengthy expense approval system and reimbursement cycles (23%)

2.2 References

| S.NO	TITLE	AUTHOR	YEAR	ABOUT
1	D2D Expense tracker application	Anjali Kumara, Utkarsh Raj	2021	D2D App aims to assist everybody WHO square measure progressing to understand their expenses and save from it. Here user will outline their own classes for expense sort like food, clothing, rent and bills wherever they need to enter the cash that has been spent and can also add some info in further info to specify the expense.
2	Expense tracker	Atiya Kazi, Praphulla.S	2020	This project is an android app which is used to track the daily expenses of the user. It is like digital record keeping which keeps the records of expenses done by a user. The application keeps the track of the Income and Expenses both of user on a day-to-day basis.
3	Expenditure management system	Dr.V.Geetha, G. Nikhitha	2022	In this project a weekly, monthly, and yearly basis, details of expenses will be displayed in the form of a pie chart. It aids us in remembering and adding information about what money we receive from others and what costs or payments we must make on a given date or month.
4	Expense Tracker	Miriam Thomas, Lekshmi.P, Dr.T.Mahalekshmi	2020	By using this application we can reduce the manual calculations of the daily expenses and keep track of the expenditure. In this application, user can provide his income to calculate his total expenses per day and these results will be stored for each user.
5	Tracking Expenses by Commodity at Widget Farmers Cooperative	Ramasamy	2004	Widget Farmers Coop (WFC) is a large retail agricultural supply cooperative with 12 locations in two states. It has over 40 million dollars in annual sales each year since its creation in 2004. WFC management would like to track expenses and identify areas of the business that are profitable and capitalize on them, as well as identify areas that are not profitable and realign or eliminate them.

2.3   Problem Statement Definition

PROBLEM STATEMENT:

Many organizations have their own system to record their income and expenses, which they feel is the main key point of their business progress. It is good habit for a person to record daily expenses and earning but due to unawareness and lack of proper applications to suit their privacy, lacking decision making capacity people are using traditional note keeping methods to do so. Due to lack of a complete tracking system, there is a 2 constant overload to rely on the daily entry of the expenditure and total estimation till the end of the month.

Who does the problem affect?	People getting regular wages.
What is the issue?	The paper based expense tracker system does not provide the user portability , existing system only used on paper based records so unable to update anywhere expenses done and unable to update the location of the expense details disruptive that the proposed system.
When does the issue occurs?	When the digits could not be recognized correctly. When the transactions are not successful. When the elder people unable to understand the smaller handwritten digits. When the paper based expense tracker records are subjected to fire accident, flood, etc.
Where is the issue occurring?	The issue occurs when the person is unable to track his income and expenditure.
Why is it important that we fix the problem ?	By solving this issue those people getting regular wages can track their expenses and avoid unwanted expenses.

