NALAYATHIRAN PROJECT UNDER NAAN MUDHALVAN
SCHEMEBY THE INITIATIVE OF THE

GOVERNMENT OF TAMILNADU

SUBMITTED BY

COLLEGE NAME:JEPPIAAR ENGINEERING COLLEGE

TEAM ID   : PNT2022TMID26966

PROJECT DOMAIN : CLOUD APPLICATION

DEVELOPMENTPROJECTNAME :

PERSONAL EXPENSE TRACKER

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INTRODUCTION

PROJECT OVERVIEW:-

Personal finance entails all the financial decisions and activities that a Finance app makes your life easier by helping you to manage yourfinances efficiently. A personal finance app will not only help you with budgetingand accounting but also give you helpfulinsights about money management.

Personal finance applications will ask users to add their expenses and based on their expenses wallet balance will be updated which will bevisible 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.

PURPOSE :-

Personal Expense Tracker Application is designed for the people who are unaware of their daily expenses. It is planned to solve the issues like poor financial management, unnecessary expenditure, no proper savings, etc. People will be aware of their daily expenses which will lead to the proper savings. We can reduce the unwanted daily expenses, save money in a better manner, daily expenses can be tracked and it will alert us when we are in a shortage of money. It reduces man power for accounting and financing the money, human errors can also be eradicated.

LITERATURE SURVEY

PERSONAL EXPENSE TRACKERAPPLICATION

A. **INTRODUCTION**

Tracking regular expense is a key factor to maintain a budget. People often track expense using pen and paper method or take notes in a mobile phone or a computer. These processes of storing expense require further computations and processing for these data to be used as a trackable record. In this work, we are proposing an automated system named as Expense to store and calculate these data. Expense is an application that runs on Android smartphones. By using this

application, users can save their expense by simply scanning the bills or receipt copies. This application extracts the textual information from the receipts and saves the amount and description for further processing. It also monitors user‟s income by tracking the received SMS‟s from the user‟s saving accounts. By calculating income and expense it produces the user‟s balance in monthly and yearlybasis. Overall, this is a smart automatedsolution for trackingexpense.

Fromthe beginning of human civilization, people have exchangedtheir fortune with each other for buying or selling goods. It has become a crucial and unchangeable part of our daily life since then. Most of us have a fixed income and we get it in a timely basis (i.e. daily, monthly, yearly etc.). Moreover, everyone follows a strict budget of expense. Generally, the budget is assembled as per category. The categories are distinct, for example, food, entertainment, transportation, education, healthcare, clothingetc. However, the budget of expense is restricted to the income.For that reason,we need to track our expense so that it doesn‟t exceed our budget. In old days, people used to track their expense manually i.e., using pen and paper system which takes a lot of effort and time. Nowadays,the availability of electronic deviceslike smartphones, computers have made our life a lot easier and faster. We can use computers to track our daily expense by using the online and offline software available. But the computer is not accessible all the time. The smart solution to the problem is to use smartphones.

B. **INTERFACE DESIGN**

Our application is designed by following the Google Design Pattern rules . So

that the users can use it with ease. The interface is simple and user-friendly. The contents of our application are divided into four major sections. Those are Debit, Credit, Balance, and History. The debits and credits are shown in different lists. The last entry is always on top of the list and the previous one is just below the last entry and so on. It allows users to access their latest entries first. Also, there is a search option for searching debit or credit entries. There is a floating action button on debit and credit interface which is used to add new records. Therefore, new debit or credit entries can simply be added by tapping the floating add button. In the balance section, there are different pie charts showing the proportion of debits and credits . The history section is represented by a calendar view where debit and credit entries of a particular date can be seen by tappingon a date.

