

PERSONAL EXPENSE TRACKER

PROJECT REPORT

Submitted by

LAVANYA S - 1931027
RAHINI R - 1931040
KARTHIKA A - 2031T301
SASIPRAKASH P S - 1931045

in partial fulfillment of the requirements for the award of the degree

of

BACHELOR OF ENGINEERING

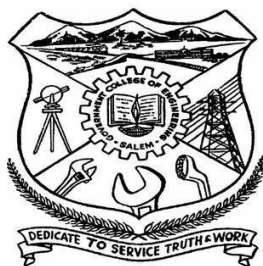
in

ELECTRONICS AND COMMUNICATION ENGINEERING

GOVERNMENT COLLEGE OF ENGINEERING

SALEM

(An Autonomous Institution)



ANNA UNIVERSITY, CHENNAI

MAY 2022

TABLE OF CONTENTS

CHAPTER NO	TITLE
1	INTRODUCTION 1.1 Project Overview 1.2 Purpose
2	LITERATURE SURVEY 2.1 Existing problems 2.2 References 2.3 Problem Statement Definition
3	IDEATION & PROPOSED SOLUTION 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

CHAPTER NO	TITLE
7	CODING & SOLUTIONING 7.1 Feature 1 7.2 Feature 2
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

1.Introduction

In today's busy and expensive lives we are in a great rush to make money. But at the end of the day we broke off. As we are unknowingly spending money on little and unwanted things. So, we have come over with the idea to track our earnings. Daily Expense Tracker (DET) aims to help everyone who are planning to know their expenses and save from it. DTE is a website in which user can add expenses on daily basis and its table will get generated and at the end based on user expenses report will be generated. User can select date range to calculate his/her expenses come over with the idea to track our earnings. PersonalExpense Tracker aims to help everyone who are planning to know their expenses and save from it. Personal Expense Tracker is a website in which user can add expenses on daily basis and at the end, based on user expenses report will be generated. User can select date range to calculate his/her expenses.

1.1 Project Overview

This website is used to track expenses and control spending beyond limits. while input data of expenses in website, we must select category which spent on and additionally notes can be used to note the details of expenses. By entering those record we can track our expenses. we can generate reports in graphical, pie chat. We can also set limits to particular category which alerts in email when the limits exceed.

1.2 Purpose

At end of certain period, users does not know where they spent their money and they spend more on needless expenses beyond budgets which leads to financial crisis. To avoid this people needs to track their expenses. While calculating in diary requires lot of manual calculation and lot of time. This is the purpose to go for website application to track expenses.

2. Literature Survey

2.1 Existing problem

People can't able to track their expenses and spending more on unnecessary expenses which leads to money crisis. Without tracking people can't know whether they exceed the limit of their budget. Diary notes requires lots of manual calculation and It reduces the interest to track expenses. User frustrated about they can't remember where their money goes and can't handle their cash flow. There is no alerting system about exceeding limits. There can be many disadvantages of using a manual accounting system. Accounting, for any business, can be a complex undertaking. A manual accounting system requires you to understand the accounting process in a way that may be unnecessary with a computerized accounting system.

This can be an advantage or a disadvantage, depending on the person doing the bookkeeping; often, a specially trained professional is needed to ensure that accounting is done properly. Unrevealing the complexity of your financial records by hand may be time consuming. Since it takes time to generate reports.

2.2 References

S. NO	PAPER TITLE	AUTHOR NAME	PUBLICATION YEAR
1.	Expense Tracker : A Smart Approach to Track Everyday Expense	Hrithik Gupta, Anant Prakash Singh, Navneet Kumar and J. Angelin Blessy	2020
2.	Expense Manager Application	A Velmurugan, J Albert Mayan, P Niranjana and Richard Francis	2020
3.	Income andExpense Tracker	P. Thanapal , Mohammed Yaseen Patel, T.P. Lokesh Raj and J. Satheesh Kumar	2015
4.	IRJET- Online Income and Expense Tracker	S. Chandini1, T. Poojitha2, D. Ranjith3, V.J. Mohammed Akram4, M.S. Vani5, V.Rajyalakshmi	2019

2.3 Problem Statement Definition

Our project helps the user to keep track their expenses and determine whether they are spending as per their set budget. Potential users need to input the required data such as the expense amount, merchant, category, and date when the expense was made. Which allows users to track their expenses daily, weekly, monthly, and yearly in terms of summary, bar graphs, and pie-charts. It is like automated diary which requires no burden of manual calculation and enables the user to not just keep the control on the expenses but also to generate and save reports. Users can insert and delete transactions. We can compare with past expenses. Customized email alerts are used alerts user when limit exceeds.

