

PERSONAL EXPENSE TRACKER APPLICATION

PROJECT REPORT

Submitted by,

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BACHELOR OF ENGINEERING

In

**DEPARTMENT OF ELECTRONICS AND
COMMUNICATION ENGINEERING**



V.S.B ENGINEERING COLLEGE

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1.INTRODUCTION

TEAM ID: PNT2022TMID33587

INDUSTRY MENTOR: Kusboo

FACULTY MENTOR: P. Nandhini

1.Project Overview

Skills Required:

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

The art of money management is all about turning your money into wealth by reframing your mindset; instead of thinking of managing money in terms of just expenses, you should also think of money as an investment tool. A defined money management plan incorporates wealth accumulation, protection of accumulated wealth, and preservation of wealth.

These key financial concepts are tied to your specific needs, objectives, financial goals, priorities, and risk factors. Businesses often find it hard to focus on money management due to varied cash flows. Therefore, businesses shift their focus to behavioural influences (spending, savings, investments) that affect their decision-making strategies for managing their money.

The need for an expense tracking app A comprehensive money management strategy requires clarity and conviction for decision-making. You will need a defined goal and a clear vision for grasping the business and personal finances. That's when an expense tracking app comes into the picture.

An expense tracking app is an exclusive suite of services for people who seek to handle their earnings and plan their expenses and saving efficiently. It helps you track all transactions like bills, refunds, payrolls, receipts, taxes, etc., on a daily, weekly, and monthly basis.

2.Purpose

Personal financemanagement is an important part of people'slives.

However, everyone does 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 manager and money manager, an expense tracker is 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 towards the end of the month they don't have sufficient money to meet their needs. While this problem can arise due to low salary, 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 manager can help you keep track of how much you spend every day and on what. At the end of the month, you will have a clear picture where your money is going.

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 help them out. Before you decide to go in for a money manager, it is important to decide the type you want.

2.LITERATURE SURVEY

1.Existing Problem

Now a day's people are concerned about regularity of their daily expenses. This is done mainly for keep a track of the users' daily expenses to have a control of users' monthly expenses. We have developed an android application named as the traditional methods of budgeting, we need to maintain the Excel sheets, Word Documents, notes, and files for the user daily and monthly expenses.

Keeping a log in diary is a very monotonous process and also may sometimes lead into problems due to the manual calculations. Looking on all the above given conditions, we are trying to satisfy the user requirements by building a mobile

application which will help them reduces their burdens. With the help of this application, user can calculate his total expense...

2.References

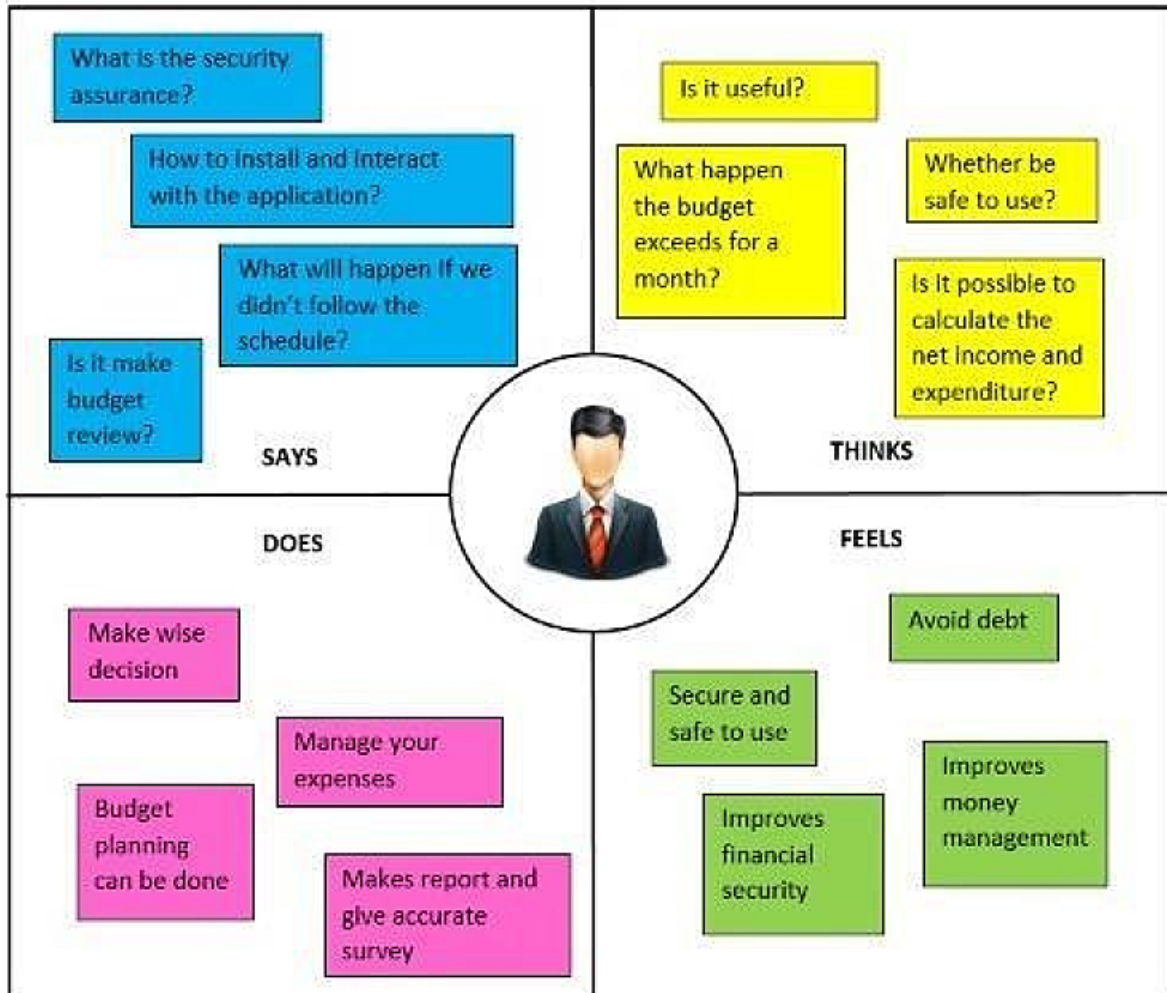
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3.Problem Statement