3.IDEATION & PROPOSED SOLUTION

3.1 Empathy Map
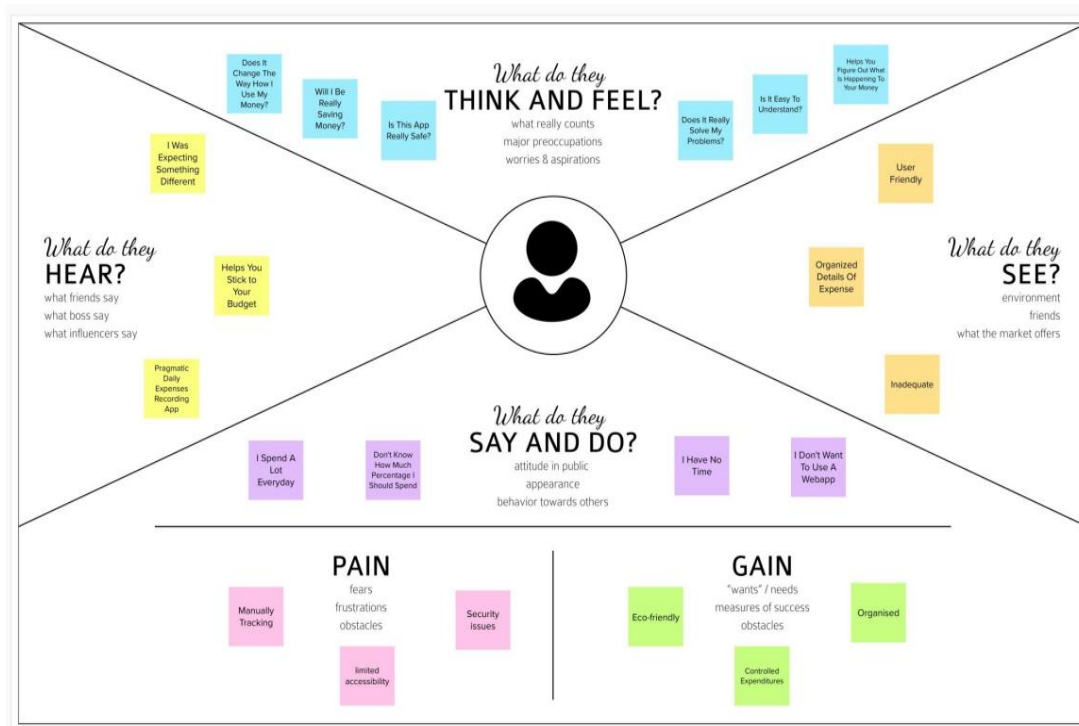
3.2 Idea on & Brainstorming

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

Step-2: Brainstorm, Idea listening and Grouping

Step-3: Idea Prioritization
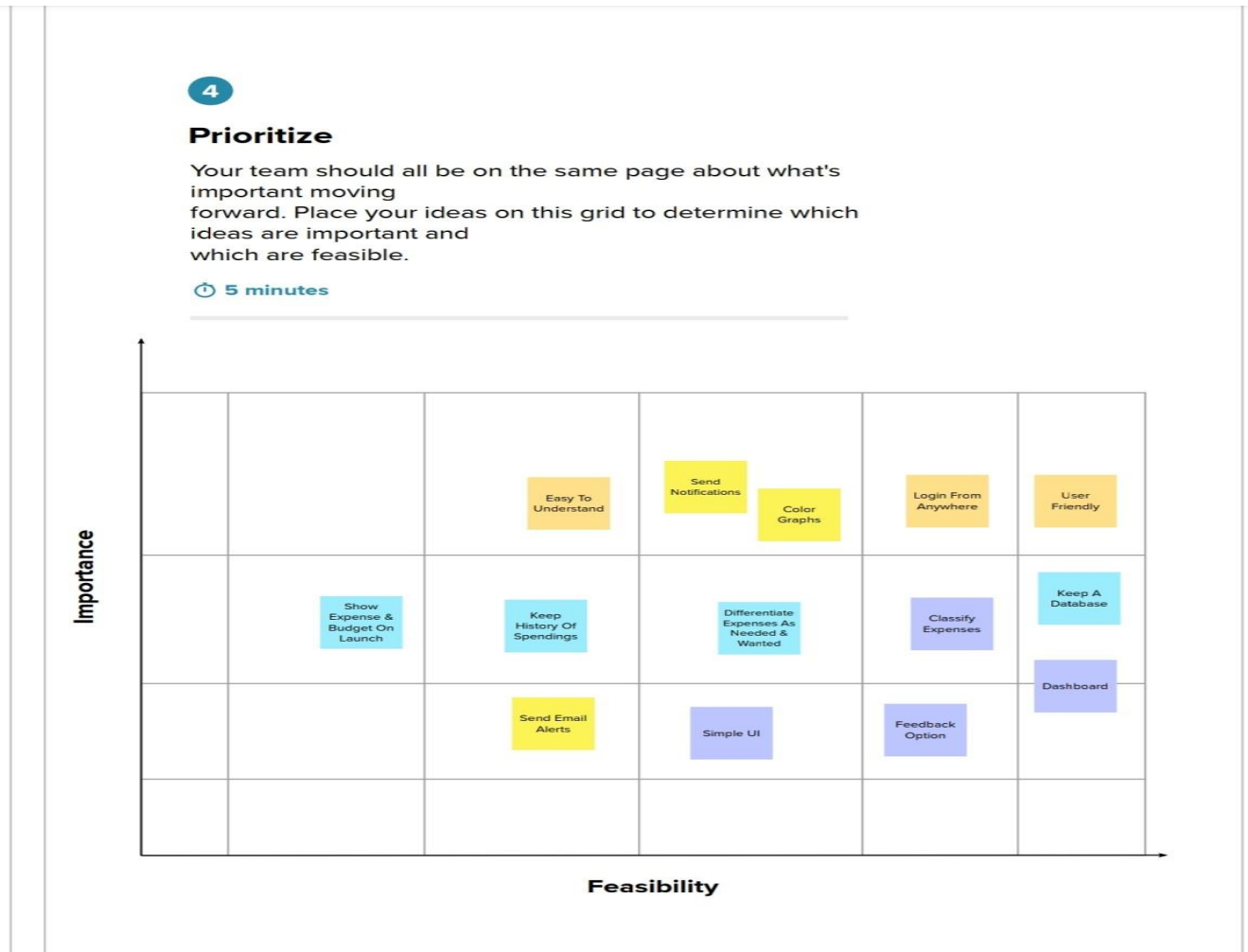
3.3 Proposed Solution

S.NO.	Parameter	Description
1.	Problem Statement	Nowadays the busy and hectic lifestyle of people tend to overlook their budget and spend an excessive amount of money since they usually don't plan their budget wisely.Therefore, user cannot predict future expenses.Using this personal expense tracking we can manage them easily, so it is more useful for the user to track expenses
2.	Idea / Solution description	To build a personal expense tracker which keeps track on your daily expenses .Deployed in IBM Cloud and leverage mail services like Sendgrid to implement the same.This application keeps a check on all the expenses the user spends, fix a budget and sends a notification. If it exceeds, compare the expenses spent for each category and gives a monthly report too.
3.	Novelty / Uniqueness	The stats generated with visual graphs are more effective than log books. ¬ Personal expense tracker allows financial transactions through debit cards, bank transfers, credit cards, and net banking will help you make payments quickly against the invoices. ¬ It will also send reminders for payments and match the payments. ¬ It has a bot that can understand and answer all queries & address user needs like account balance, credit score etc. ¬ More than one account can be handled in a single profile. ¬ Instead of manually adding, they can be tracked automatically

4.	Business Model (Revenue Model)	Premium/Upselling in which a user may access the application for free, but will be charged for additional functions, services, bonuses, plugins, or extensions. We can provide advertisement-based revenue model which will make use of third-party advertisers. The ads will, in turn, generate revenuethat the application will use to cover its maintenance costs and staff salaries, leaving the profit. A profile can hold multiple accounts at different subscription levels
5.	Social Impact / Customer Satisfaction	It is possible for users to spend the money wisely if they use this properly. ¬ It is more helpful for the middle class people. ¬ Through this, controlling unnecessary expenses for non essential items is possible
6.	Social Impact / Customer Satisfaction	Personal Expense Tracker is capable of handling huge number of user data and API calls simultaneously. Enhancements to the app through expert customer services. Has a feature where the user can create a family account for family expenses, which includes each person's expense as a whole, excluding personal expenses. Bill amounts can be scanned for expenditures. Direct retrivels of expenses made through cards and UPI's
7.	Feasibility of Idea	Compatible with all browsers. Economically safe as it doesn't handle with transactions. We can use this app without fear of scams

3.4 Problem Solution fit

Problem-Solution Fit canvas

Purpose / Vision

Version:

1. CUSTOMER SEGMENT(S) — CS

Define CS, fit into CL

- College students who live alone
- Working professionals
- Old aged people

6. CUSTOMER LIMITATIONS EG. BUDGET, DEVICES — CL

➢ User's budget won't be stable all the time

➢ Network connection might not be available all the time for the user

5. AVAILABLE SOLUTIONS PROS & CONS — AS

➢ Shows many options for someone who does not understand investment ideas.

2. PROBLEMS / PAINS + ITS FREQUENCY — PR

Focus on PR, tap into BE, understand RC

➢ Show historical stats
➢ System does not provide alternative for investing their saved money.

➢ Each month when money is saved

9. PROBLEM ROOT / CAUSE — RC

➢ Carefree money managing attitude of the people.

➢ Illiteracy is the root cause for all the problems.

7. BEHAVIOR + ITS INTENSITY — BE

➢ Direct:
Lack of an app results in traditional bookkeeping methods

➢ Indirect:
People can create awareness about this app's benefits even if they don't use it

➢ During public gathering events
➢ Server out of service

3. TRIGGERS TO ACT — TR

Identify strong TR & EM

➢ Frequent sales in e-commerce Platforms and seamless shopping experience online

4. EMOTIONS BEFORE / AFTER — EM

➢ Before:
Fear,feelings,struggling,hopeless

➢ After: Relief,Tranquil

10. YOUR SOLUTION — SL

➢ Graphical Application with simple UI and to the point clutter free objective.
➢ Avoids provision to pay through the app, to minimize the spending and ensure that only necessary spendings are made.
➢ The aim is to make the spending process harder throughout the application and keep it clean.

8. CHANNELS of BEHAVIOR

ONLINE

➢ Shop from e-commerce
➢ Order food frequently

OFFLINE

➢ Shop in mall during sales
➢ Lose of money by means of theft

Problem-Solution fit canvas is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. Designed by Daria Nepriakhina / IdeaHackers.nl - we tailor ideas to customer behaviour and increase solution adoption probability.