3. Ideation and Proposed Solution

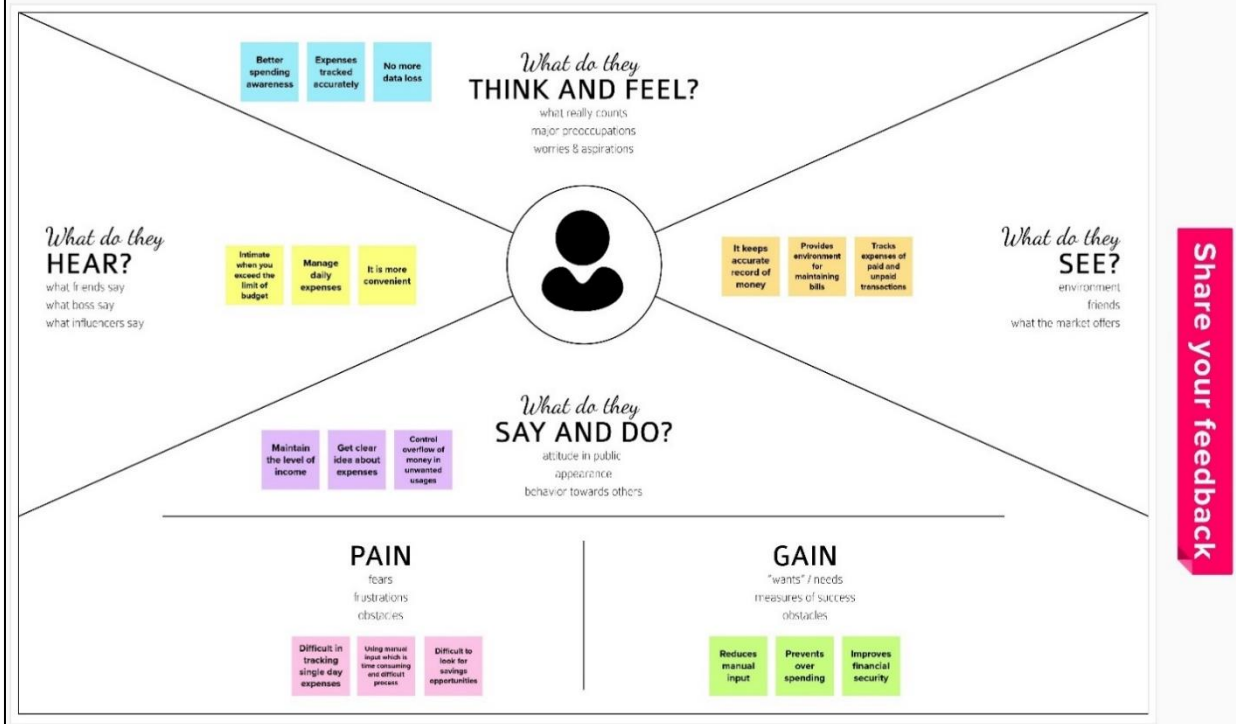
3.1 Empathy Map Canvas

Empathy Map Canvas

Gain insight and understanding on solving customer problems.

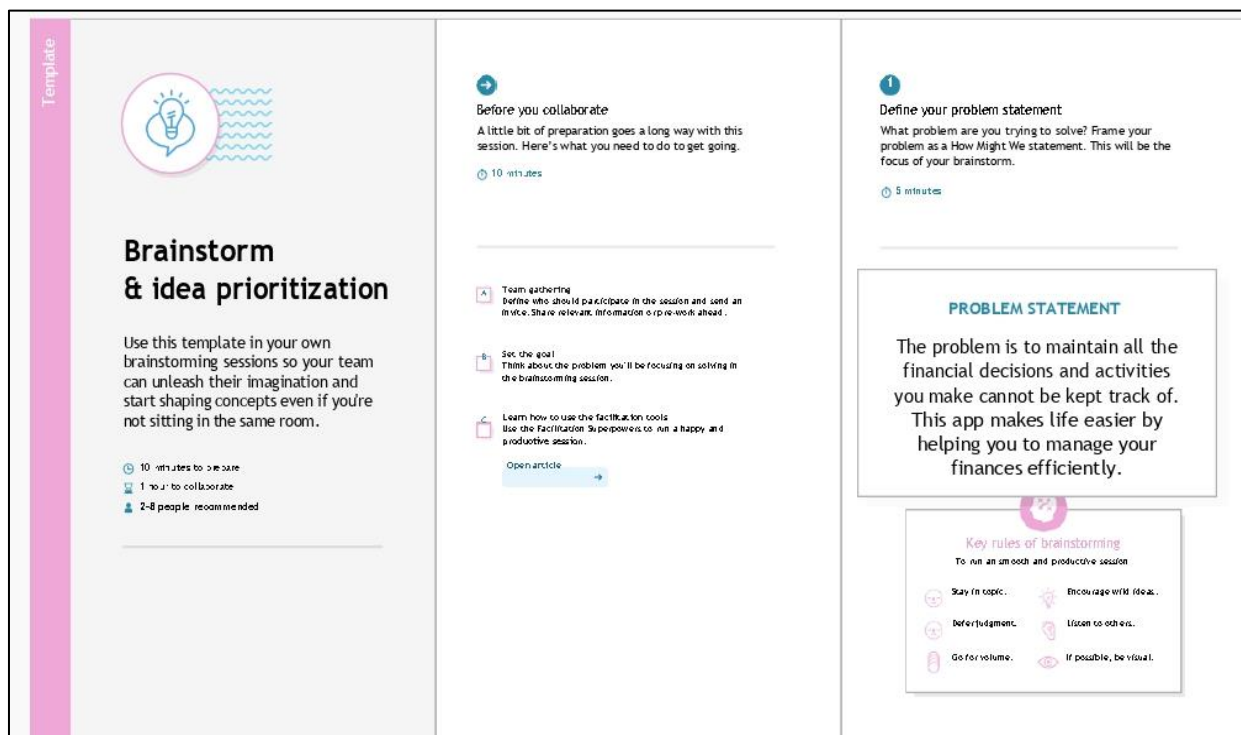
1

Build empathy and keep your focus on the user by putting yourself in their shoes.