Our application functions and comparing them to other existing applications, some features were found lacking. This is a new application that will attract the public user through its features. There are always some challenges. We have to face some challenges as well, since the main purpose of our application is to track the user's expenses. This is an Android-based mobile application, so if a user does not have an Android phone then this application will not help him. After getting notifications if a user doesn't check his phone for full information then the main motto of this app will fail.

3.IDEATION AND PROPOSED SOLUTION

3.1.Empathy Map Canvas



3.2. Ideation and Brainstorming:

Step-2: Brainstorm, Idea Listing and Grouping

Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

20 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

10 minutes

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

Template

Brainstorm & ideaprioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

10 minutes to prepare
1 hour to collaborate
2-8 people recommended

Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

1. Team gathering
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.
2. Set the goal
Think about the problem you'll be focusing on solving in the brainstorming session.
3. Learn how to use the facilitation tools
Use the Facilitation Superpowers to run a happy and **collaborative** session.

Open article →

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

PROBLEM

How might we track personal expenses?

Key rules of brainstorming

To run a smooth and productive session

Stay in topic.

Defer judgment.

Do for volume.

Encourage wild ideas.

Listen to others.

If possible, be visual.

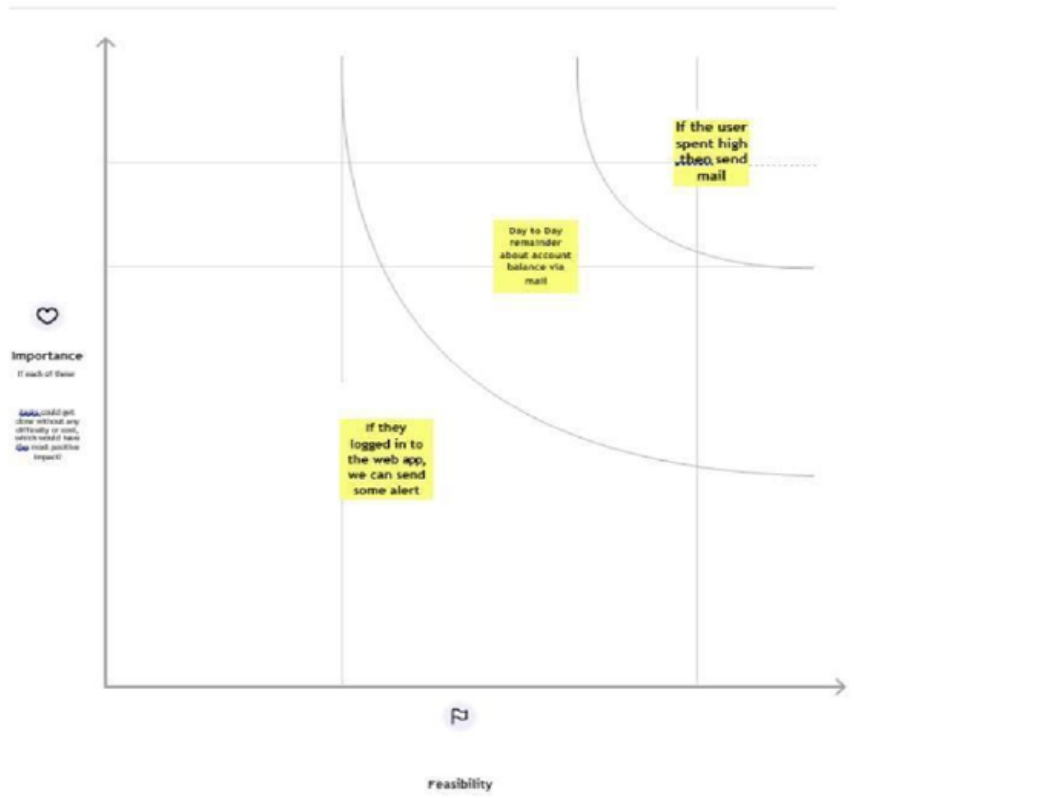
Step-3: Idea Prioritization



Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



3.3.Proposed solution

S.No	Parameter	Description
<u>1.</u>	Problem Statement (Problem to be solved)	At the end of the month we start to have money crisis. Lack of proper planning of our income. Person has to keep a log in a diary or in a computer. All the calculations need to be done by the user. Overload to rely on the daily entry of the expenditure.
<u>2.</u>	Idea / Solution description	An expense tracker app allows you to monitor and categorize your expenses across different bank and investment accounts and credit cards. Some of these apps also offer budgeting tools, credit monitoring, mileage tracking, receipt keeping, and advice to grow your net worth.
<u>3.</u>	Novelty / Uniqueness	Expense tracker apps help you collect and classify your purchases so that you can identify areas that might be trimmed. Or, in the case of building net worth, places where you can allocate more money, such as savings. You might track expenses for a while just to get an idea of where your money's going, or it might be a stepping stone toward making and following a budget.
<u>4.</u>	Social Impact/ Customer Satisfaction	Make wise decision Manage your expenses Budget planning can be done Make report and give accurate survey

<u>5.</u>	Business Model (Revenue Model)	Cost Effective
<u>6.</u>	Scalability of the Solution	Secure and safe to use Improves money management

3.4. Problem Solution fit