IdeaHack

4.REQUIREMENT ANALYSIS

4.1 Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement(Story / Sub- Task)
FR- 1	User Registration	Form for collecting details

FR- 2	User Confirmation	Enter username and password
FR- 3	User monthly expense tentative data	Data to be registered in the app
FR- 4	User monthly income data	Data to be registered in the app
FR- 5	Alert / Notification	Alert via E-mail
FR- 6	User Budget Plan	Planning and Tracking of user expenses vs. budget limit

4.2 Non-Functional requirements

FR No.	NonFunctional Requirement	Description
NFR-1	Usability	Effectiveness, efficiency, and overall satisfaction of the user while interacting with the application.
NFR-2	Security	Authentication and encryption of the application
NFR-3	Reliability	Probability of failure-free operations in a specified environment for a specified time
NFR-4	Performance	How the application is functioning and how responsive the application is to the end-users.
NFR-5	Availability	In spite of the lack of an active internet connection all features of the application are accessible. Synchronization of data cannot be done
NFR-6	Scalability	The capacity of the application to handle growth, especially in handling more users

5.PROJECT DESIGN

5.1 Data Flow Diagrams

LEVEL 0: DIAGRAM OF THE SYSTEM
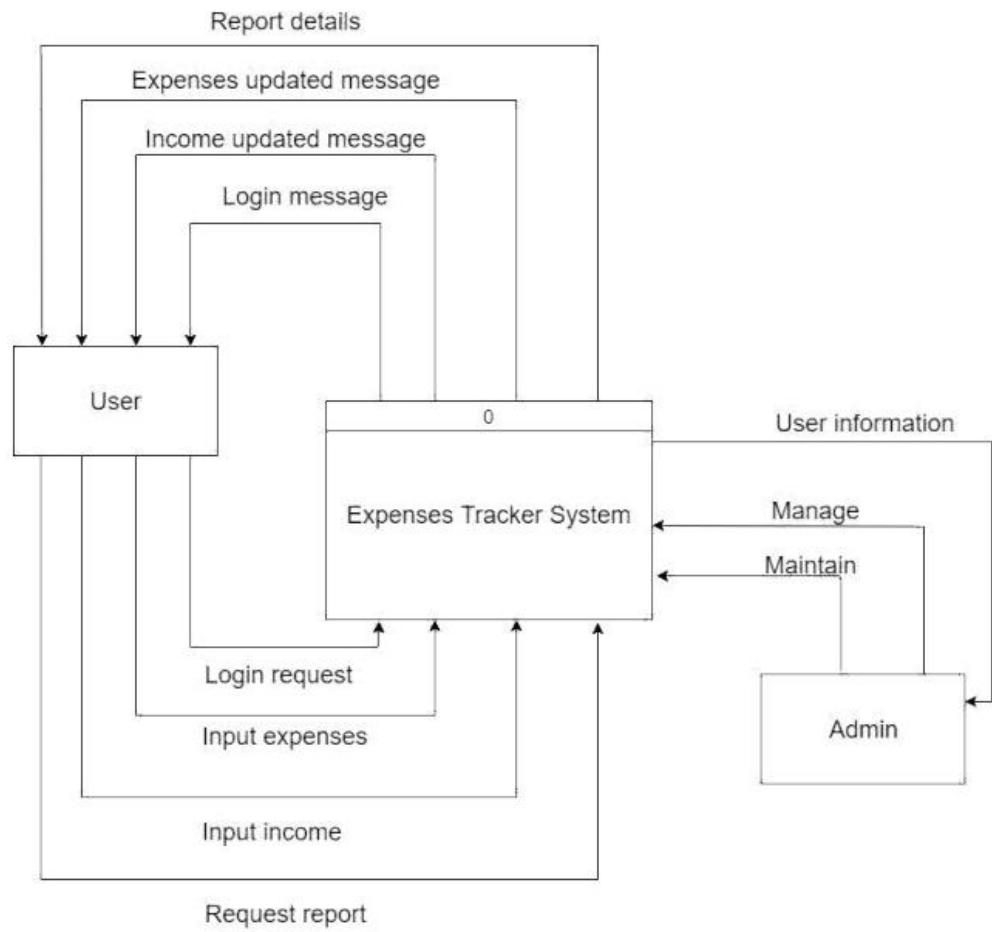
LEVEL 1: ADMIN DIAGRAM

LEVEL 1: USER DIAGRAM

LEVEL 2: LOGIN PROCESS

```
                                                                    Invalid
                                                            ┌────────────────────────┐
                                                            ↓                        │
┌──────────┐  Registration   ┌──────────────┐  Registration  ┌──────────────┐
│          │    request      │     1.1      │     form        │     1.2      │
│   User   │ ──────────────→ │ User         │ ──────────────→ │ Verify       │
│          │                 │ registration │                 │ registration │
└──────────┘                 └──────────────┘                 │ form         │
                                                               └──────────────┘
                                                                      │
   D │ User                                                           │ Valid
┌────────────┐                                                        ↓
     │                                                          D │ User
     ↓                                                        
┌──────────────┐   Invalid    ┌──────────────┐  ID, password  ┌──────────┐
│     1.4      │ ←─────────── │     1.3      │ ←───────────── 
│ ID and       │              │ Verify       │    details
│ password     │              │ password     │
│ recovery     │              │ and ID       │
└──────────────┘              └──────────────┘
     │                               │
     │                               ↓
     │                        ┌──────────────┐
     │  Access request valid  │     1.5      │  Access authorization
     └──────────────────────→ │ Login to     │ ──────────────────→
                              │ system       │
                              └──────────────┘
```