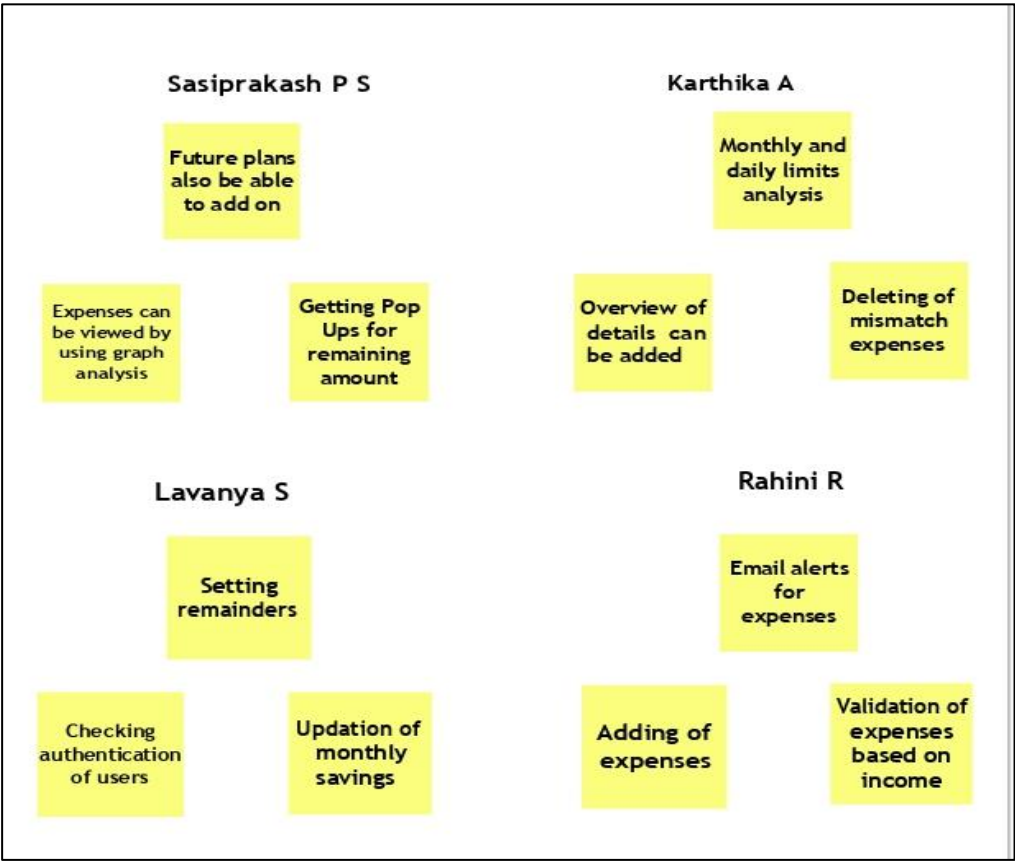


3.2 Ideation & Brainstorming

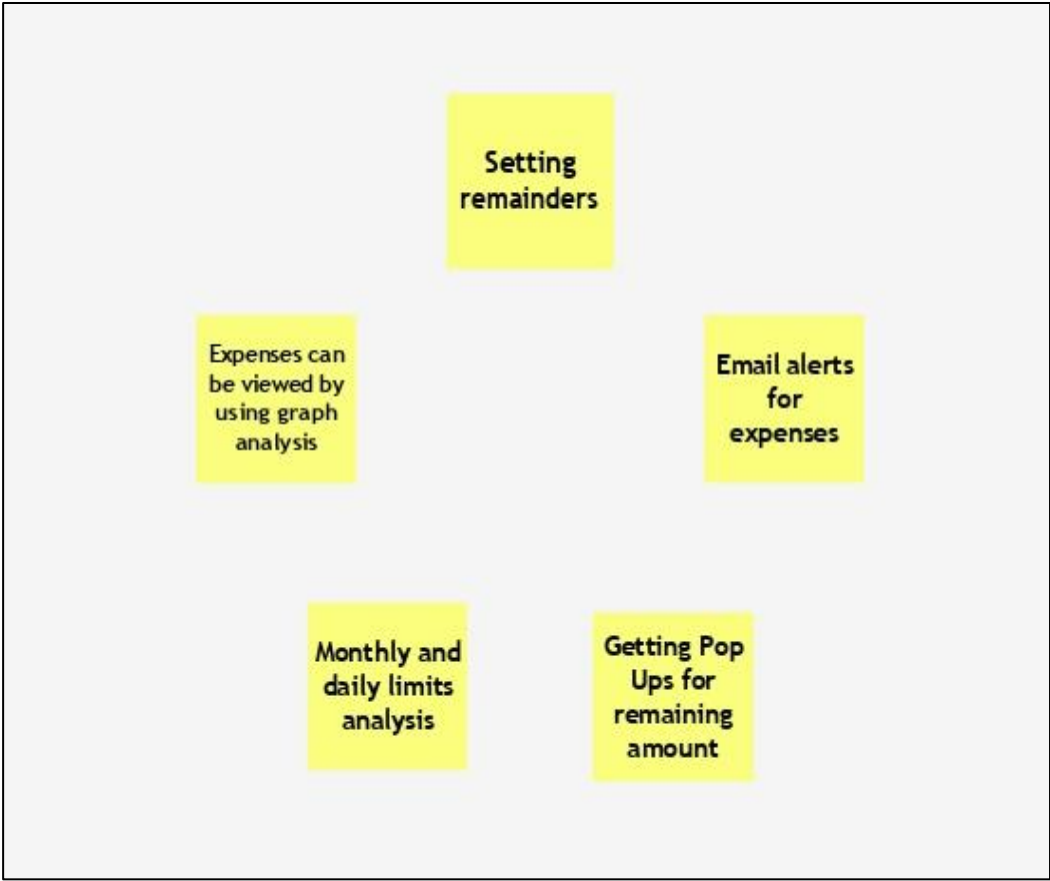
Step-1: Team Gathering, Collaboration and Select the Problem Statement