<u>1.Customer segments:-</u> An expense tracker 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 towards the end of the month they don't have sufficient money to meet their needs.	<u>6.Customer constraints:-</u> If you are not using an expense tracker, you are missing out on the ability to manage your finances wisely and effortlessly. You will end up spending money without even realising it, and your daily expenses will go through the roof.	<u>5.Available solutions</u> Using charts and graphs may help you monitor your budgeting, assets, and performance and keep your personal and business costs distinct.
<u>2.Jobs to be done :-</u> When you track your spending, you know where your money goes and you can ensure that your money is used wisely. Tracking your expenditures also allows you to understand why you're in debt and how you got there.	<u>9.Problem route cause :-</u> As the traditional methods of budgeting, we need to maintain the Excel sheets, Word Documents, notes, and files for the user daily and monthly expenses. There is no as such full-fledged solution to keep a track of our daily expenses. Looking on all the above given conditions, we are trying to satisfy the user requirements by building a application	<u>7.Behavior:-</u> With the help of this application user can track their daily/weekly/monthly expenses. This application will also have a feature which will help you stay on budget because you know your expenses.
<u>3.Triggers:-</u> While every reasonable budget aims to cater to your financial history, needs, and goals, it can be tricky to expect your budget to solve all your financial problems.	<u>10.Solution:-</u> These apps certainly overlap with budgeting apps, but while the latter provides a big-picture view of your finances, expense tracker apps put more of an emphasis on your spending. These apps usually categorize your expenses and help you get a good idea of your purchasing behavior.	<u>8.Channels of behavior:-</u> Understanding what you spend money on and how much you spend, you can see exactly where your cash is going and areas where you can cut back.
<u>4.Emotions:-</u> If you've tried budgeting and failed miserably, using an expense tracker can solve your budget plan		

4.REQUIREMENT ANALYSIS

4.1.Functional requirements:

- i. A functional requirement defines a function of a system or its component, where a function is described as a specification of behaviour between inputs and outputs.
- ii. It specifies “what should the software system do?”

<u>S.No</u>	<u>DESCRIPTION</u>	<u>SUB REQUIREMENT</u>
<u>1.</u>	User Registration	Registration can be done in order to get the user details.
<u>2.</u>	User Category	Categorization of different expenses
<u>3.</u>	Forgot Password	Resetting the password or username by sending an OTP to user's Phone SMS.
<u>4.</u>	User Login	User Login to the dashboard through mail account or by entering username and password.
<u>5.</u>	Dashboard	User can add the expense and can evaluate them using the provided options.
<u>6.</u>	Alert User	Alerting the user by a Notification system.
<u>7.</u>	Result Page	Shows the user result of the tracked expense.
<u>8.</u>	Visual Representation	Report should be in a graphical format.

4.2.Non-Functional requirements

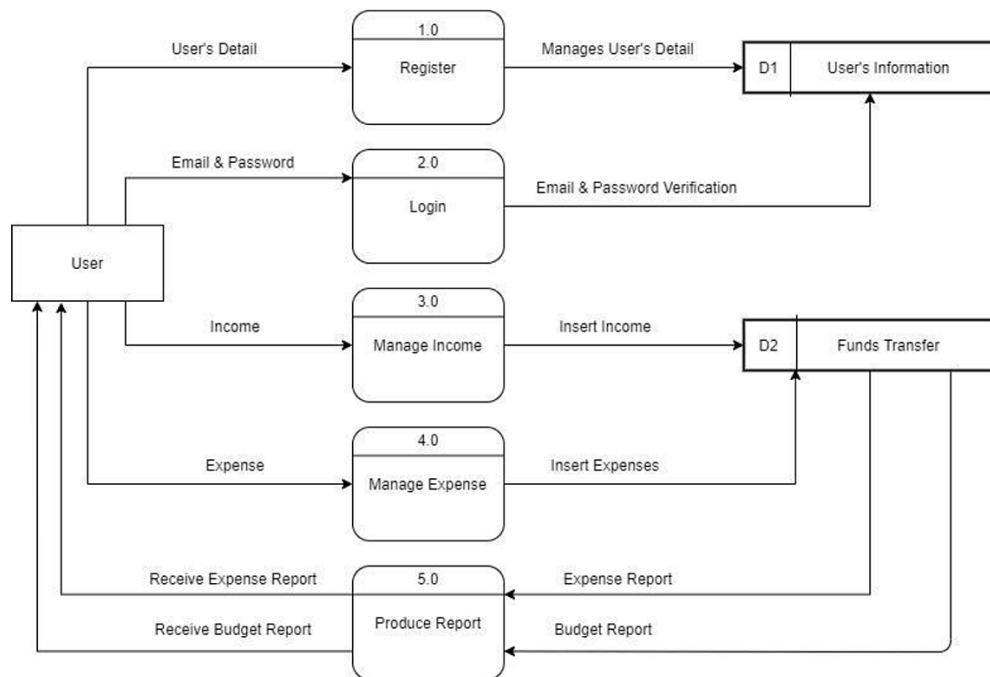
- iii. A non-functional requirement defines the quality attribute of a software system
- iv. It places constraint on “How should the software system fulfill the functional requirements?" Following are the non-functional requirements of the proposed solution.