LEVEL 2: MANAGE INCOME

```
                    Access          ┌──────────┐  Income form  ┌──────────────┐
     ┌────────────┐ authorization   │   2.1    │               │     2.2      │
     │    User    │ ──────────────→ │ Add      │ ───────────→  │ Verify new   │
     │            │                 │ income   │               │ income       │
     └────────────┘                 └──────────┘               └──────────────┘
       │                                                               │
       │ Edit                                                          │ Enter
       │ user income                                                   │ new income
       ↓                                                               ↓
     ┌──────────┐                ┌──────────────┐                ┌──────────┐
     │   2.3    │                │     2.4      │  Income        │ D │ Income │
     │ Edit     │ ─────────────→ │ Edit income  │ ←───────────   │          │
     │ income   │                │ form         │    details
     └──────────┘                └──────────────┘
                                         │
     Delete                              ↓
     user income                  ┌──────────────┐
                                  │     2.5      │  Update income
                                  │ Verify       │ ───────────────→
                                  │ edited       │
                                  │ income form  │
                                  └──────────────┘
     ┌──────────┐
     │   2.6    │
     │ Delete   │        Update income
     │ income   │ ───────────────────────→
     └──────────┘
```
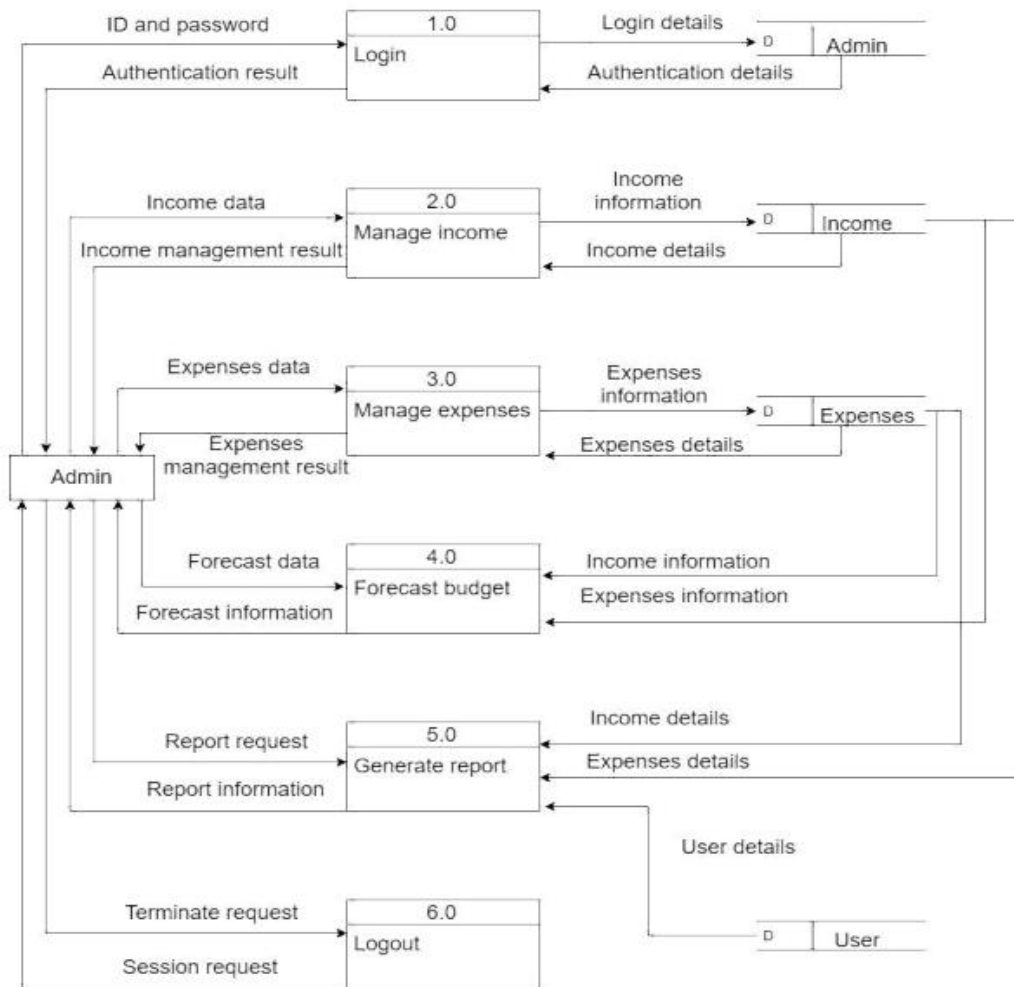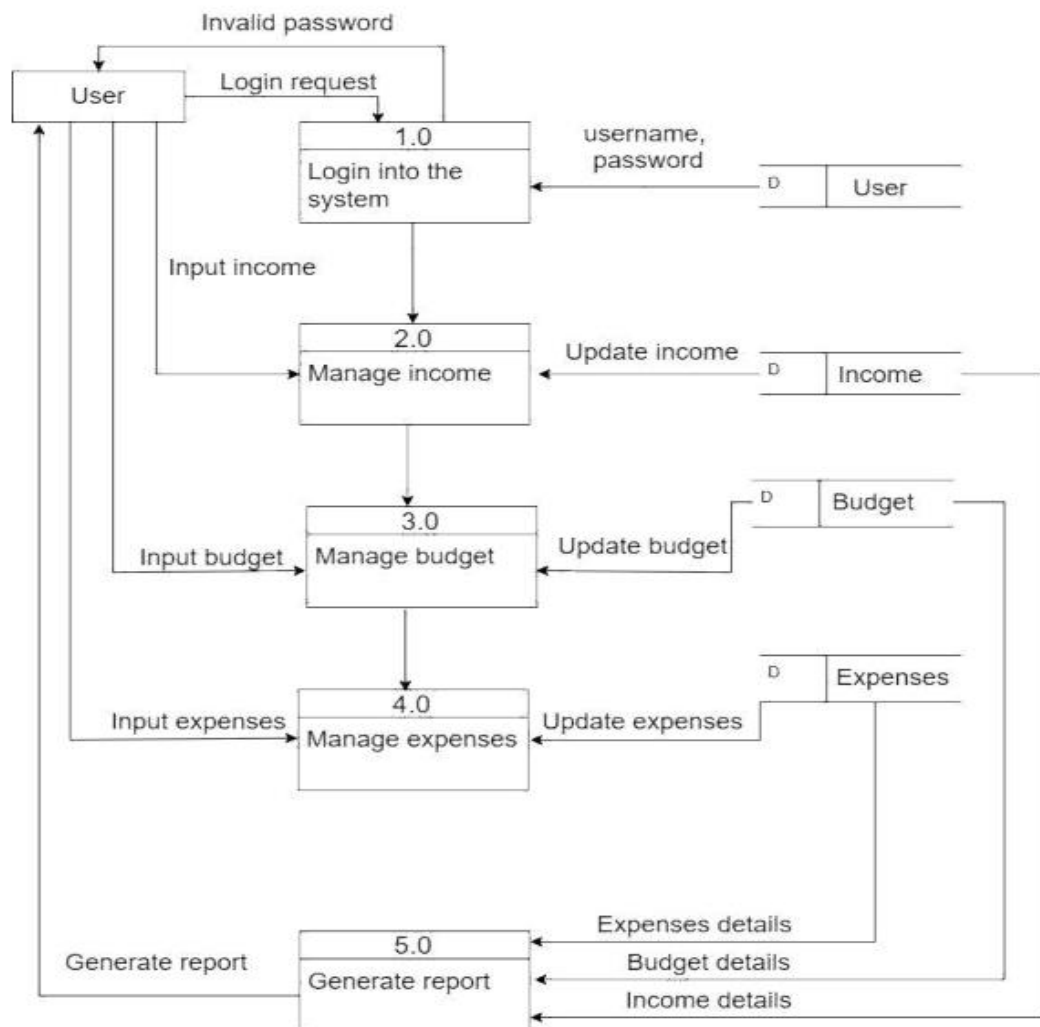
LEVEL 2: MANAGE EXPENSES
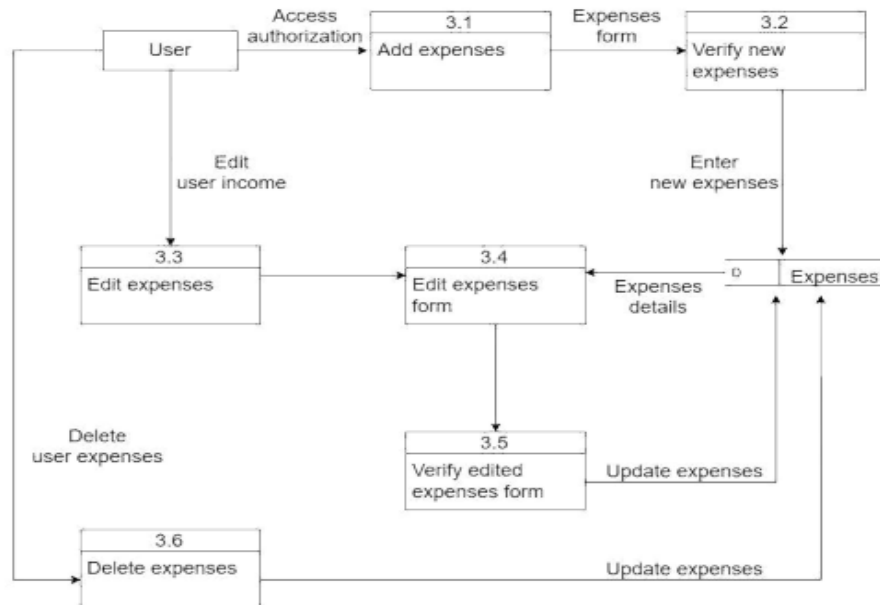
LEVEL 2: REPORT GENERATION PROCESS
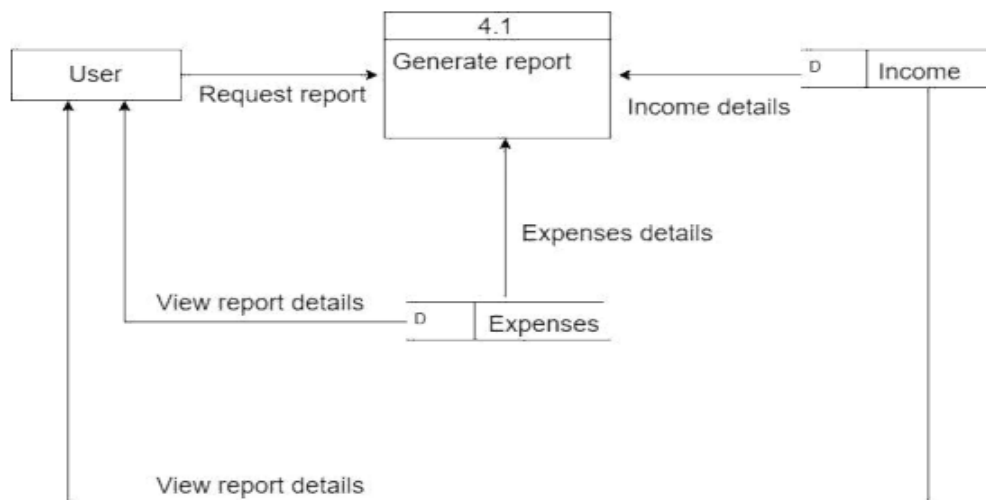
5.2 Solution & Technical Architecture