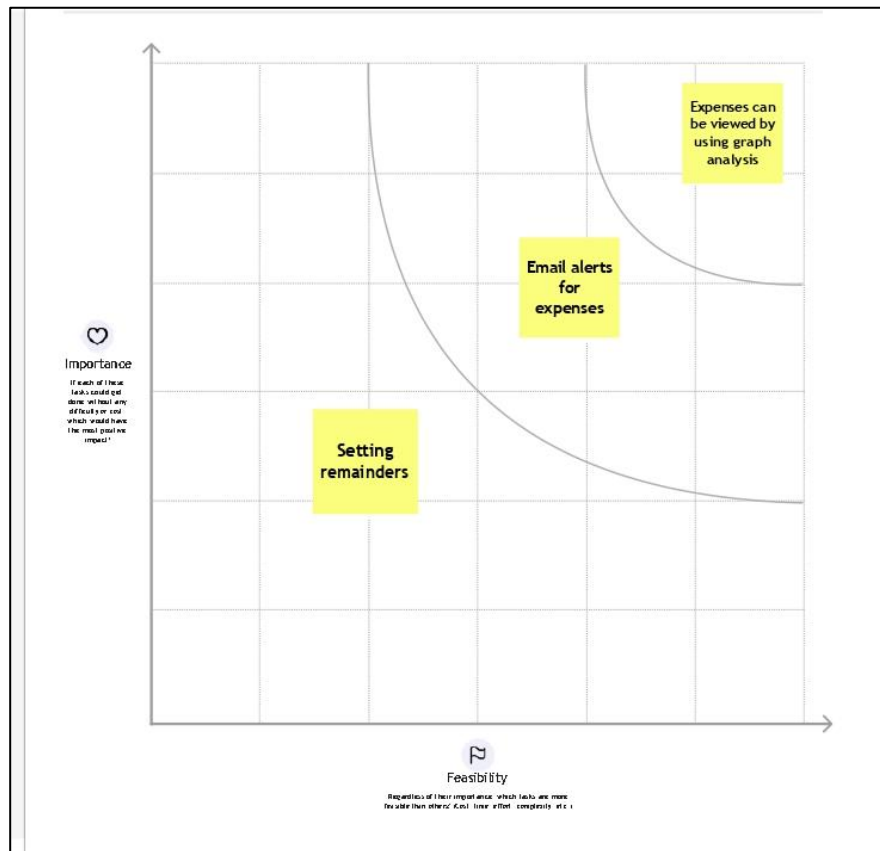
Step-2: Brainstorm, Idea Listing



Step-3: Idea Grouping



Step-4: Idea Prioritization



3.3 Proposed solution

S.NO	Parameter	Description
1.	Problem Statement (Problem to be solved)	As mentioned in the problem statement it helps the user to maintain a proper balance between their budgeting plan and expenditure. To avoid money crisis and helps the user keep track of every transaction they make and all the calculations need to be done by the user is avoided and the user can access it anywhere and anytime.
2.	Idea/Solution description	The above problem can be solved by monitoring and categorizing the expenses across different platforms like bank accounts, upi, investment accounts etc... with the budget plan created by the user.

3.	Uniqueness/Novelty	Expense tracker app provides a comparison of how you managed your expenses and budgeting plan across months/weeks. It also provides a reminder when the expenditure exceeds the allocated budget plan which helps the users plan their remaining resources.
4.	Social Impact / Customer Satisfaction	Customer satisfaction plays a important role in a product's outcome this application helps the users to take wise decision based on expenses, helps to manage their expenses and the app will be user- friendly (easily accessible).
5.	Business Model (Revenue Model)	This is will be a free source for users who use it for their monthly expenditure maintenance and revenue will be made by allotting paid versions for business users and other purpose users.
6.	Scalability of the Solution	This application will improve users financial security and maintain your privacy by allowing users to decide you wish what info they wish to share. This application can handle multiple users at a time without slowing down the application and it can be used for small- and large- scale purposes.