<u>S.NO</u>	<u>NON FUNCTIONAL</u>	<u>DESCRIPTION</u>
NFR-1	Usability	Used to keep a record of how your expense got spent.
NFR-2	security	Customer data's are protected with strong password.
NFR-3	Reliability	If the customer face any problem, then they can send query messages.
NFR-4	Performance	Makes trustworthy calculations and performance consistently well.
NFR-5	Availability	Application is made available 24/7 for the user.

NFR-6	Scalability	It would work perfectly even while storing huge amount of datasets and giving multiple commands doesn't affect its performance.
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5.PROJECT DESIGN

5.1.Data flow diagram



5.2 Solution and Technical Architecture

SOLUTION ARCHITECTURE OF PERSONAL EXPENSE TRACKER:

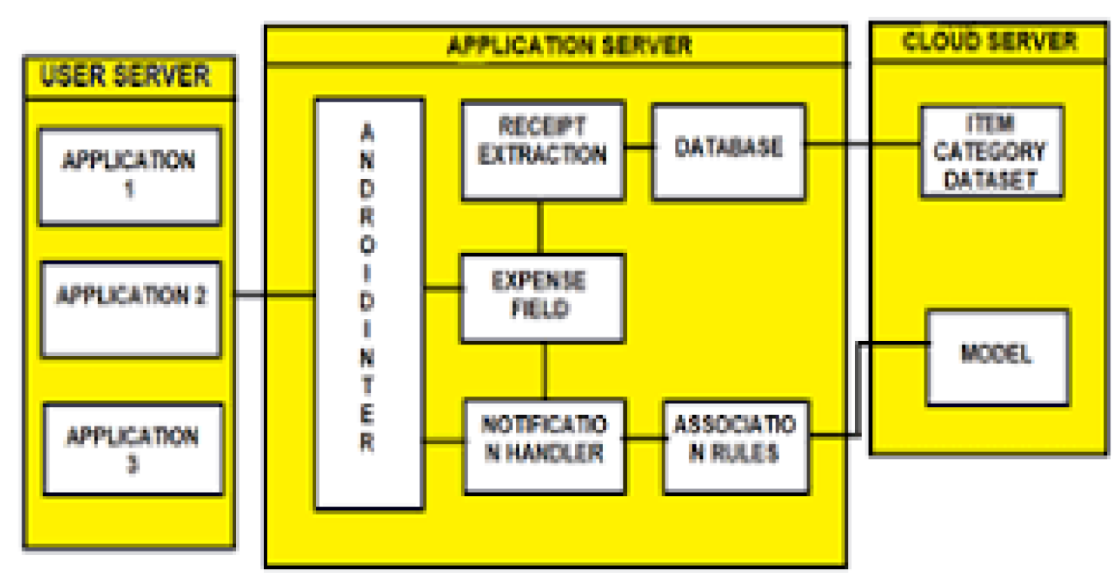
Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology.

Best tech solution to solve existing problems:

1. Categorize your expenses.
2. Make your own budget plan.
3. The 50/30/20 budget calculator.
4. Budgeting or expense-tracking apps
5. Build your budget.

1. Work and flow the plan accordingly.

Specifications according to the solution of Personal Expense Tracker:



Structure, characteristics, behaviour, and other aspects of the Personal Expense Tracker Software:

5.3. User Stories

User Type	Functional Requirement(Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can accessmy account / dashboard	High	
		USN-2	As a user,I will receive confirmation email once I have registered for the application	I can receive confirmation email and click confirm	High	

		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	
		USN-4	As a user, I can register for the application through Gmail	I can register access the dashboard with Gmail Login	Medium	
	Login	USN-5	As a user, I can log into the application by entering email& password	I can access my account / dashboard	High	
	Dashboard	USN-6	As a user, I can add income and expenditure details.	I can view my daily Expenses	High	
		USN-7	As a user, I can edit my income and expenses	I can delete, update my monthly expenses and income.	Medium	