C. **PROPOSED SYSTEM**

Our proposed solution is a smart assistant for the users to track daily expense. The users simply need to scan receipts of any kind with their smartphone camera and our application is smart enough to detect the necessary words and amount from the receipt. The data of the expenditure is then saved on the database category wise. Our application structure has been divided into two major parts. One is debit and another is credit. All the expenditures are included in the debit part and the incomes are included in the credit part. The incomes are calculated automatically from the messages receivedin the inbox. There are some additional features available in our system. The users can set a total budget for the whole month as well as for individual categories. The system will notify the users if they attempt to exceed the set budget. There is a pie chart (see figure 5) representation to summarize the total expense. A calendar view (see figure 6) is also available to show the expense histories of the users. Our approach solves many issues and limitations of the currently available expense tracking systems in the market. It saves a lot of time and efforts of the users as the major processing is automaticallydone by the application.

D. **SYSTEM OVERVIEW**

Expense is divided into four major sections. Those are Debit, Credit, Balance,

and history. This system works as a one tap solution for tracking everyday expense. It also preserves yearly and monthly records. For the availability of the records, userscan check their histories to keep track of their expenseso that they do not exceed t

E. **Credit:**

The credit information can be stored using the mechanism . When users open the credit interface, the system reads all the messages from the user"s messaging inbox. If the messages are from the bank about any transaction of credit, the app reads it and saves necessary information from the messages (SMS). There is also another option for saving credit. The users can manually give the input of credit in the app. After successfully saving the input, they can view the data on the list view.Figure 4 shows the credit input technique.

F. **Balance:**

In balance interface, users can see two different types of pie charts, which are yearly and monthly balance. The pie charts represent the total estimation from all the categories (e.g., food, entertainment, transportation, education, healthcare, clothing, bank, groceries). Yearly balance includes the credit and debit information of a specific year. Monthly balance includes all the credit and debit information of 6 months.

G. **CONCLUSION**

In today"s world, time is the most valuable asset because people lack ample of it. People are obsessed with completing tasks in lesser time and our system is an approach serving this purpose. Expense can manage daily expense much faster than any other traditional app in the market which takes manual input. Our system proves to be most effective for the people aged 40 and over and an efficient solution comparing to any of the traditional applications. Nowadays, the world is leaning towards the one tap solution and our system is one of a kind. After all, automation is the way of future and Expensecan be a step towardsit. The application still has a lot of aspects that need to be improved. The app performs poorly if the inputimage from the receipt includesa lot of noises.

The app is

unable to detect the region of interest automatically. On that note, the user has to set the region of the receipt to have a better result. Again, the performance of the characterrecognition from the receipt declines in low lights. Therefore, this system triggers few research scopes which can be a starting point for the improvement of the proposedapproach.

H. **REFERENCE**

1. "44% of World Population will Own Smartphones in 2017." [Online]. Available: https://www.strategyanalytics.com/strategyanalytics/blogs/smart-phones/2016/12/21/44-of- world-populationwill-own-smartphones-in-2017#.Wq1BcehuY2y.

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PROBLEM STATEMENT

DOMAIN: CLOUD APPLICATION DEVELOPMENT

PROJECT : PERSONAL EXPENSE TRACKER APPLICATION

WHO DOES THEPROBLEM AFFECT?

People who are unawareof their daily expenses

WHAT IS THE ISSUE?

* Poor Financial Management

1. Unnecessary Expenditure

2. Not Proper Savings

What is the Impactof the Issue?

People will be unawareof their dailyexpenses which can leadto unnecessaryexpenditure and not proper savings can be done.

What would happen if we didn't solve the problem?

3. Financial crisis may occur

What would happen when it is fixed?

we can reduce unwanteddaily expenses, we can save money in a better manner,daily expenses can be tracked,alerts when we are shortageof money.

WHY IT IS IMPORTANT THAT WE FIX THE PROBLEM?

Proper savings can be done and we can reduce the daily expenses and the application gives proper analysisof our expenditure and income.It reduces manpower for accounting and financing the money, human errors can be eradicated.

