

RAJALAKSHMI ENGINEERING COLLEGE, CHENNAI

Department of Information Technology

TITLE: PERSONAL EXPENSE TRACKER APPLICATION

TECHNOLOGY: CLOUD APPLICATION DEVELOPMENT

LEADER NAME: VISHNU KUMAR V K

TEAM MEMBERS: VIJAY SARATHI K N, VIGNESH BOOPATHY, SENTHIL NATHAN U

TEAM ID: PNT2022TMID02662

TABLE OF CONTENT

1 INTRODUCTION

1.1 Project Overview

1.2 Purpose

2 LITERATURE SURVEY

2.1 Existing System

2.2 References

2.3 Problem Statement Definition

3 IDEATION & PROPOSED SYSTEM

3.1 Empathy Map Canvas

3.2 Ideation & Brainstorming

3.3 Proposed Solution

3.4 Problem Solution fit

4 REQUIREMENT ANALYSIS

4.1 Functional requirement

4.2 Non-Functional requirements

5 PROJECT DESIGN

5.1 Data Flow Diagrams

5.2 Solution & Technical

Architecture

5.3 User Stories

6 PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

6.2 Sprint Delivery Schedule

6.3 Reports from JIRA

7 CODING & SOLUTIONING

7.1 Feature 1

7.2 Feature 2

7.3 Database Schema (if Applicable)

8 TESTING

8.1 Test Cases

8.2 User Acceptance Testing

9 RESULTS

9.1 Performance Metrics

10 ADVANTAGES & DISADVANTAGES

11 CONCLUSION

12 FUTURE SCOPE

13 APPENDIX

13.1 Source Code

13.2 Project Demo

1 Introduction

The expense tracker application serves the important purpose of managing finances which is very important. Whether you're working on creating a budget or you are trying to simplify the bookkeeping for a small business, tracking your expenses should be a first step. If most of your spending is done electronically (using a debit card or a credit card), you may be able to get away with just tracking your cash spending. Most money management software can automatically import those electronic expenses, further simplifying matters. We can also choose to use your own system, from the ground up, including setting up a spreadsheet and entering information by hand. When it comes to tracking expenses, you can make your system as simple as collecting receipts and organising them once a month. You might get a little more information from other expense tracking systems (listing them in a spreadsheet, using money management software or even choosing an online application), but all methods have one thing in common: you have to get in the habit of thinking about your expenses. It's very easy to misplace a receipt or forget about any cash you spent. You may even think that a cup of coffee or a trip to the vending machine isn't worth tracking — although those little expenses can add up amazingly fast. There are all sorts of opportunities to throw a kink into your plan to track expenses. You have to get in the habit of doing so, to reduce those lapses, and make sure that the data you're basing financial decisions on is solid. The application has a screen that allows the user to add his day to day spendings and at the end of each day the user can see how much money has been spent. At the end of each week the user can see an analysis of what the maximum amount of money is spent. The aim of this project is to provide a solution for users on how to manage finances in any circumstances by keeping track of the expenses daily

1.1 Project Overview

In this digitised world we tend to spend more money than the required amount as it becomes difficult to keep track of the amount that is being amount since no physical cash is involved. A personal expense tracker can not only help you with tracking of your expenses but also helpful insights about money management. It will ask the user to add the expenses and based on it the wallet will be updated. They can also set a limit to how much money can be spent within a month and can be notified if they exceed the limit.

1.2 Purpose

The main objective and purpose of the project is to:

- To keep track of personal expense
- Visualise the data in the graph
- Sending an email to the user about his/her expense
- Track the weekly expense in the form of graph

2.1 Existing problem:

To manage our personal we keep tab on ourselves by using pen and paper to note our expenses. This is manageable when we want to manage our expenses for a small period of time. Otherwise the data will be stored in a excel sheet or other spreadsheets in a local system. The main problem with this is that the user cannot add the data whenever he wants and cannot be accessed in other devices. This issue can be solved by developing a web app to track the users expenses to store and modify the data whenever he wants.

2.2 REFERENCE:

1. Expense Tracker (2020) Prof Miriam Thomas, Lekshmi P , and Dr. Mahalekshmi T.
2. Gupta, H., Singh, A. P., Kumar, N., & Blessy, J. A. (2020). Expense Tracker: A Smart Approach to Track Everyday Expense (No. 4809). EasyChair.
3. Chandini, S., Poojitha, T., Ranjith, D., Akram, V. M., Vani, M. S., & Rajyalakshmi, V. (2019). Online Income and Expense Tracker. International Research Journal of Engineering and Technology (IRJET), 6(3), 2395-0056.
4. Thanapal, P., Patel, M. Y., Raj, T. L., & Kumar, J. S. (2015). Income and expense tracker. Indian Journal of Science and Technology, 8(S2), 118-122

The author describes [1] a web application to manage the daily expenses in a more efficient and manageable way. The user provides his/her income to calculate his/her total expenses per day and these results will be stored for each user. The application has the provision to predict the income and expense for the manager using data mining. g. In this application, there are 3 logins such as admin, manager and staff. Admin has the privilege to add, edit, delete manager, add, edit, delete staff, and to get all custom reports. For managers, the privileges are to add type of expense, verify expense, add type of income, verify income and generate reports. For staff, the privileges are to add and edit expense, income and calculations, and send for verifications.

The author describes [2] an expense tracker to prevent calculating income and expenses, as well as to remind someone to keep their expenses in track and also to add some details on how much money comes from other people and what expenses the user has to make on a given date or month. Users have categories in the expenditure tracker such as add expense, monthly expenses, add new expense, see categories of spending, export expenses in a date range, remove export files, and view expenses by category.

The author describes [3] that will maintain all the expenses records of users and manage them efficiently. The user can choose an expense category and provide additional information such as a photo, a location, and the amount of the expense, among other things. That will save the information to the local database. The user can examine and sort expenses on a weekly, monthly, or annual basis. The user can enter his income to compute his total daily expenses, and the data will be saved for each individual user. The tracker will make it easier for them to disburse the bill and also show the graph in the chosen view.