Customer (Web user)	Report	USN-8	As a user, I get a expense report anytime I need	It shows the report	High	
	Logout	USN-9	As a user, I click on the logout button	It logout the user account	Low	
Customer care executive	Customer care	USN-10	As a customer executive, I can solve customer problem as any login issues or other.	24/7 customer care support is provided	Medium	

6.PROJECT PLANNING& SCHEDULING:

6.1.Sprint Planning & Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Login Page Template	USN-1	As a user, I can use the login page for login purpose	1	Low	S.Nivethithaa
	Signup page Template	USN -2	As a user, I can use the login page for login purpose	1	Low	M.Priyanka
	Forget Password Template	USN-3	As a user, I can use the forget password page for login purpose	1	Low	K.Sabitha
	Forget Password and verification page Template	USN-4	As a user, I can verify the password that I have changed	1	Medium	T.Keerthana
	Add income page Template	USN-5	As a user, I can view my income page	2	High	S.Nivethithaa

	Add expense Page Template	USN-6	As a user, I can add my expenses in the expense page	2	High	T.Keerthana
	Dashboard Page Template	USN-7	As a user, I can view the overall statistics of mu expense using dashboard page	1	Medium	M.Priyanka
	Add Budget Limit	USN-8	As a user, I can set the budget limit in the dashboard page	1	Low	T.Keerthana
Sprint-2	Database Model	USN-9	Creating a database model by using SQL Lite	2	High	K.Sabitha
	Setting up IBM DB2	USN-10	Creating and setting up the IBM DB2 Databases	2	High	S.Nivethithaa
	Set up IBM DB2 in flask	USN-11	Installing and setting up the necessary tools in the flask app	2	High	M.Priyanka
	Integrating IBM DB2	USN-12	Integrating IBM DB2 with python flask API	2	High	K.Sabitha
	Sending data in UI	USN-13	Sending and connecting API request response data with UI	2	High	T.Keerthana

Sprint-3	IBM Watson Assistant	USN-14	Creating IBM Watson Assistant for chatbot service to the user	2	Medium	M.Priyanka
	Setting UP SendGrid	USN-15	Creating SendGrid Account and Setting up the necessary libraries in the flask app	1	Medium	S.Nivethithaa
	Integrating SendGrid	USN-16	By Integrating SendGrid service you can to receive E-Mails with the python flask	1	Medium	T.Keerthana
	Integrating chantJS	USN-17	By Integrating chantJS in the dashboard the user can overview their expense	2	Medium	K.Sabitha
Sprint-4	Containerizing App	USN-18	Containerizing the flask application into a docker container usage	2	Medium	S.Nivethithaa
	Uploading to IBM cloud registry	USN-19	Uploading the docker container image to IBM cloud registry is useful in deployment	2	Medium	M.Priyanka
	Deploying in kubemetes	USN-20	Deploying the docker container image from the kubemetes	2	High	K.Sabitha

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Sprint	Functional Requirement (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 entering my email, password, and confirming my password.	2	High	K.Sabitha
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	T.Keerthana
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	M.Priyanka
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	S.Nivethithaa

Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	K.Sabitha
Sprint-3	Login	USN-5	As a, Customer Care Executive I can log into the application by entering server email & password	2	High	T.Keerthana
Sprint-4	Login	USN-5	As a Administrator, I can log into the application by entering sever email & password	2	High	S.Nivethithaa

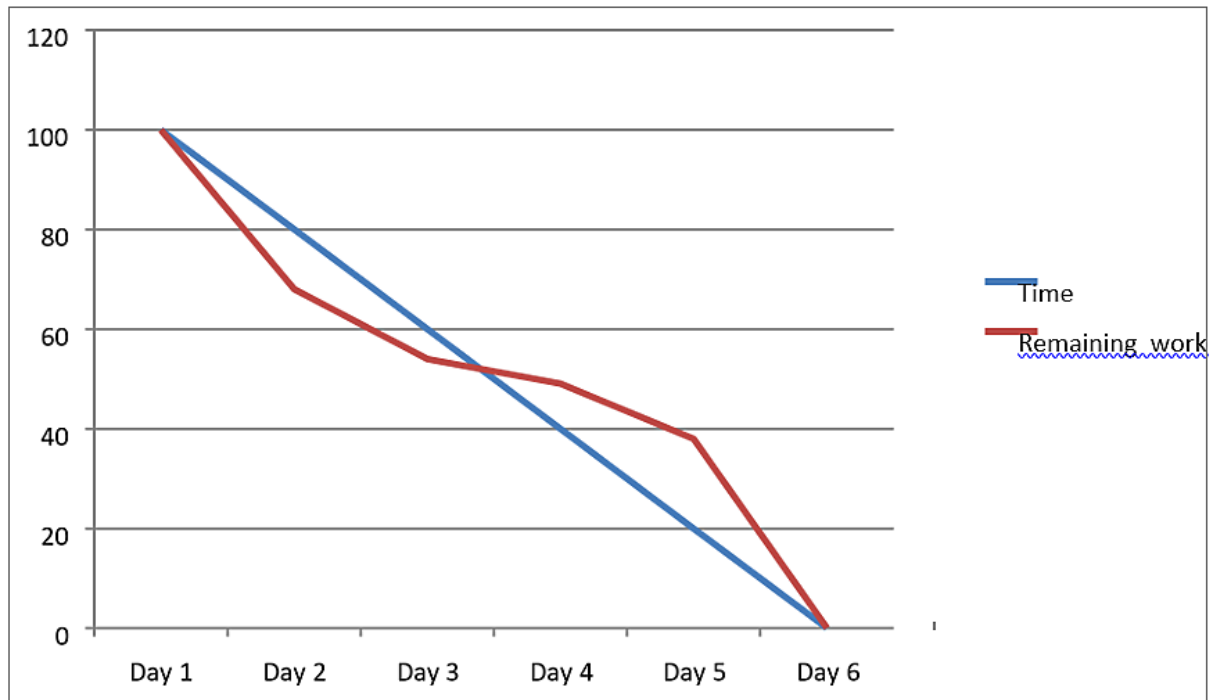
Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	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	24 Oct 2022	29 Oct 2022	20	30 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	06 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	14 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