3.4 Problem solution fit

Problem-Solution fit canvas 2.0

PERSONAL EXPENSE TRACKER APPLICATION

TEAM ID : PNT2022TMD06813

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS <small>Who is your customer? i.e. working parents of 0-5 y.o. kids</small> <ul style="list-style-type: none"> Customers are those who spend money without keeping track of it or struggling to keep track of it. Provides a whole lot of different categories of expenditure types to avoid mismatch of expenditure. 	6. CUSTOMER CONSTRAINTS CC <small>What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.</small> <ul style="list-style-type: none"> Most of the solution available in the internet hosts a lot of adds limiting its usability. The solution proposed has a feature to view the expense graphically and has an alert via email feature. 	5. AVAILABLE SOLUTIONS AS <small>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros & cons define solutions here? i.e. pen and paper is an alternative to digital accounting</small> <ul style="list-style-type: none"> Expense tracker applications which are available in both android and iOS. Personal Expense tracker developed in this project. 	Explore AS, differentiate
	2. JOBS-TO-BE-DONE / PROBLEMS J&P <small>Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one, explore different sides</small> <ul style="list-style-type: none"> The objective of this application is to enable customers to keep track of their expenses. The customers are provided with categories for the expenses. They also get an option to view the expenses as a graphical representation given the period of 1 year, 6 months etc. 	9. PROBLEM ROOT CAUSE RC <small>What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.</small> <ul style="list-style-type: none"> Improper expenses lead to heavy tax. Makes business forecasting easier. Saves a lot of money. Existence of lot of payment methods leads to problem in manual expense tracking. 	7. BEHAVIOUR BE <small>What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate range and benefits, indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)</small> <ul style="list-style-type: none"> Start using the expense tracker app. Makes sure the user categorizes the expense done in order to save money. Set up a monthly limit on the expense done. 	
3. TRIGGERS TR <small>What triggers customers to act? i.e. seeing their neighbour install solar panels, reading about a more efficient solution in the news.</small> <ul style="list-style-type: none"> Understanding the fact, the customers can save a lot of money by these expense tracking apps. 	10. YOUR SOLUTION SL <small>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill entire canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behavior.</small> <ul style="list-style-type: none"> Design a flask based personal expense tracker application. Enable email-based expense alerts using SendGrid framework. Provide an option for graphical expense view. 	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE <small>What kind of actions do customers take online? Extract online channels from #7</small> <ul style="list-style-type: none"> Expense trackers online come with a lot of ads which on clicking steals data like account number if provided. 8.2 OFFLINE <small>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</small> <ul style="list-style-type: none"> Make sure they are aware of the tax rules. 	Extract online & offline CH of BE	
4. EMOTIONS: BEFORE / AFTER EM <small>How do customers feel when they face a problem or a job and afterwards? i.e. lost, insecure > confident, in control - use it in your communication strategy & design.</small> <ul style="list-style-type: none"> They feel a lot clear about the income and expenses made. 				

4. Requirement Analysis

4.1 Functional Requirements

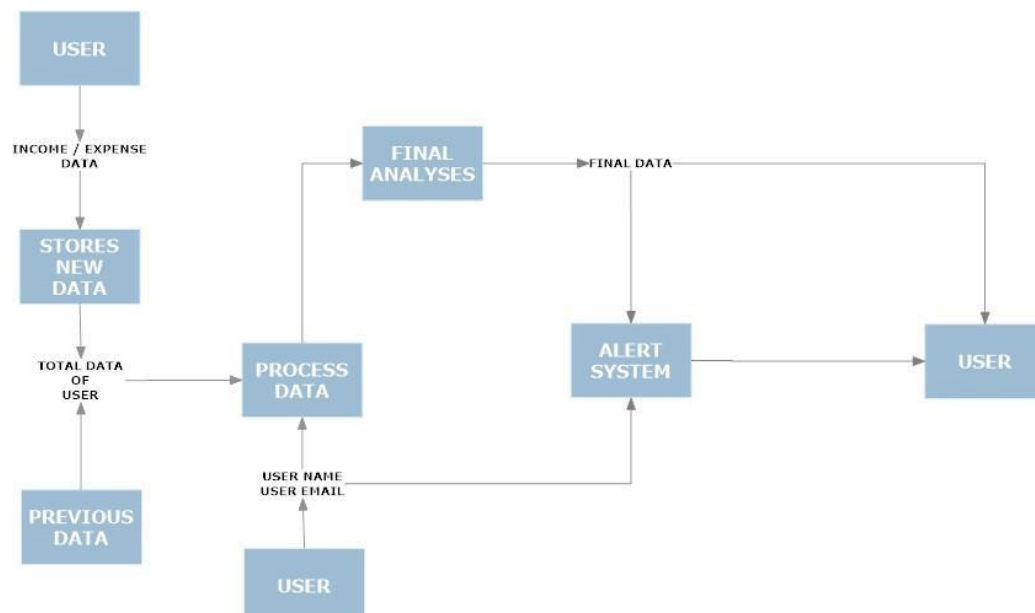
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Access / Login	Login through e-mail ID & Password
FR-4	User Data	Adding user expenses through input field & categories
FR-5	User Alert	Alerting user through registered e-mail ID

4.2 Non-functional Requirements

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	User friendly interface
NFR-2	Security	Strong security system
NFR-3	Reliability	Highly reliable for the old age people to track the expenses
NFR-4	Performance	Low data usage, instant email alerts while exceeding limits.
NFR-5	Availability	Available for all platforms (Mobile User, Web User)
NFR-6	Scalability	Access Anywhere Anytime