The author describes [4] an expense tracker to create a system for recording expenses and income that is simple, quick, and easy to use. Most people are unable to track their expenses and income, resulting in financial difficulties. In this scenario, a daily cost tracker can assist people in tracking their income and expenses on a daily basis, allowing them to live a stress-free life.

2.3 Problem statement

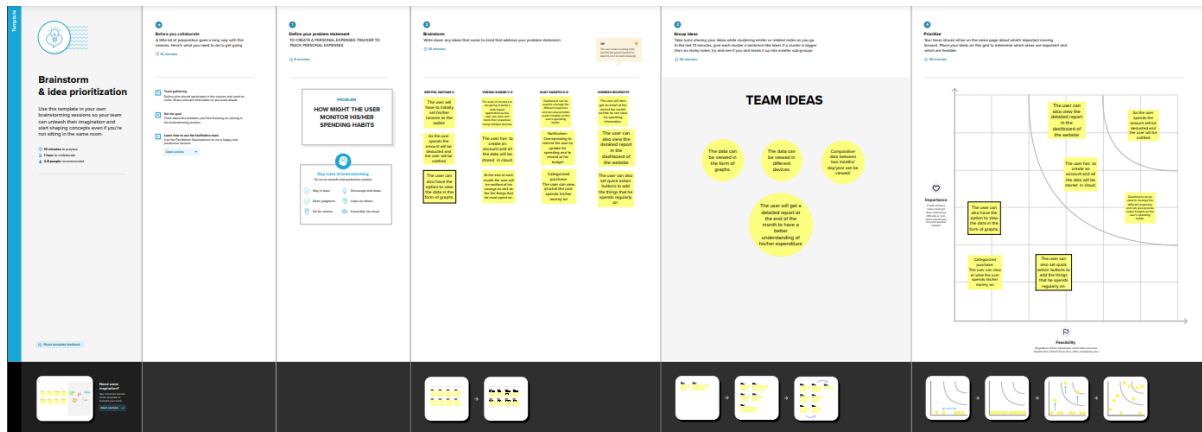
To create web application to monitor and track one's personal expense. People today are Not conscious about how much they spend everyday. They don't keep track on their expenses. Failing to teach this valuable knowledge had left many Indians to recklessly spend their income and fall into vicious cycles of EMI and debt. Many of them are just a month's salary away from bankruptcy. This issue is tackled by providing a web application for where people can plan their monthly expenses into categories, set alerts and get visual insights from their spending patterns. Who does the problem affect Young adults and earning middle class citizens? What is the issue? Lack of financial literacy among people When does the issue occur Primarily when the person moves from college to job and starts earning their own money. Where is the issue occurring Especially among young engineers who are newly exposed to consumer centric market and services.

3 Ideation and proposed solution

3.1 Empathy map canvas



3.2 Ideation and brainstorming



3.3 Propose Solution

Problem Statement Building a personal finance tracking application that will imbibe good spending habits into students.(Problem to be solved)Idea / Solution description To build a web application that is deployed in IBM cloud and leverage mailing service like send grid to implement the same Novelty / Uniqueness The stats generated with visual graphs are more effective than log books. It also helps in using technology to gain better insights from Social Impact / Customer Satisfaction Better financial knowledge is gained. Gamified approach can be used to give self satisfaction.Reduced chances of bad debt in future Business Model (Revenue Model) Subscription can be incorporated to access premium tools within the app. Scalability of the Solution as deployment.As the application is containerized for It can be easily scaled in a cloud service provider like IBM.

3.4 Problem solution fit

Define CS, fit into CC	1. CUSTOMER SEGMENTS CS <ol style="list-style-type: none"> 1) Small scale companies to make the process of budget in an easier way. 2) Used by lenders to keep their account in precise manner 3) For a common man to keep track of his everyday expenses 	6. CUSTOMER CONSTRAINTS — <ol style="list-style-type: none"> 1) There are chances of discrepancy between the actual budget and the practical budget. 2) Due to many scam websites among the network customer may have the question on the reliability. 	5. AVAILABLE SOLUTIONS — <ol style="list-style-type: none"> 1) Evaluation of the budget 2) Faster calculation of expense to the customers. 3) Email is alert is sent to the necessary times. 	Explore AS, differentiate

3. TRIGGERS Tr <ol style="list-style-type: none"> 1) Lack of budgeting knowledge. 2) Inadequate input. 	10. YOUR SOLUTION SL <p>Personal Expense tracker Application falls in the Finance Category and serves the important purpose of managing finances which is a very important part of one's life. The main purpose of this application is</p> <ul style="list-style-type: none"> ❖ Maintain computerized diary ❖ Track of expenses of a user on a day-to-day basis. ❖ Categorize distribution of the expenses ❖ Highlight where the user spends most of their money. ❖ To keep the user conscious of his/her spending. 	8. CHANNELS of BEHAVIOUR CH <ul style="list-style-type: none"> ❖ Provide the details of day-to-day expenses ❖ Select the area where consumer use ❖ Upload the expenses for budgeting
4. EMOTIONS: BEFORE / AFTER EM <ol style="list-style-type: none"> 1) The user will have more trust because we provide good user friendly environment 2) There will not be any frustration any more since the process is quick and flexible. 3) As time is very much saved, people will find this application as boon for budgeting. 		

4 Requirement Analysis

4.1 Functional requirement

Following are the functional requirements of the proposed solution.

Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
User Registration	Registration through Email/SignUp Registration through Gmail
User Confirmation	Confirmation via Email Confirmation via OTP
Add expenses	Enter the everyday expenses Split it into categories(example : food, petrol,movies)
Reminder mail	Sending reminder mail on target (for ex : if user wants a reminder when his/her balance reaches some amount(5000)) Sending reminder mail to the user if he/she has not filled that day's expenses.
Creating Graphs	Graphs showing everyday and weekly expenses. Categorical graphs on expenditure.