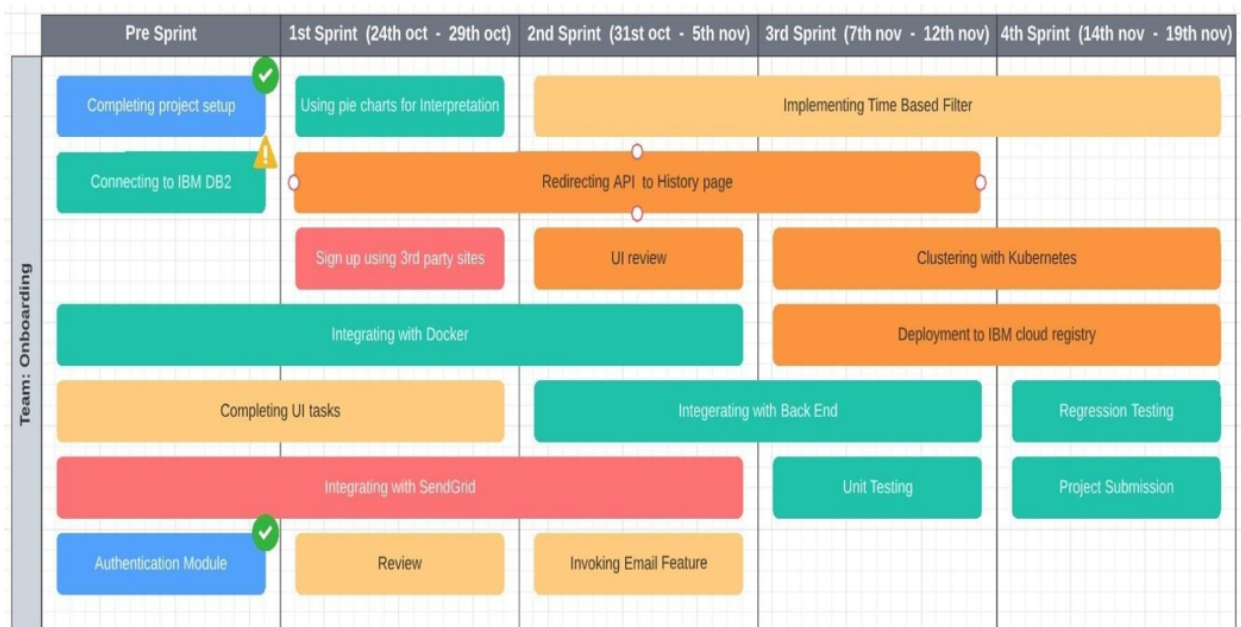
Velocity:

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

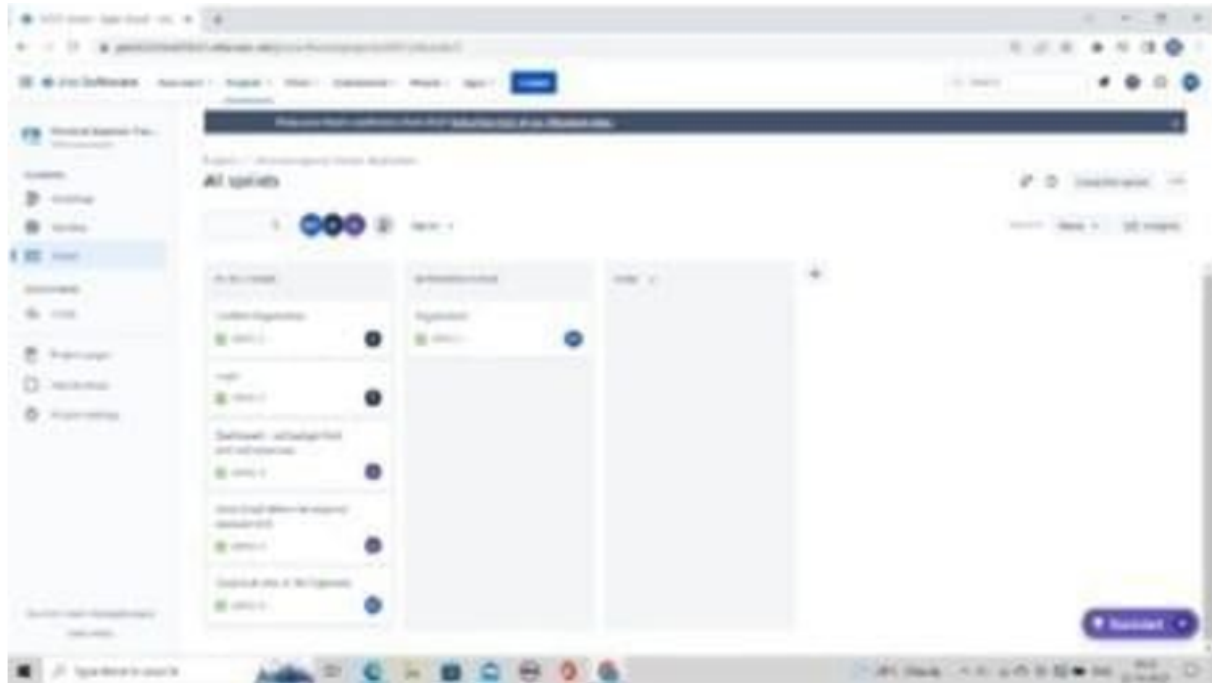
Burndown Chart:



6.2 Sprint Delivery Schedule



6.3.Reports from JIRA



7.CODING & SOLUTIONING

7.1.Feature 1

We have added the data visualization on methods for expenditure. The pie chart have been used to represent the monthly expenses.The pie chart is a pictorial representationof data that makes it possible to visualize the relationshipsbetween the parts and the whole of a variable. For example, it is possible tounderstand 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:

1. You are looking to categorize and compare a set of data.
2. You only have positive values.
3. You have less than seven categories since a larger number can make it difficult to perceive each segment.

CODE :

todayExpenses.html & app.py

```
1{% extends 'base.html' %}
2{% block body %}
3<div class="container ">
4<div class="row">
5
6      <div class="col-md-5">
7      <h3 class="mt-5">Today Expense
8      Breakdown</h3>
9
10     <div class="card shadow mb-2 bg-
11     white rounded-pill">
12     <div class="card-body ">
13     <div class="row">
14     <div class="col-md-
15     6">TIME</div>
16
17     <div class="col-md-6">
18     AMOUNT </div>
19
20     </div>
```

```
13      </div>
14      </div>
15      {% for row in texpense %}
16      <div class="card shadow mb-2
17      bg-white rounded-bottom">
18      <div class="card-body ">
19      <div class="row">
20      <div id="ttime" class="col-md-
21      6">{{row [0]}}</div>
22      <div id="tamount" class="col-
23      md-6"> {{row[1] }}
24      </div>
25      </div>
26      </div>
```

<section>

```

28      <div class="row">
29      <div class="col-md-6">
30      <h3 class="mt-5">Expense
      Breakdown BY Category</h3>
31      <div class="card shadow
      mb-
      2 bg-white rounded-bottom">
32      <div class="card-body ">
33      <div class="row">
34      <div class="col-md-
      6">Food</div>
35      <div id="tfood" class="col-
      md-6"> {{ t_food}}
      </div>
36      </div>
37      </div>
38      </div>
39 <div class="card shadow mb-2
      bg-white rounded">

```

```

40         <div class="card-body">
41             <div class="row">
42                 <div class="col-md-
6">Entertainment</div>
43                 <div id="tentertainment"
class="col-md-6">
44                     {{ t_entertainment}} </div>
45                 </div>
46             </div>
47             <div class="card shadow mb-2
bg-white rounded">
48                 <div class="card-body">
49                     <div class="row">
50                         <div class="col-md-
6">Business</div>
51                         <div id="tbusiness"
class="col-md-6">
{{t_business}}

```

```
52         </div>
53     </div>
54 </div>
55 <div class="card shadow mb-2
    bg-white rounded">
56     <div class="card-body">
57         <div class="row">
58             <div class="col-md-
    6">Rent</div>
59             <div id="trent" class="col-md-
    6"> {{ t_rent }} </div>
60         </div>
61     </div>
62 </div>
63 <div class="card shadow mb-2
    bg-white rounded">
64     <div class="card-body">
65         <div class="row">
66             <div class="col-md-
```


6">EMI</div>

67

```
<div id="temi" class="col-md-6">{{ t_EMI }} </div>
```

68

```
</div>
```

69

```
</div>
```

70

```
</div>
```

71

```
<div class="card shadow mb-2 bg-white rounded">
```

72

```
<div class="card-body">
```

73

```
<div class="row">
```

74

```
<div class="col-md-
```

6">Other</div>

75

```
<div id="tother" class="col-md-6"> {{ t_other }}</div>
```

76

```
</div>
```

77

```
</div>
```

78

```
</div>
```

79

```
<div class="card shadow mb-2 btn-outline-danger rounded-pill">
```

```

80      <div class="card-body">
81      <div class="row">
82      <div class="col-
md6">Total</div>
83      <div class="col-md-
6">₹ {{total}} </div>
84      </div>
85      </div>
86      </div>
87      </div>
88      <div class="col-md-6">
89      <canvas id="myChart"
width="400"
height="400"></canvas>
90      <script>
91      let food =
document.getElementById('tfoot
d').innerHTML
92      let entertainment =
document.getElementById('tent
ertainment'