Technical Architecture:
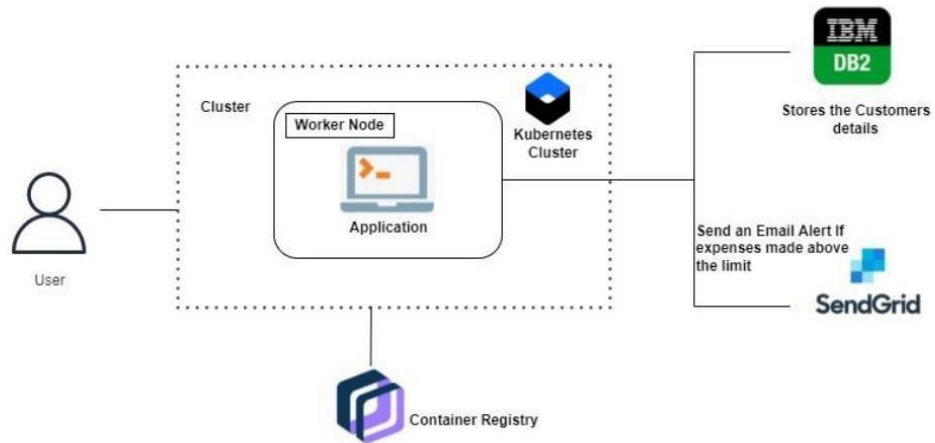
Solution Architecture

ACTIVITY DIAGRAM:
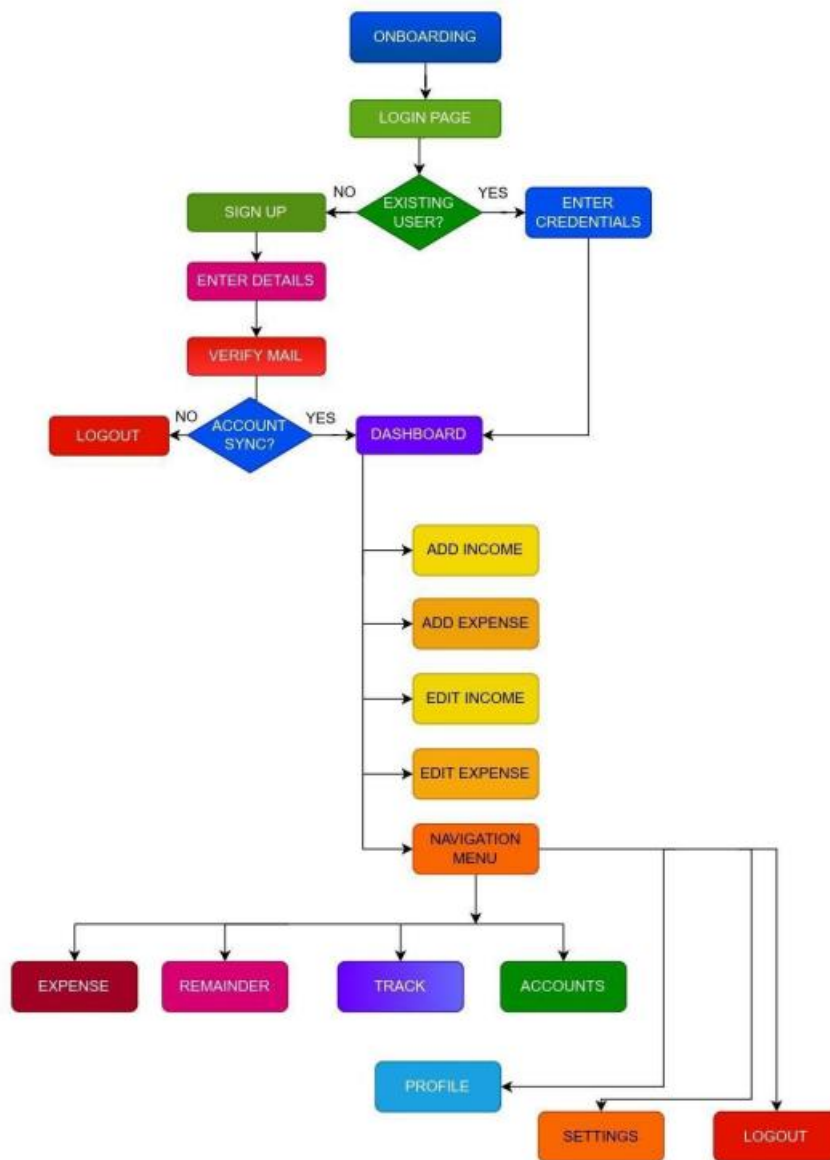
SEQUENCE DIAGRAM:
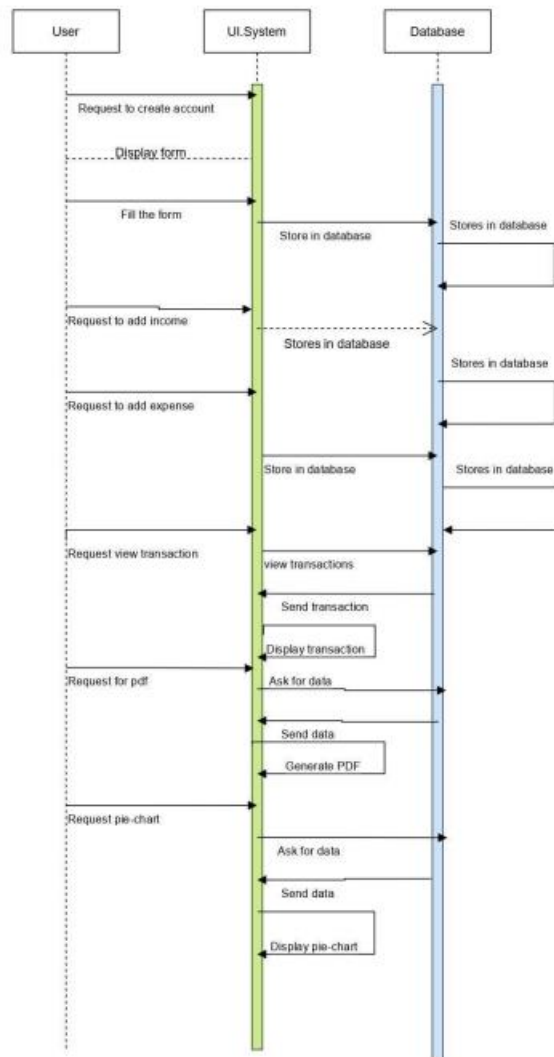
6.PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