4.2 Non-Functional requirements

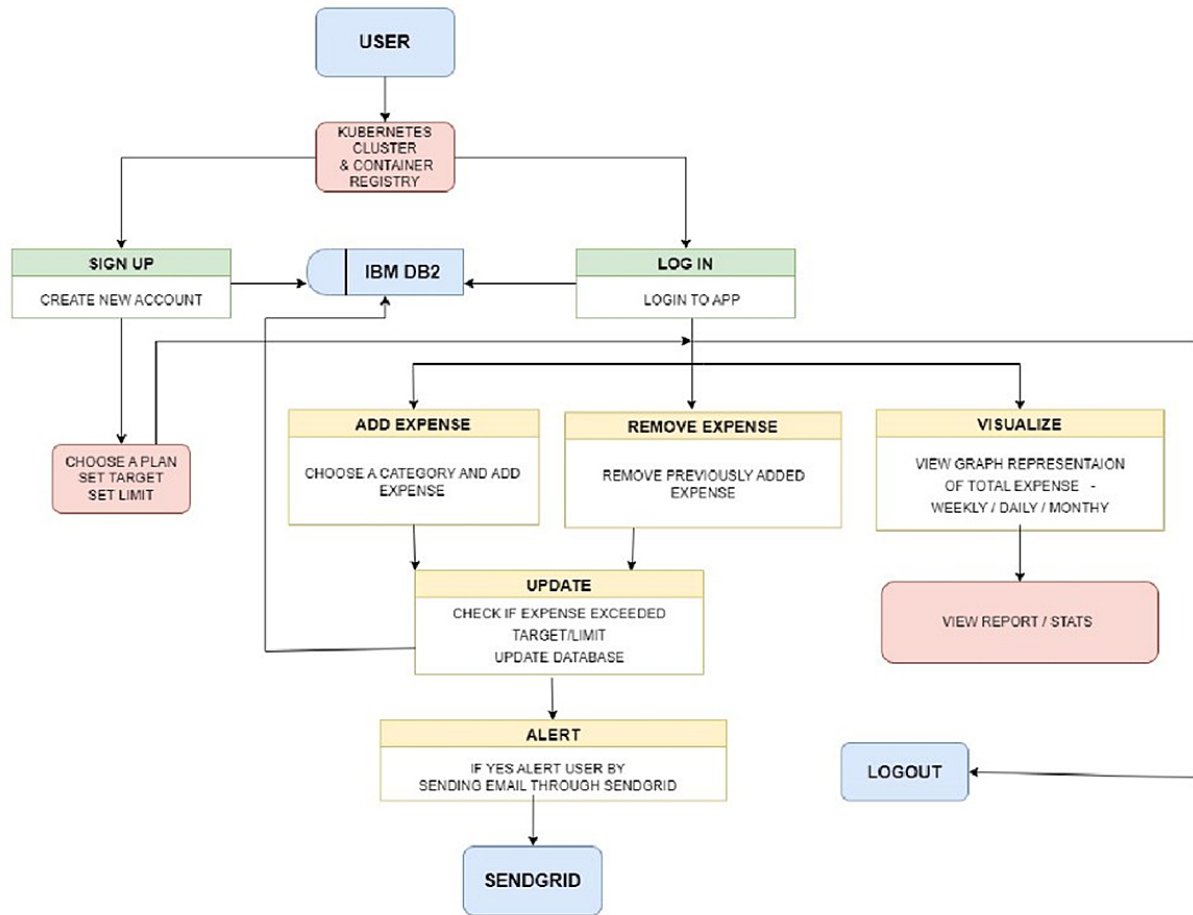
Following are the non-functional requirements of the proposed solution.

Non-Functional Requirement	Description
Usability	A simple web application which is accessible across devices
Security	The OAuth Google sign in and email login are secure with hashed and salted secure storage of credentials.
Reliability	Containerized service ensures that new instance can kick up when there is a failure
Performance	The load is managed through the load balancer used with docker. Thus ensuring good performance

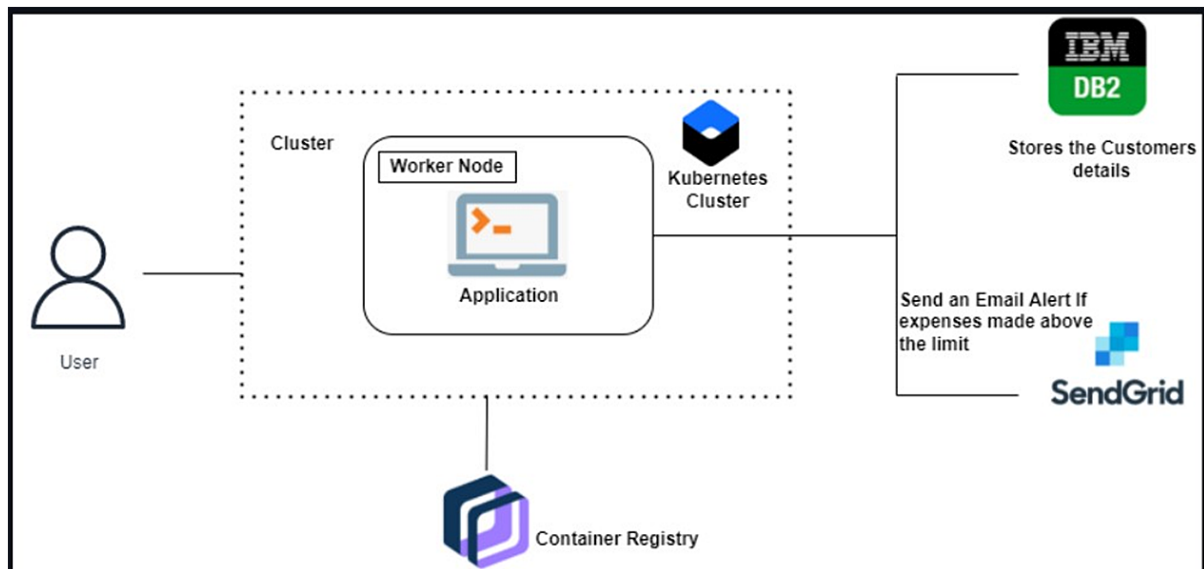
Availability	With load balancing and multiple container instances, the service is always available.
Scalability	Docker and Kubernetes are designed to accommodate scaling based on need