```

).innerHTML

93

```
let business =  
document.getElementById('tbusi  
ness').innerHTML
```

94

```
let rent =  
document.getElementById('trent'  
).innerHTML
```

95

```
let emi =  
document.getElementById('temi')  
.innerHTML
```

96

```
let other =  
document.getElementById('tothe  
r').innerHTML
```

97

```
var ctx =  
document.getElementById('myCh  
art').getContext('2d');
```

98

```
var myChart = new Chart(ctx, {
```

99

```
type: 'doughnut',
```

100

```
data: {
```

```
101         labels: ['Food',
102                 'Entertainment', 'Business', 'Rent',
103                 'EMI', 'Other'],
104         datasets: [{
105             label:
106             data: [food,
107                   entertainment,
108                   business, rent, emi,
109                   other],
110             backgroundColor: [
111                 'rgb(255, 99, 132)',
112                 'rgb(0, 0, 0)',
113                 'rgb(255, 205, 86)',
114                 'rgb(201, 203,
```

```
110         'rgb(54,  
111         162, 235)',  
112  
113         'rgb(215, 159,  
114         64)'  
115     ],  
116     },  
117     responsive: true,  
118     plugins: {  
119         legend: {  
120             position: 'bottom',  
121         },  
122         title: {  
123             display: true,  
124             text: 'EXPENSE  
125             BREAKDOWN'  
126         }  
127     }  
128 }
```

```
127         });
128     </script>
129 </div>
130 </div>
131 </div>
132 </section>
133 </div>
134 {% endblock %}
```

```
1 @app.route("/today")
2 def today():
3
4     param1 = "SELECT TIME(date) as tn, amount FROM expenses
5     WHERE userid = " + str(session['id']) + " AND DATE(date) =
6     DATE(current timestamp) ORDER BY date DESC"
7     res1 = ibm_db.exec_immediate(ibm_db_conn, param1)
8     dictionary1 = ibm_db.fetch_assoc(res1)
9     texpanse = []
10
11     while dictionary1 != False:
12         temp = []
13         temp.append(dictionary1["TN"])
```

```

12 temp.append(dictionary1["AMOUNT"])
13 texpense.append(temp)
14 print(temp)
15 dictionary1 = ibm_db.fetch_assoc(res1) 16
17 param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " AND
    DATE(date) = DATE(current timestamp) ORDER BY date DESC"
18 res = ibm_db.exec_immediate(ibm_db_conn, param)
19 dictionary = ibm_db.fetch_assoc(res)
20 expense = []
21 while dictionary != False:
22     temp = []
23     temp.append(dictionary["ID"])
24     temp.append(dictionary["USERID"])
25     temp.append(dictionary["DATE"])
26     temp.append(dictionary["EXPENSENAME"])
27     temp.append(dictionary["AMOUNT"])
28     temp.append(dictionary["PAYMODE"])
29     temp.append(dictionary["CATEGORY"])
30     expense.append(temp)
31     print(temp)
32     dictionary = ibm_db.fetch_assoc(res) 33
34 total=0
35 t_food=0
36 t_entertainment=0
37 t_business=0
38 t_rent=0
39 t_EM=0
40 t_other=0
41

```

```

42     for x in expense:
43         total += x[4]
44         if x[6] == "food":
45             t_food += x[4]
46         elif x[6] == "entertainment":
47             t_entertainment += x[4]
48         elif x[6] == "business":
49             t_business += x[4]
50         elif x[6] == "rent":
51             t_rent += x[4]
52         elif x[6] == "EMI":
53             t_EMI += x[4]
54         elif x[6] == "other":
55             t_other += x[4]
56     print(total)
57     print(t_food)
58     print(t_entertainment)
59     print(t_business)
60     print(t_rent)
61     print(t_EMI)
62     print(t_other)
63
64
65     return render_template("today.html", texpanse = texpanse,
66         expense = expense, total = total ,
67         t_food = t_food,t_entertainment =
68         t_entertainment,
69         t_business = t_business, t_rent =
70         t_rent,
71         t_EMI = t_EMI, t_other = t_other )

```

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 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-of-stock 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.

sendemail.py

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

def sendmail(TEXT, email):
    from_email = Email("tour7107@gmail.com")
    to_email = To(email)
    subject = "Sending with SendGrid is Fun"
    content = Content("text/plain", TEXT)
```

a. Database Schema

Tables :

Admin

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

password VARCHAR(32) NOT NULL

1. 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

1. LIMIT

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

1. TESTING

a. Test Cases

Test Case ID	Purpose	TestCases	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 minimum 2 characters	User name accepted

a. User Acceptance Testing

Technical Requirement 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.PerformanceMetrics

- i. Tracking income and expenses: Monitoring the income and tracking all expenditures (throughbank accounts, mobilewallets, 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 expensetracking 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 tracking app sends reminders for payments and 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. E-commerce integration: Integrate your expense tracking app with 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 your business.
- xii. Recurrent Expenses: Rely on your budgeting app to track, streamline, and automate all the recurrent expenses and remind you on a timely basis.

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 as push notifications.
6. **Boost the productivity** of all the processes within the organization.
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.

12FUTURE

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.

1. APPENDIX

Source Code Github Link :

<https://github.com/IBM-EPBL/IBM-Project-41944-1660646409>