5. Project Design

5.1 Data-Flow Diagrams



5.2 Solution & Technical Architecture

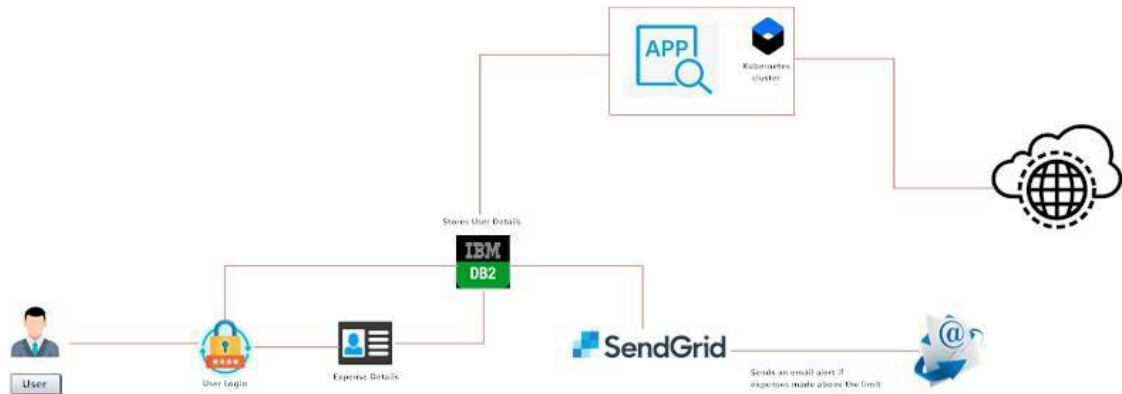


Table-1 : Components & Technologies

S.No	Component	Description	Technology
1.	User Interface	Web UI	HTML, CSS, JavaScript
2.	Application Logic-1	Backend Process – Web page route, Db Connection	Python Flask
3.	Application Logic-2	Docker containers	Docker
4.	Cloud Database	Database Service on Cloud	IBM DB2
5.	File Storage	File storage requirements	IBM Object Storage
6.	External API-1	Sending email alert	Sendgrid
7.	Infrastructure (Server / Cloud)	Application Deployment on Cloud Cloud Server Configuration : 1vCPU, 1 Cluster, 25GBObject Storage	IBM Kubernetes Cluster

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Flask	Python
2.	Security Implementations	SSL Certificate	SHA-256, Encryptions

3.	Scalable Architecture	3 – tier Architecture, Micro-services	Kubernetes with Docker
4.	Availability	load balancers, distributed servers	IBM Cloud
5.	Performance	15 connections at a time, 200Mb of Data Storage	IBM Db2

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority
Customer (Mobile user & web 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
		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
		USN- 3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low
	Login	USN - 4	As a user, I can log into the application by entering email & password	I can access the application	High
	Dashboard	USN - 5	As a user I can enter my income and expenditure details.	I can view my daily expenses	High
Customer Care Executive		USN – 6	As a customer care executive I can solve the log in issues and other issues of the application.	I can provide support or solution at any time 24*7	Medium
Administrator	Application	USN - 7	As a administrator I can upgrade or update the application.	I can fix the bug which arises for the customers and users of the application	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
1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Sasiprakash P S Karthika A Lavanya S Rahini R
1		USN-2	As a user, I will receive email once I have registered for the application	1	High	Sasiprakash P S Karthika A Lavanya S Rahini R
1		USN-3	As a user, I can register for the application through Facebook	2	Low	Sasiprakash P S Karthika A Lavanya S Rahini R
1		USN-4	As a user, I can register for the application through Gmail	2	Medium	Sasiprakash P S Karthika A Lavanya S Rahini R
1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	Sasiprakash P S Karthika A Lavanya S Rahini R
2	Dashboard	USN-6	Logging in takes the user to their dashboard.	2	High	Sasiprakash P S Karthika A Lavanya S Rahini R
2		USN-7	As a user, I will update my balance amount or income at the start of each month.	2	Medium	Sasiprakash P S Karthika A Lavanya S Rahini R
2		USN-8	As a user, I will set a limit of the amount to spend.	2	Medium	Sasiprakash P S Karthika A Lavanya S Rahini R
3	Database	USN-9	As a user, I can view the track of my expenses	4	High	Sasiprakash P S Karthika A Lavanya S Rahini R
4	Deployment	USN-10	Container of applications using docker kubernetes and deployment the application.	4	High	Sasiprakash P S Karthika A Lavanya S Rahini R

6.2 Sprint Delivery Schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed	Sprint Release Date(Actual)
Sprint-1	8	6 Days	24 Oct 2022	29 Oct 2022	8	29 Oct 2022
Sprint-2	6	6 Days	31 Oct 2022	05 Nov 2022	6	05 Nov 2022
Sprint-3	4	6 Days	07 Nov 2022	12 Nov 2022	4	12 Nov 2022
Sprint-4	4	6 Days	14 Nov 2022	19 Nov 2022	4	19 Nov 2022

Velocity

Velocity is a metric that predicts how much work an Agile software development team can successfully complete within a two-week sprint (or similar time-boxed period). Velocity is a useful planning tool for estimating how fast work can be completed and how long it will take to complete a project