5 Project Design

5.1 Data flow diagram



5.2 Solution and technical architecture :



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 access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Social media accounts	I can register & access the dashboard with Social media Login	Low	Sprint-2
	Login	USN-4	As a user, I can log into the application by entering email & password	I can access my account / dashboard	High	Sprint-1
	Dashboard	USN-5	Once logged in , based on user's expenses and data records , graphical representation is achieved	I can view my updated dashboard	High	Sprint-2
	Financial account	USN-6	As a user, I can add and remove any financial accounts	I can manage financial accounts	High	Sprint-2
	Notifications	USN-7	As a user, I can receive alerting notifications on untracked expenses	Untracked expenses are alerted	High	Sprint-3
		USN-8	As a user, I can receive suggesting notifications for saving and earning money	Suggestions are notified	Low	Sprint-3
	Security	USN-9	As a user, I am assured for linking my financial accounts securely	Security is assured	High	Sprint-4
Customer Care Executive	Customer care	USN-10	As a user, I can access the customer care for any queries and issues regarding the applications	24/7 customer care support is provided	Low	Sprint-4

6. Project Planning And Scheduling:

6.1 Sprint Planning and Estimation:

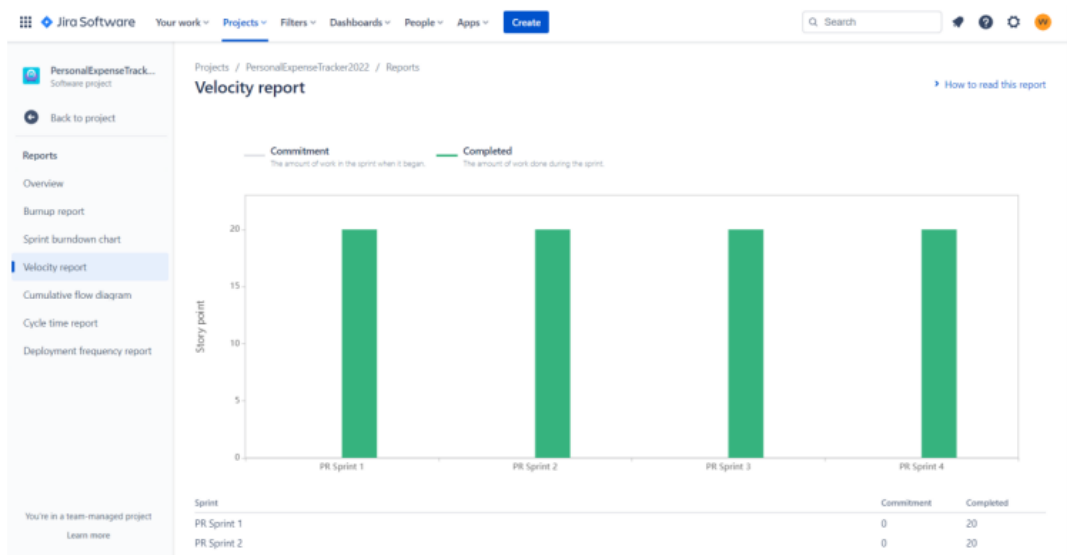
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 3		USN-1	Wrapping up the server side works of frontend	1	Medium	Senthil Nathan U
	Watson Assistant	USN-2	Creating Chat-bot for expense tracking and for clarifying user's query	2	High	Vishnu Kumar V K
	Send Grid	USN-3	Using Send Grid to send mail to the users about their expenses	1	Low	Vishnu Kumar V K & Vijay Sarathi KN
		USN-4	Integrating both frontend and backend	2	High	Vignesh Boopathy & Vijay Sarathi K N
BUG FIXES AND ROUTINE CHECKS						
Sprint-4	Docker	USN-1	Creating image of website using Docker	2	High	Vignesh Boopathy
	Cloud Registry	USN-2	Uploading docker image to IBM Cloud registry	2	High	Vishnu Kumar V K
	Kubernetes	USN-3	Create container using the docker image and hosting the site	2	High	Senthil Nathan U
	Exposing	USN-4	Exposing IP/Ports for the site	2	High	Vijay Sarathi KN

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 3		USN-1	Wrapping up the server side works of frontend	1	Medium	Senthil Nathan U
	Watson Assistant	USN-2	Creating Chat-bot for expense tracking and for clarifying user's query	2	High	Vishnu Kumar V K
	Send Grid	USN-3	Using Send Grid to send mail to the users about their expenses	1	Low	Vishnu Kumar V K & Vijay Sarathi KN
		USN-4	Integrating both frontend and backend	2	High	Vignesh Boopathy & Vijay Sarathi K N
BUG FIXES AND ROUTINE CHECKS						
Sprint-4	Docker	USN-1	Creating image of website using Docker	2	High	Vignesh Boopathy
	Cloud Registry	USN-2	Uploading docker image to IBM Cloud registry	2	High	Vishnu Kumar V K
	Kubernetes	USN-3	Create container using the docker image and hosting the site	2	High	Senthil Nathan U
	Exposing	USN-4	Exposing IP/Ports for the site	2	High	Vijay Sarathi KN