Sprint	Functional Require ment (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by ente ring my email, password, and confirming my password.	8	High	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC

Sprint		USN	Description	Points	Priority	Team
Sprint-1	Login	USN-2	As a user, I can log into the application by entering email & password	8	High	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC
Sprint-2	Add Expense	USN-3	As a user, I can add the day-today expense to the application	5	Medium	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC
Sprint-2	Edit and Delete Expense	USN-4	As a user, I can edit and delete the previously created expense	5	Medium	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC
Sprint-3	Creating time based filters in history.	USN-5	As a user, I can see the time based history of expenses.	8	High	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC
Sprint-3	Integrating with piecharts for analysis	USN-6	As a user, I can view diagrammatic representation of expenses	5	Medium	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC
Sprint-4	Enabling limit feature	USN-7	As a user, I can set monthly limit to expenses	5	Medium	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC
Sprint-4	Sending Email Alerts	USN-8	As a user, I will receive a mail if I cross a limit	8	High	AASHIQ ROSHAN ,AHSAN M,ASHIQ ANWAR,MUHAMMEDSINANKC

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	P Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	23 Oct 2022	28 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	30 Oct 2022	04 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	06 Nov 2022	11 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	13 Nov 2022	18 Nov 2022	20	19 Nov 2022

Velocity

We have a 6-day sprint duration, and the velocity of the team is 20 (points per sprint).

Calculating the team's average velocity (AV) per iteration unit (story points per day)

AV = sprint duration / velocity = 20/6 = 3.33

Burn down Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.
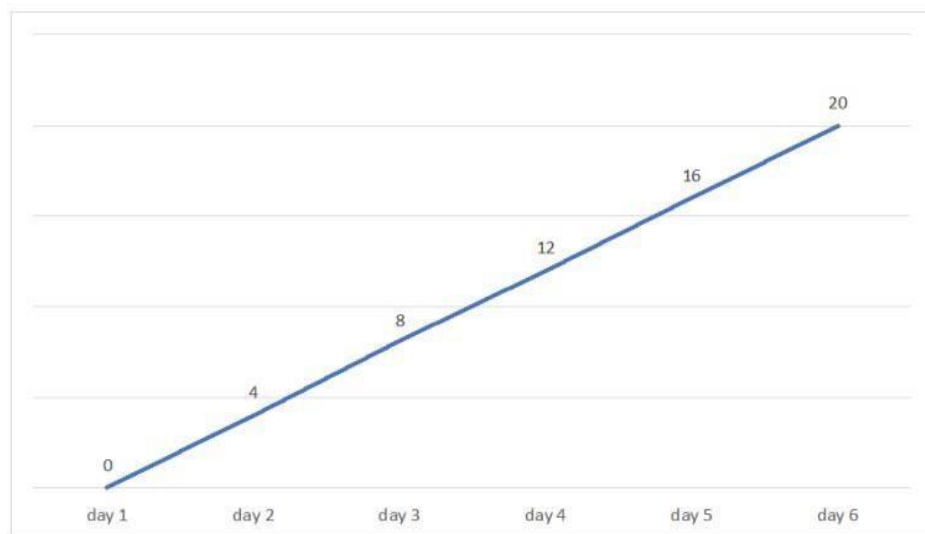
Sprint duration