IDEATION AND PROPOSED SOLUTION

EMPATHY MAP LINK :

https://drive.google.com/file/d/1zA5PlG_oJd93zVLHf4rZQmgM3ORYpV6x/view?usp=share_link

IDEATION AND

BRAINSTROMING

BRAINSTROM :

https://drive.google.com/file/d/1Px76j5jsAp3r3-8Hh_dCzkdAqbqH7_9a/view?usp=share_link

PROBLEM SOLUTIONFIT :

https://drive.google.com/file/d/1qzIQ0p0ACzWGpFa_xcseDb7XWSn0mIZe/view?usp=share_link

PROPOSED SOLUTION

Problem Statement (Problemto be solved) :

People who are unawareof their daily expenses

Idea / Solution description :

Proper savings can be done and we can reduce the daily expenses and the application gives proper analyses of our expenditure and income. It reduces man power for accounting and financing the money, human errors can be eradicated.

S.NO.	Parameter	Description
1.	Problem Statement	In paper-based expense tracker systemit is difficult to track our monthly expenses manually. In paper-based expensetracker system it is difficult to track our monthly expenses manually. The paper-based expense records may get lostin case of fireaccidents, flood etc.
2.	Scalability of theSolution	This application can handle large number of usersand data with high performance and security. This application can adapt for both large-scale and small-scale purposes. Easily available in all kinds of devices.

3.	Idea / Solution description	Daily expensemanagement system whichis specially designed for non-salaried and salaried personnel for keeping trackof their dailyexpenditure with easy and effective way through computerized system whichtends to eliminate manual paper works. Personal finance applications will ask users to add their expenses and based ontheir expenses walletbalance will be updated which will be visible to the user. 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 willbe notified with an emailalert.
4.	Novelty / Uniqueness	The usergets notified when theirexpense exceeds the limit and alsoit reminds the user whenthey

		forgot to make entry. Tracking expenses through SMS.Data analytics on expenses. Futureexpenseprediction
5.	Social Impact/ Customer Satisfaction	The application should be able to generate reports of their spending and notify users if they haveexceeded their budget. It is designed to be dynamicto produce the prediction. It also provides users' personal information, their income as well as their expenses. This application can create awareness among common people about finance and stuffs. This application also

		helps user to be financially responsible. It Reduces time rather than entering detailsmanually.
6.	Business Model (Revenue Model)	This Application is provided for free of cost. But It will have some advertisement. In premium versionthere is no advertisement and contains some additional features.

REQUIREMENT ANALYSIS

Functional Requirements:

Following are the functional requirements of the proposedsolution.

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration throughLinkedIN
FR-2	User Confirmation	Confirmation via EmailConfirmation via OTP
FR-3	User Access / Login	Login through email id & password

| FR-4	User Data	Adding user expenses through input field & categories.
FR-5	User Alert	Alerting throughtheir email id.

Non-functional Requirements:

Following are the non-functional requirements of the proposedsolution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Capture and organize your payment receipts to keep track of your expenditure Monitoring the income andtracking all expenditures
NFR-2	**Security**	Increase your teamproductivity by providing access control to particular users through custom permissions.
NFR-3	**Reliability**	Increase efficiency and customer satisfaction with an app aligned to their needs. Seamlessly integrate with existing infrastructure
NFR-4	**Performance**	Deliver an outstanding customer experience through additional control over the app.
NFR-5	**Availability**	Website, Android App.
NFR-6	**Scalability**	Available anytime at anywhere. It have an ability of computing process to beused in the range of capabilities.

PROJECT DESIGN

DATA FLOW DIAGRAMS:

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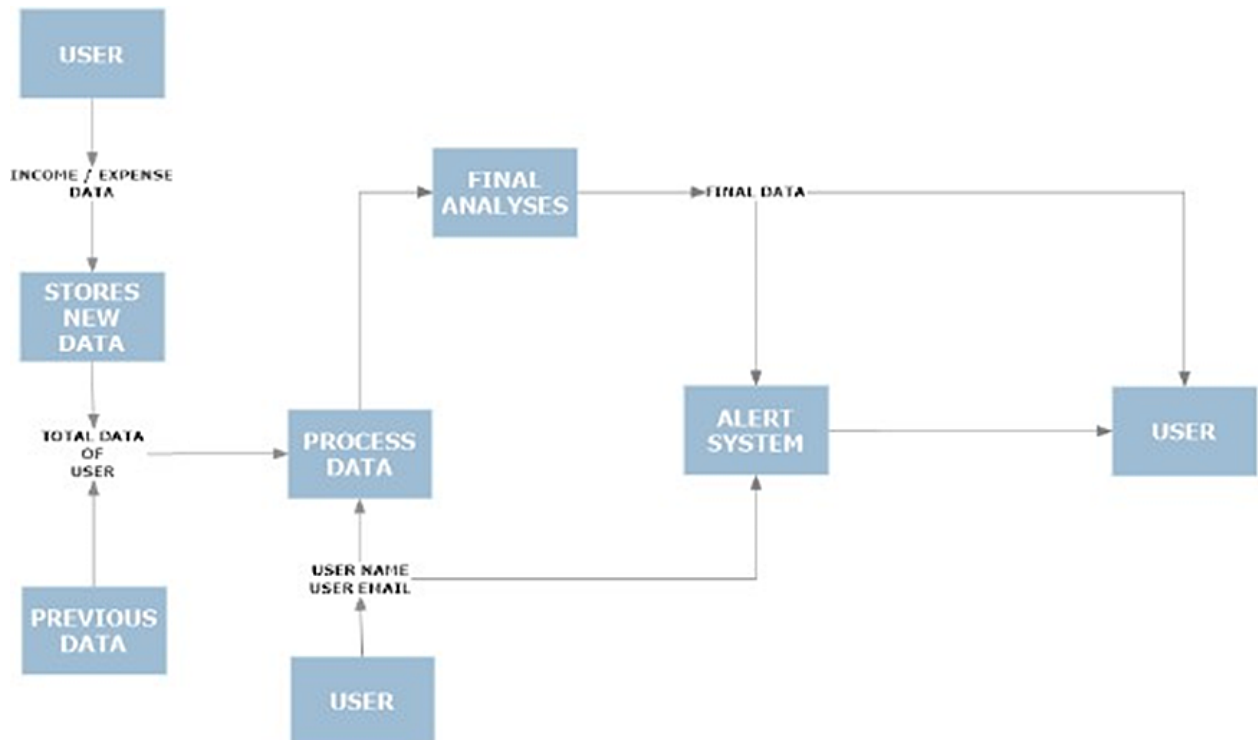
USER STORIES:

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

TECHNOLOGY ARCHITECTURE :

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2
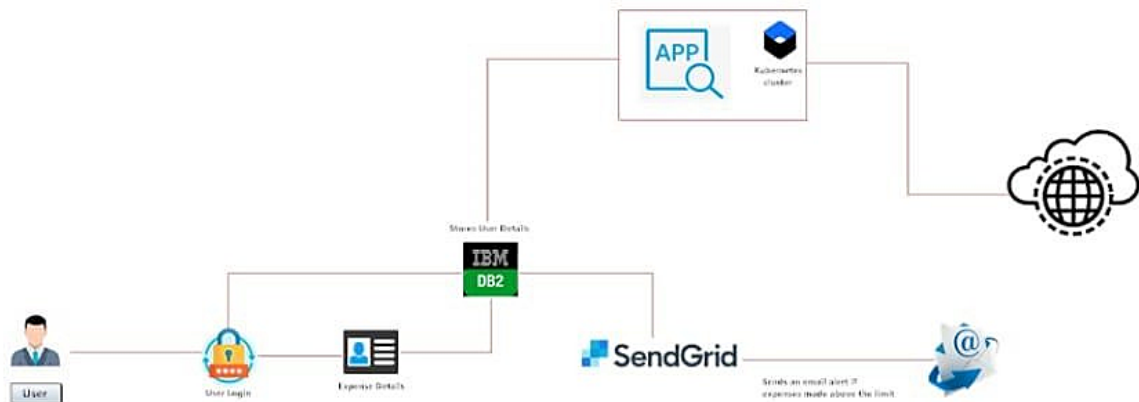
Table-2: Application Characteristics:

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

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, 25 GB Object Storage	IBM Kubernetes Cluster

SOLUTION ARCHITECTURE :