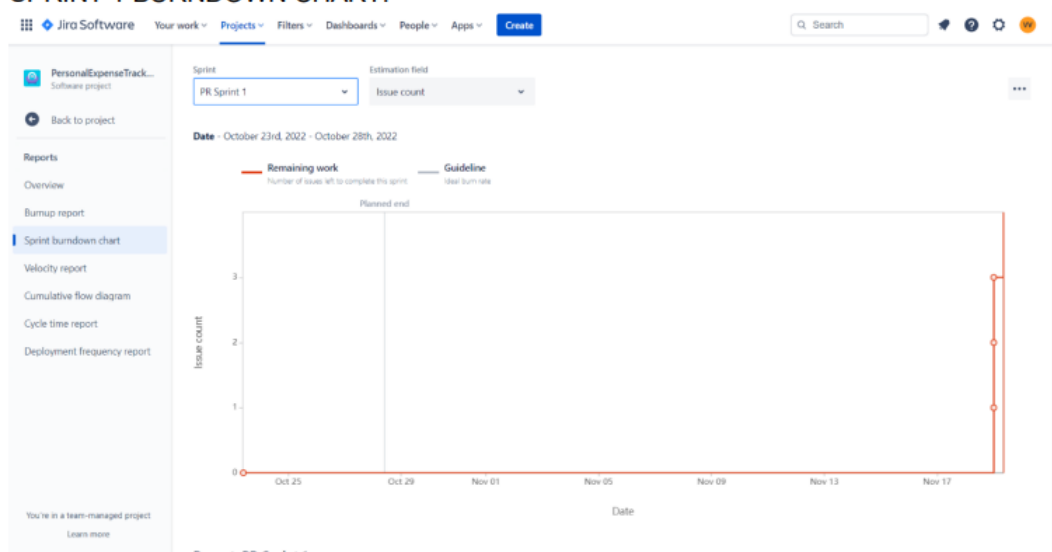
6.2 Sprint Delivery Schedule

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	9	6 Days	24 Oct 2022	29 Oct 2022	9	29 Oct 2022
Sprint-2	9	6 Days	31 Oct 2022	05 Nov 2022	9	05 Nov 2022
Sprint-3	8	6 Days	07 Nov 2022	12 Nov 2022	8	12 Nov 2022
Sprint-4	6	6 Days	14 Nov 2022	19 Nov 2022	6	19 Nov 2022

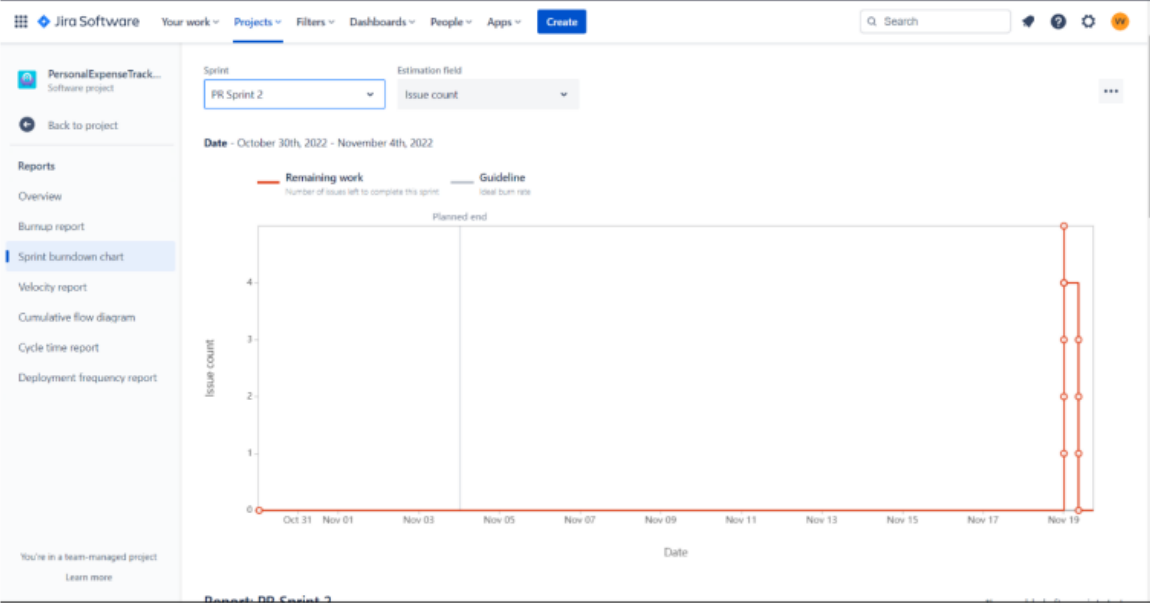
6.3 Report From Jira



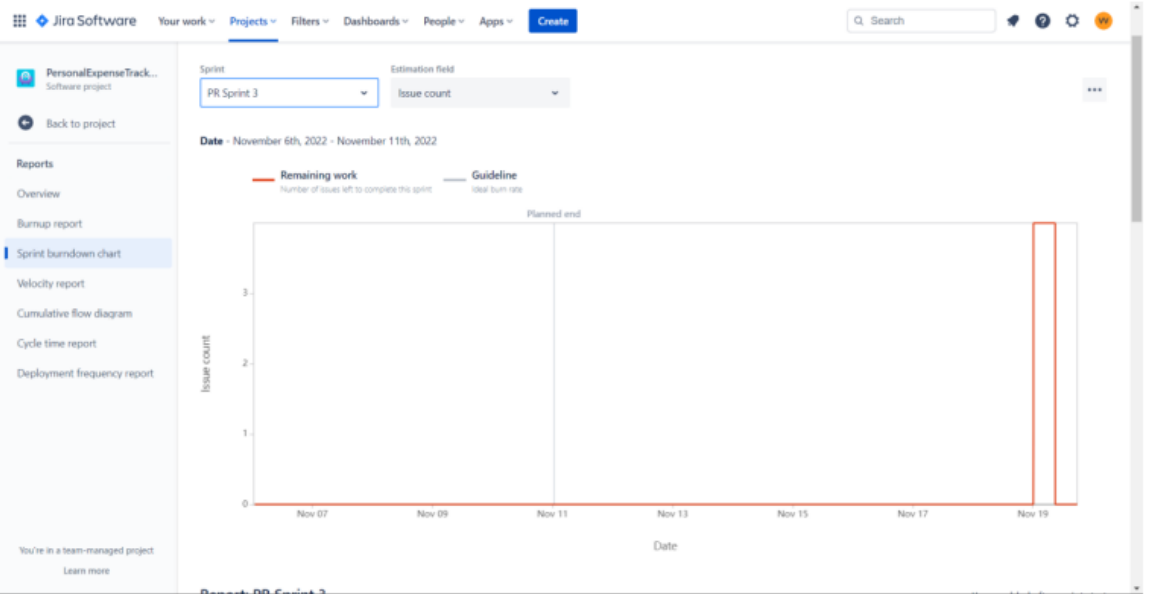
SPRINT 1 BURNDOWN CHART:



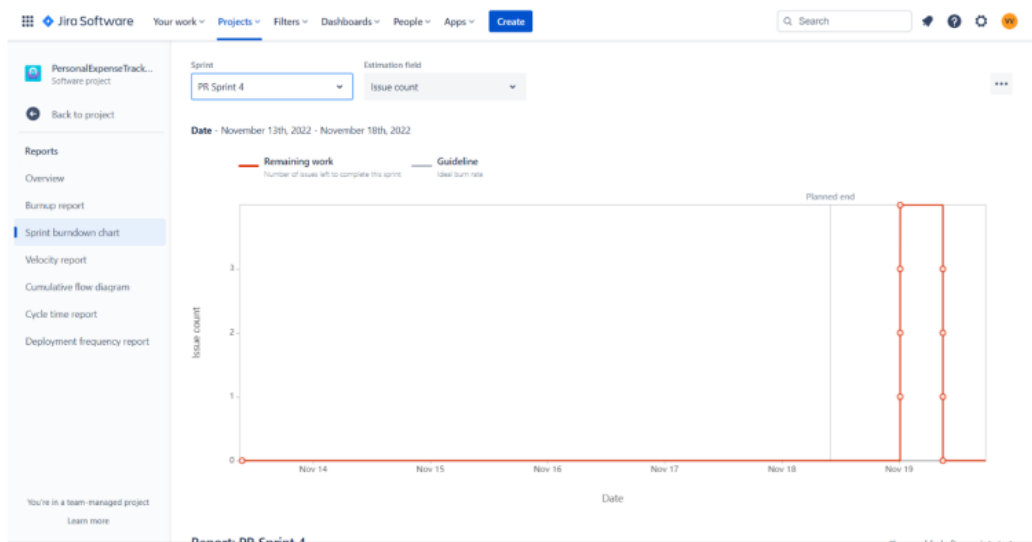
SPRINT 2 BURNDOWN CHART:



SPRINT 3 BURNDOWN CHART:



SPRINT 4 BURNDOWN CHART:



7.Coding And Solution:

7.1 Features:

Feature 1: Login

Feature 2: Add expense

Feature 3: View Summary

Feature 4: Send Alert Emails to users

7.2 Other Features

Track your expenses anywhere, anytime. Seamlessly manage your money and budget without any financial paperwork. Just click and submit your invoices and expenditures. Access, submit, and approve invoices irrespective of time and location. Avoid data loss by scanning your tickets and bills and saving in the app. Approval of bills and expenditures in realtime and get notified instantly. Quick settlement of claims and reduced human errors with an automated and streamlined billing process.

8. Testing:

8.1. TESTING:

1. Login Page (Funcional)
2. Login Page (UI)
3. Add Expense Page (Functional)

8.2. User Acceptance Testing:

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

2. 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

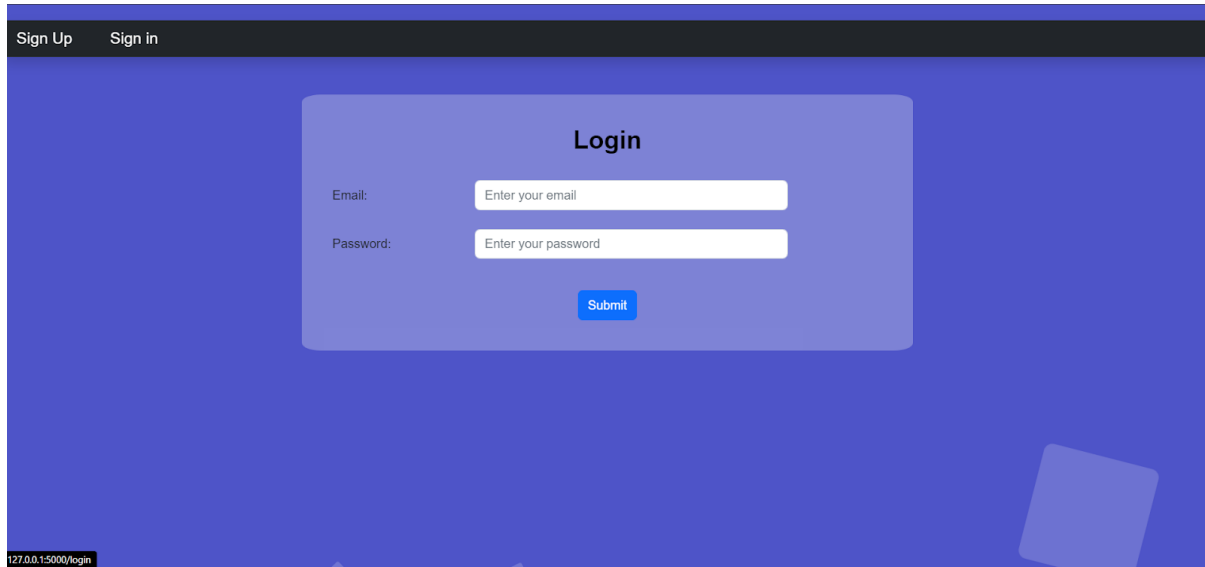
3. Test Case Analysis

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	43	0	0	43
Logout	2	0	0	2

9. Results:

9.1 Login Page:



The screenshot shows a web application with a dark blue header containing 'Sign Up' and 'Sign in' links. The main area has a blue background with a central white 'Login' form. The form includes fields for 'Email' and 'Password', each with a placeholder text 'Enter your email' and 'Enter your password' respectively. A blue 'Submit' button is located below the password field. In the bottom left corner, a small black box displays the text '127.0.0.1:5000/login'.