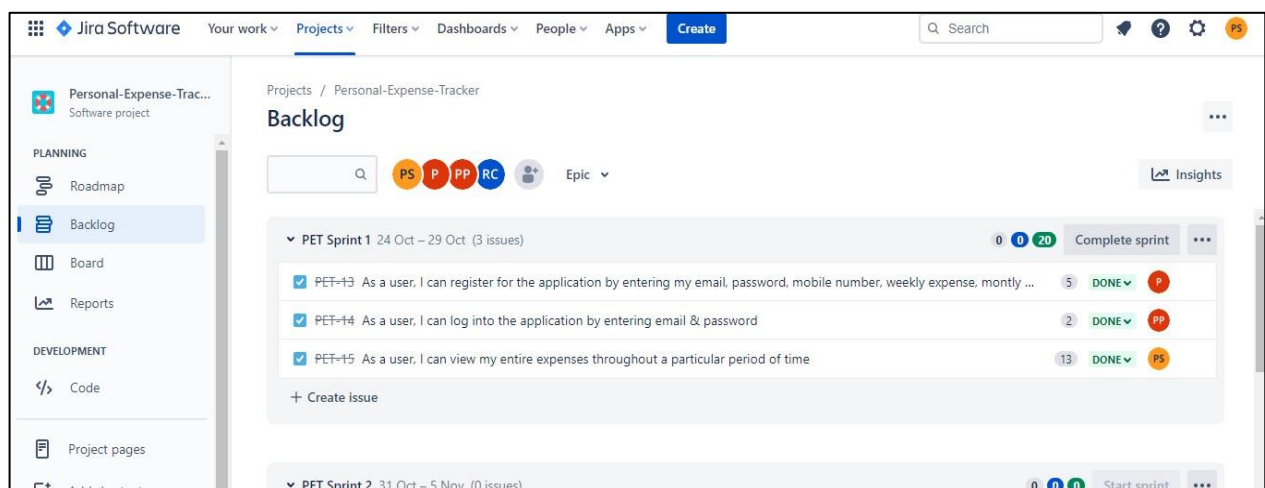
Average velocity = Total story points/ No. of iterations = 22/4 = 5.4

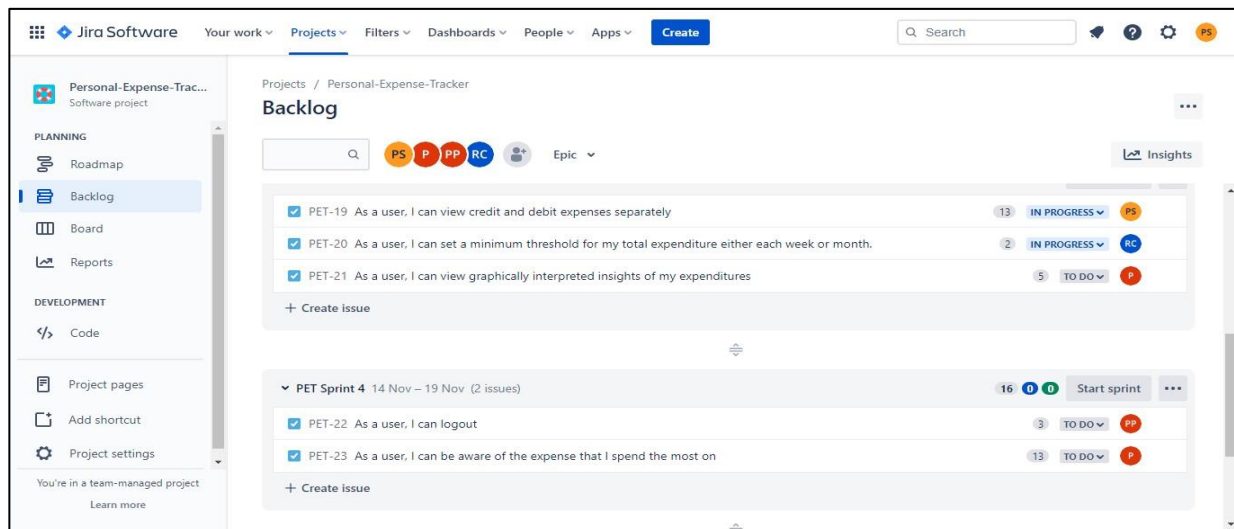
Burndown Chart:

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.