6.3 Reports from JIRA

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

7.1. FEATURE 1

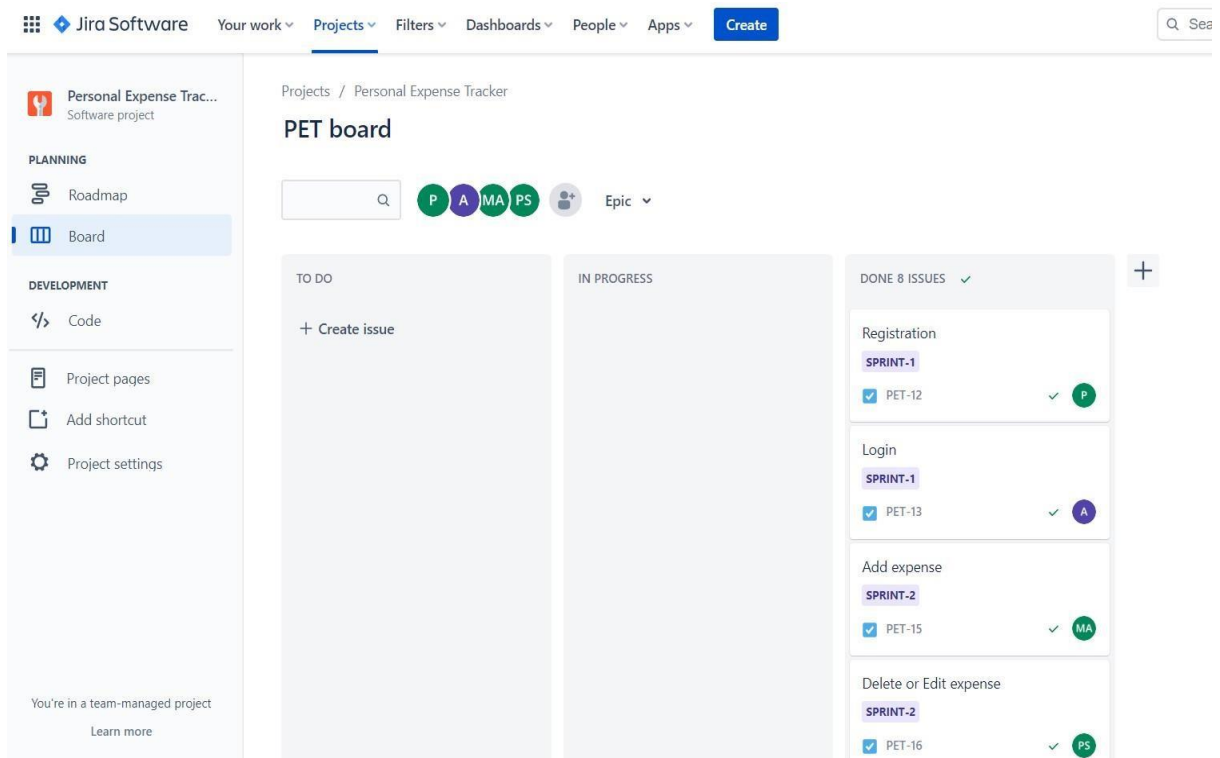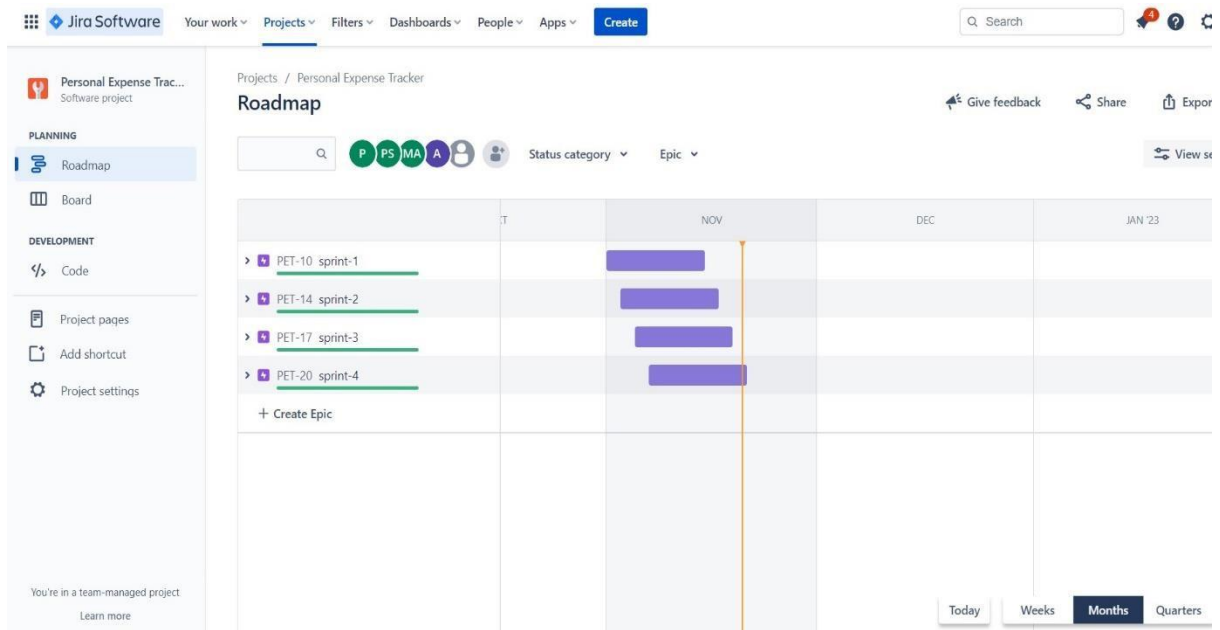We have added the data visualization methods for expenditure. The pie chart have been used to represent the monthly expenses. The pie chart is a pictorial representation of data that makes it possible to visualize the relationships between the parts and the whole of a variable. For example, it is possible to understand the industry count or percentage of a variable level from the division by areas or sectors. The recommended use for pie charts is two-dimensional, as three-dimensional use can be confusing.

The dimensions form sectors of the measurement values; they can have one or two sizes and up to two measures. The first dimension is used to define the angle of each sector that makes up the chart and the second dimension optionally determines the radius of each sector. Additionally, these plots are useful for comparing data over a fixed period since they do not show changes over time. Therefore, their use should be considered if:

- You are looking to categorize and compare a set of data.

- You only have positive values.

- You have less than seven categories since a larger number can make it difficult to perceive each segment.

CODE:

Signup.html

```
<html>
<head>
<meta charset="utf-8">
```

```html
<title>Sign-up</title>

<link href="..\static\css\signup.css" rel="stylesheet">

<script src="https://kit.fontawesome.com/a81368914c.js"></script>

<link                                                       rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">

</head>

<body>

 <!--container--------------------->

<div class="container" >

 <!--sign-up-box-container--->

<div class="sign-up">

<div  id="png"><a  href="/"  title="HOME"><img  style="width:55px;  height:55px  ;  "
src="..\static\images\home-page.png"></a></div>

 <!--heading-->

 <form action="/register" method="post">

   <div class="msg">{{ msg }}</div>

<h1 class="heading">Hello,Friend</h1>

<!--name-box-->

<div class="text">

<img height="20px" src="..\static\images\user.png" />

<input placeholder="Name" type="text" name="username"/>

 </div>

 <!--Email-box-->

<div class="text">

 <img height="12px" src="..\static\images/email.png" />

 <input placeholder=" Example@gmail.com" type="email" name="email"" /> </div>
```

```html
<!--Password-box-->
<div class="text">
<img height="20px" src="..\static\images\password.png" />
<input placeholder=" Password" type="password" name="password"/>
</div>
<div class="or"><b>OR</b></div>
<div class="s1"><p><b>Sign-up with</b></p></div>
<div>
  <ul>
    <li><a href="#"><i class="fab fa-facebook" aria-hidden="true"></i></a></li>
    <li><a href="#"><i class="fab fa-twitter" aria-hidden="true"></i></a></li>
    <li><a href="#"><i class="fab fa-google"  aria-hidden="true"></i></a></li>
    <li><a href="#"><i class="fab fa-linkedin" aria-hidden="true"></i></a></li>
    <li><a href="#"><i class="fab fa-instagram" aria-hidden="true"></i></a></li>
  </ul>
  </div>
<!--trems-->
<div class="trems">
<input class="check" type="checkbox" required/>
<p class="conditions">I read and agree to <a href="#">Trems &amp; Conditions</a></p>
</div>
<!--button-->
<div class="toop">
<button type="submit" class="btn btn-primary" >CREATE ACCOUNT</button> </div>
</form>
<!--sign-in-->
```

```html
<div class="t"><p class="conditions" id="p3">Already have an account
    <a href="/signin">Sign in</a></p> </div></div>

 </div>

<!--text-container-->

<div class="text-container">

<h1 style="color: #2d2c2c;font-family:cursive;">Glad to see you</h1>

<div class="diag"><img class="fig1" width="100%" height="105%"
src="..\static\images\Inkeddia_LI.jpg"</div>

<div class="para"> <b>Welcome</b>,Please Fill in the blanks for sign up</div>

 </div>

 </div>

</body>

</html>
```