Sign Up Sign in

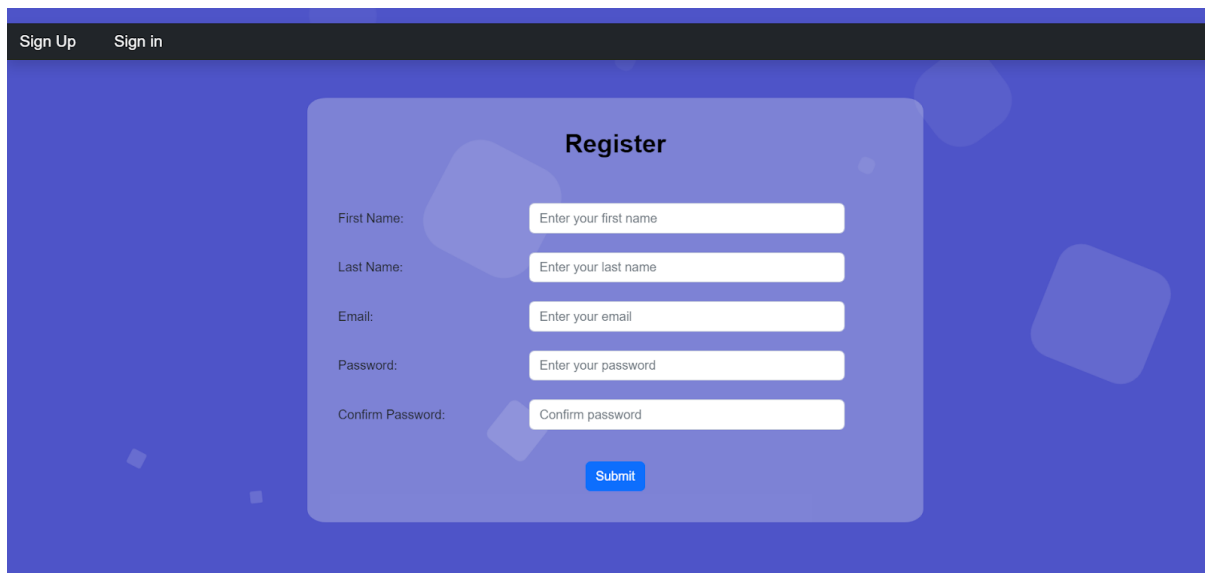
Login

Email:

Password:

127.0.0.1:5000/login

9.2 Register Page:



The screenshot shows a web application with a dark blue header containing 'Sign Up' and 'Sign in' links. The main area has a blue background with a central white 'Register' form. The form includes fields for 'First Name', 'Last Name', 'Email', 'Password', and 'Confirm Password', each with a placeholder text 'Enter your first name', 'Enter your last name', 'Enter your email', 'Enter your password', and 'Confirm password' respectively. A blue 'Submit' button is located below the 'Confirm Password' field.

Sign Up Sign in

Register

First Name:

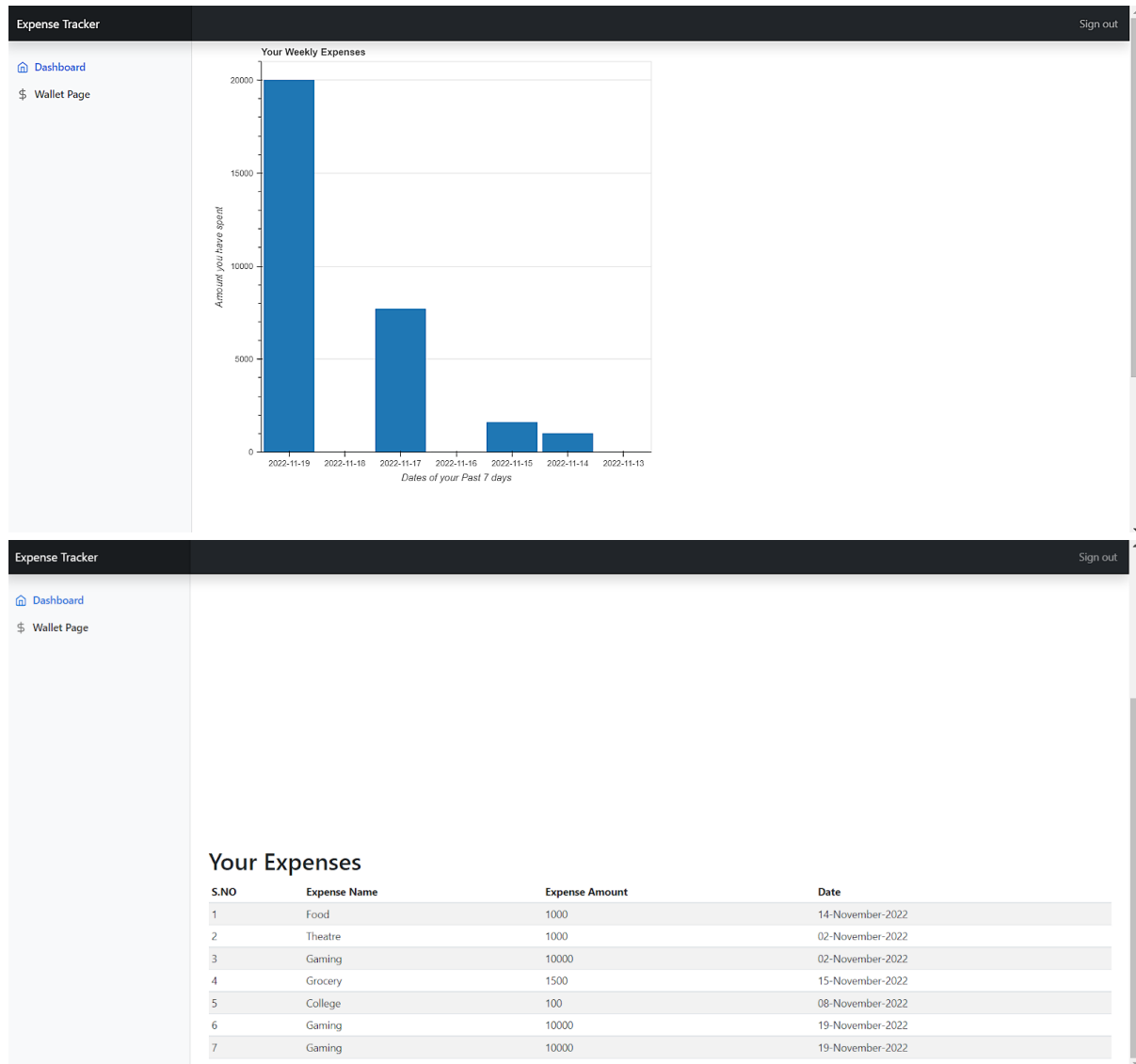
Last Name:

Email:

Password:

Confirm Password:

9.3 Dashboard:



Expense Tracker

Sign out

Dashboard

Wallet Page

Your Expenses

S.NO	Expense Name	Expense Amount	Date
1	Food	1000	14-November-2022
2	Theatre	1000	02-November-2022
3	Gaming	10000	02-November-2022
4	Grocery	1500	15-November-2022
5	College	100	08-November-2022
6	Gaming	10000	19-November-2022
7	Gaming	10000	19-November-2022

9.4 WALLET PAGE:

Dashboard

Sign out

Fill your daily expense and minimize your unwanted expenses.

Daily Expense

Expense Name:

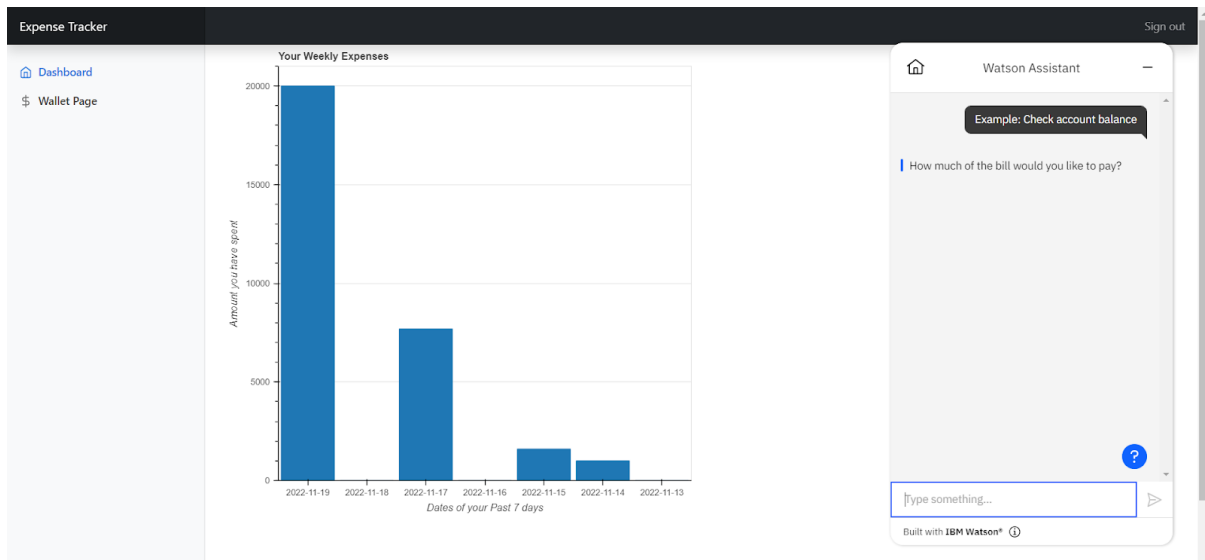
Expense Amount:

DATE:

Add Expense

₹

9.5 Watson Assistant:



10. Advantages and Disadvantages

10.1 Advantages

Keeping accurate records of personal expenses is very important for many reasons,

- Create a monthly budget
- Know where you're spending more than you actually think you are
- Figure out ways to cut back on your spending
- Know how much extra payments you can make towards your debt
- Plan for future large purchases
- Create a savings plan for putting money away every month
- Plan for retirement
- Create an investment strategy with extra money

In short, knowing where each dollar is going to go before you spend it will help it spend more time in your bank account.

10.2 DISADVANTAGES:

A con with any system used to track spending is that one may start doing it then taper off until it's forgotten about all together. Yet, this is a risk for any new goal such as trying to lose weight or quit smoking. If a person first makes a budget plan, then places money in savings before spending any new pay period or month, the tracking goal can help. In this way, tracking spending and making sure all receipts are accounted for only needs to be done once or twice a month. Even with constant tracking of one's spending habits, there is no guarantee that financial goals will be met. Although this can be considered to be a con of tracking spending, it could be changed into a pro if one makes up his or her mind to keep trying to properly manage all finances. Another con that may occur when spending is being tracked is an error, but this may also be able to be changed into a pro if the person does regular tracking. Frequent tracking of cash spending can allow one to catch and correct errors so that the budget plan is still able to be adhered to despite the mistake.

11.Conclusion:

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 savings efficiently. It helps you track all transactions like bills, refunds, payrolls, receipts, taxes, etc., on a daily, weekly, and monthly basis.

12. Future Scope:

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. Robo Advisors: Get expert investment advice and solutions with the Robo-advisors
12. This feature will analyse, monitor, optimize, and improve diversification in investments by turning data into actionable insights in real-time. Chats: Equip your expense tracking app with a bot that can understand and answer all user queries and address their needs such as account balance, credit score, etc.
13. Prediction: With the help of AI, your mobile app can predict your next purchase, according to your spending behaviour. Moreover, it can recommend products and provide unique insights on saving money. It brings out the factors causing fluctuations in your expenses.

14. Employee Travel Budgeting: Most businesses save money with a travel budgeting app as It helps prepare a budget for an employee's entire business trip. The feature will predict the expenses and allocate resources according to the prediction.

13. Appendix:

Code:

The Code was in the following github: <https://github.com/IBM-EPBL/IBM-Project-19694-1659704367>

Demo link :

https://drive.google.com/drive/folders/10LCIW2UqpfiP7nUHh4iz2VoRKACjnRO_?usp=share_link