Reports from JIRA





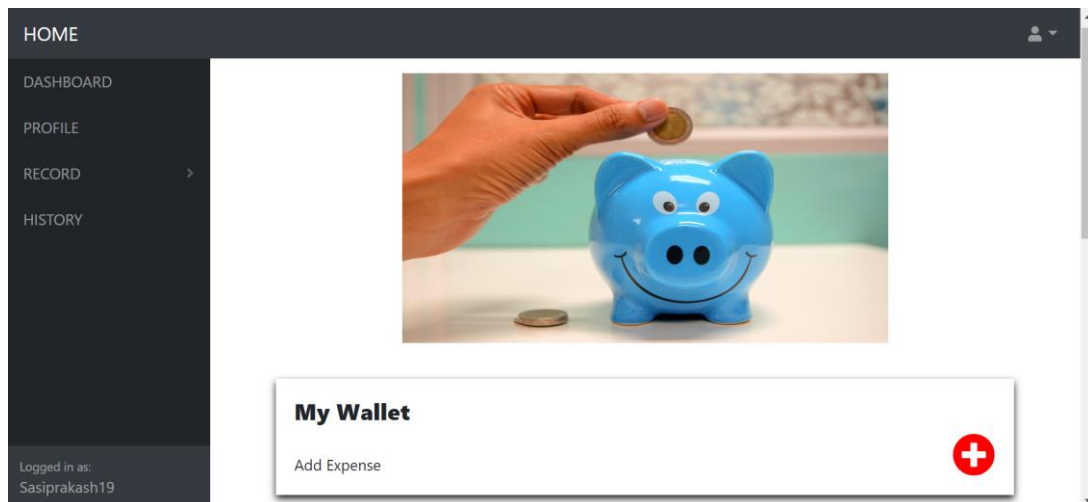
7. Coding and Solutioning

7.1 Feature 1

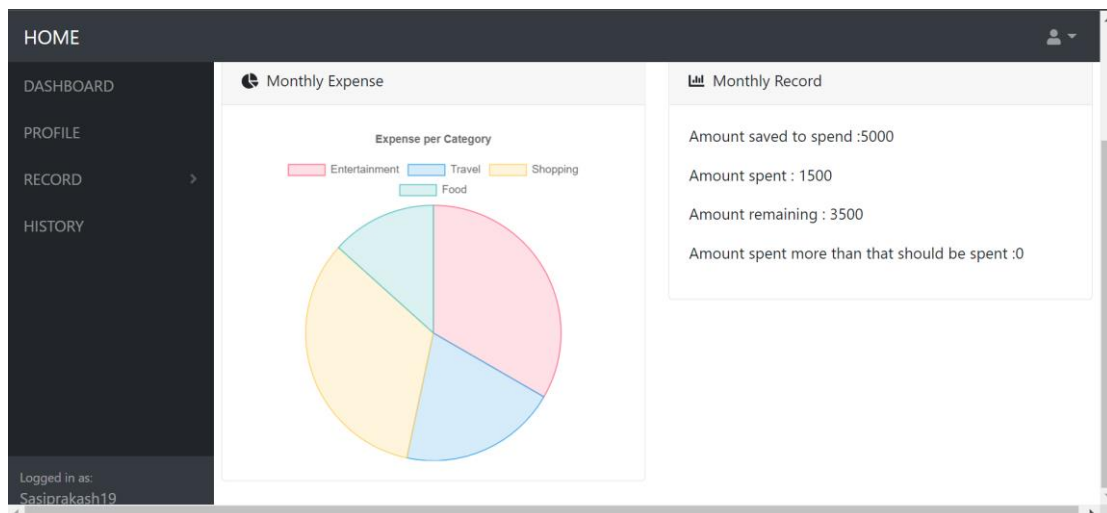
Sign-up page

Login page

7.2 Feature 2



Dashboard



Stats page

8. Testing

8.1 Test cases

1. Login button click with wrong credentials entered.
2. Signup with already registered mail ID.
3. Signup with wrong form data entered.
4. Entering home page with logged out session.
5. delete expense triggers change in graph.
6. Add expense without choosing category.

8.2 User Acceptance Testing

S. No	Test Case id	Feature Type	Test description	Input test Data	Actual output	Expected output	Remarks
1	TC – RG 01	Functional	Register for application by entering my name, email, password, monthly limit	User1 User1@gmail.com ***** 5000	Registration successful	Registration successful	pass
2	TC – SI 01	Functional	Log into the application by entering Email & password	User1@gmail.com *****	Login successful	Login successful	pass
3	TC – ST 01	UI	View my entire expenses throughout a particular period of time		Expenses are displayed for particular time	Expenses are displayed for particular time	pass
4	TC – DB 01	UI	Display graph in dashboard		Graph is displayed	Graph is displayed	pass
5	TC – ST 02	Functional	Generate reports based on my previous expenditures		Reports generated in graphical form	Reports generated in graphical form	pass
6	TC – SI 02	Functional	Can logout		Go to sign page	Sign in page displayed	pass

7	TC – ST 03	Functional	Create expense	14-11-2022 100 Food	Expenses created	Expenses created	pass
8	TC – ST 04	Functional	Can edit ,delete, update expense		Expenses updated	Updated of expenses	pass
9	TC – ST 05	UI	Can view Credit and debit expenses separately.		Expenses are listed separately	Expenses are listed separately	pass
10	TC – ST 06	UI	Aware of the expense that I spend the most on		Expenses are listed for particular category	Expenses are listed for particular category	pass
11	TC – PG 01	Functional	Able to update my set monthly limit		Monthly limit updated	Monthly limit updated	pass
12	TC – PG 01	UI	Able to View my profile		Profile details displayed	Profile details displayed	pass

9. Results

9.1 Performance Metrics

1. Hours worked : 50 hours
2. Stick to Timelines : 100%
3. Consistency of the product : 75%
4. Efficiency of the product : 80%
5. Quality of the product : 85%

10. Advantages and Disadvantages

Advantages

- Which allows users to track their expenses daily, weekly, monthly, and yearly interms of summary, bar graphs, and pie-charts.

- Separate view for credit and debit transactions
- no burden of manual calculations
- generate and save reports.
- You can insert, delete records
- You can track expenses by categories like food, automobile, entertainment, education etc..
- You can track expenses by time, weekly, month, year etc..
- Setting monthly limits and we can update it later
- Customized email alerts when limit exceeds.

Disadvantages

- User have entry every records manually
- The category divided may be blunder or messy
- Can't able to customized user defined categories

11. Conclusion

In this project, After making this application we assure that this application will help its users to manage the cost of their daily expenditure. It will guide them and make them aware about their daily expenses. It will prove to be helpful for the people who are frustrated with their daily budget management, irritated because of the amount of expenses and wish to manage money and to preserve the record of their daily cost which may be useful to change their way of spending money. In short, this application will help its users to overcome the wastage of money.

12. Future Scope

In further days, there will be mails and payment embedded with the app. Also, backup details will be recorded on cloud.

- Here user can define their own categories for expense type like food, clothing, rent and bills where they have to enter the money that has been spend .
- Alerts for paying dues and remainders to record input at particular user defined time.

13. Appendix

Github Link : <https://github.com/IBM-EPBL/IBM-Project-19667-1659703752>

Project Demonstration Link : <https://vimeo.com/771569805>