App.py

```python
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'
    """
dsn_hostname = "ba99a9e6-d59e-4883-8fc0-
d6a8c9f7a08f.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud"
dsn_uid = "vmk08423" dsn_pwd = "3KfJl6HGDtPdbIWy" dsn_driver
= "{IBM DB2 ODBC DRIVER}" dsn_database = "bludb" dsn_port =
"31321" 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'] = 'ba99a9e6-d59e-4883-8fc0-
d6a8c9f7a08f.c1ogj3sd0tgtu01qde00.databases.appdomain.cloud'
app.config['port'] = '31321' app.config['protocol'] =
'tcpip' app.config['uid'] = 'vmk084230' app.config['pwd'] =
'3KfJl6HGDtPdbIWy' app.config['security'] = 'SSL' try:
mysql = DB2(app)
    conn_str='database=bludb;hostname=ba99a9e6-d59e-4883-8fc0-
d6a8c9f7a08f.c1ogj3sd0tgtu01qde00.databases.appdomain.cloud;port=31321;prot
ocol=tcpip;\
          uid=vmk08423;pwd=3KfJl6HGDtPdbIWy;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())
#HOME--PAGE
@app.route("/home") def
home():
    return render_template("homepage.html")

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

7.2. FEATURE 2

Email notifications will be sent to the users once they cross the expenditure
limit through send grid mail system. Most notifications are transactional,
meaning a recipient's action or account activity triggers them. But some
notifications are marketing related, encouraging the recipient to take a specific
action. Ecommerce product notifications inform recipients about new
products or discounts. Plus, unlike general marketing emails, these are highly
personalized and focus on a single product. For example, if a customer views
an item on your website and that item goes on sale, you can send the customer
a notification to let them know this is the best time to buy. Users can also opt
into receiving notifications when an out-ofstock item is back in stock.

Notification emails tend to perform well because the content is highly relevant to the recipient. But the only way for the recipient to know this is if you state the content clearly in the subject line.

For example, the subject line "New Sign-in to Your Account" gets straight to the point, letting the user know why you sent this notification.

Sendemail.py

```python
def sendgridmail(user,TEXT):

    # from_email = Email("mohamedriyazafzal@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)
```

7.3 Database Schema

Tables

REGISTER

id INT NOT NULL GENERATED ALWAYS AS IDENTITY, username VARCHAR(255) NOT NULL, email VARCHAR(255) NOT NULL, password VARCHAR(255) NOT NULL

EXPENSES id INT NOT NULL GENERATED ALWAYS AS

IDENTITY, userid INT NOT NULL,

date TIMESTAMP NOT NULL,

expensename VARCHAR(255) NOT

NULL, amount INT NOT NULL, paymode

VARCHAR(255) NOT NULL, category

VARCHAR(255) NOT NULL

LIMITS

id INT NOT NULL GENERATED ALWAYS AS IDENTITY, userid VARCHAR(255) NOT NULL, limitss VARCHAR(255) NOT NULL

8. TESTING

8.1 TEST CASES

TEST CASE ID	PURPOSE	TEST CASES	RESULT
TC1	Authentication	Password with length less than 4 characters	Password cannot be less than 4 characters
TC2	Authentication	User name with length less than 2 characters	User name cannot be less than 2 characters
TC3	Authentication	Valid user name with minimum2 characters	User name accepted
TC4	Authentication	User name left blank	User name cannot be less than 2 characters
TC5	Authentication	Password field left blank	Password cannot be empty
TC6	Authentication	Minimum 4 characters valid password	Password accepted
TC7	Authentication	Password and Confirm Password did not match	Please enter same password
TC8	Authentication	Confirm Password field left blank	Please enter same password

8.2 USER ACCEPTANCE TESTING

Technical Requirment Document (TSD)	
Test Case ID	**Test Case Description**
TC_001	Verify if user is able to order single product.
TC_002	Verify if user is able to order multiple products.
TC_003	Verify if user can apply single or multiple filters
TC_004	Verify if user can apply different sort by
TC_005	Verify if user is able to pay by Master Card
TC_006	Verify if user is able to pay by Debit Card
TC_007	Verify if user is able to pay fully by reward points
TC_008	Verify if user is able to pay partially by reward points

9. RESULTS

9.1 Performance Metrics

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

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

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

●   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 tracking app sends reminders for payments and automatically matches the payments with invoices.

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

●   E-commerce integration: Integrate your expense tracking app with your eCommerce store and track your sales through payments received via multiple payment methods.

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

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

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

●   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.

●   In-depth insights and analytics: Provides in-built tools to generate reports with easy-tounderstand visuals and graphics to gain insights about the performance of your business. ● 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 And Disadvantages :

Advantages:

1.Improved visibility:

　　　Most expense management software includes a dashboard that compiles employee expense data and presents it in an easy-to-understand visual format using charts and other graphics.

2.Security:

　　　All the Data's are stored in ibm cloud and db2 so all the data are maintained safely.

3.Month wise Comparison:

　　　Using the Expense Manager, you can easily make month on month comparisons of earning, expenses and spending in a more organized manner.

4.Alert Mail:

　　　User Receives the alert mail when they exceed the expense limit.

5.Automation:

　All the calculations are automated. Graph are generated based on the expense made.

6.User Friendly:

　　　Expenses can be added easily.

Disadvantage:

1.Requires Internet Connection:

　　　This web application requires an active internet connection to access.

2.Cost:

　Using cloud service need some investments. Every time we can't access the cloud freely.

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 SCOPE:

1.User can able to upload the receipt of their expenses made.

2.Application will make suggestion to reduce unnecessary expense.

3.User get remainder in email to add their daily expense.

4.User can able to link bank accounts with our application

13.Appendix:

Github Source code link:

https://github.com/IBM-EPBL/IBM-Project-49383-1660818473

Project Demo Link:

https://drive.google.com/file/d/11qzco-QJTVEEFo8K-KopfFjS0l8544S1/view