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

SOLUTION ARCHITECTURE DIAGRAM:
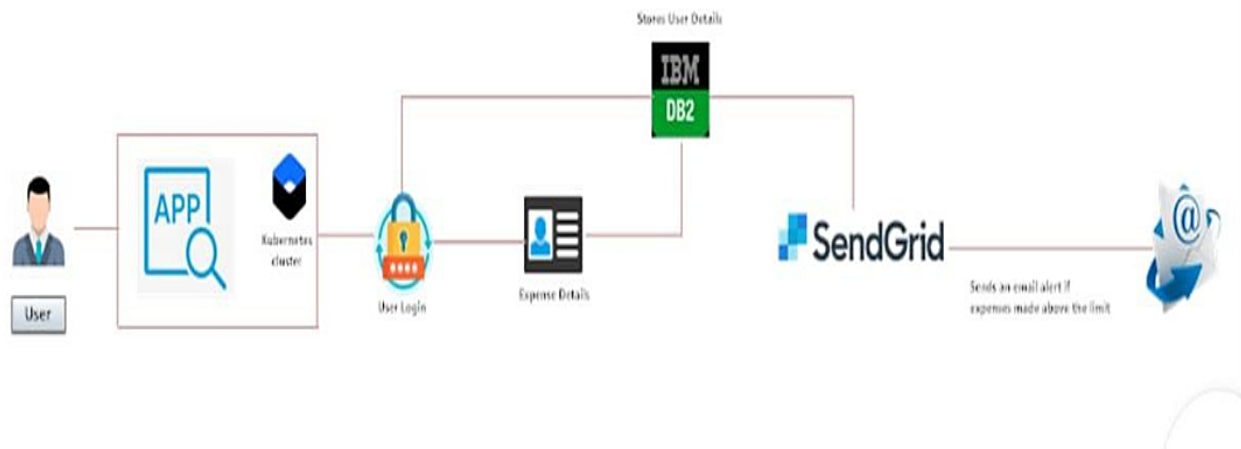
PROJECT PLANNINGAND SCHEDULING
SPRINT PLANNING AND ESTIMATION :

Project Planning Phase

Team ID	PNT2022TMID26966
Project Name	Personal Expense Tracker Application
Maximum Marks	8 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

| 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	Mohan Sai B H
		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Sathish S
	Login	USN-3	As a user, I can log into the application by entering email & password	1	High	Rajagopalan T
	Dashboard	USN-4	Logging in takes to the dashboard for the logged user.	`2	High	Shyam R
Bug fixes, routine checks and improvisation by everyone in the team *Intended bugs only						

| Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 2	Workspace	USN-1	Workspace for personal expense tracking	2	High	Sathish S
	Charts	USN-2	Creating various graphs and statistics of customer's data	1	Medium	Rajagopalan T
	Connecting to IBM DB2	USN-3	Linking database with dashboard	2	High	Shyam R
		USN-4	Making dashboard interactive with JS	2	High	Mohan Sai B H
Sprint-3		USN-1	Wrapping up the server side works of frontend	1	Medium	Rajagopalan T
	Watson Assistant	USN-2	Creating Chatbot for expense tracking and for clarifying user's query	1	Medium	Shyam R
	SendGrid	USN-3	Using SendGrid to send mail to the user about their expenses	1	Low	Mohan Sai B H
		USN-4	Integrating both frontend and backend	2	High	Sathish S
Bug fixes, routine checks and improvisation by everyone in the team *Intended bugs only						
Sprint-4	Docker	USN-1	Creating image of website using docker/	2	High	Shyam R
	Cloud Registry	USN-2	Uploading docker image to IBM Cloud registry	2	High	Mohan Sai B H
	Kubernetes	USN-3	Create container using the docker image and hosting the site	2	High	Sathish S
	Exposing	USN-4	Exposing IP/Ports for the site	2	High	Rajagopalan T

SPRINT DELIVERYSCHEDULE :

Project Tracker, Velocity & Burndown Chart: (4 Marks)

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	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

REPORTS FROM JIRA :
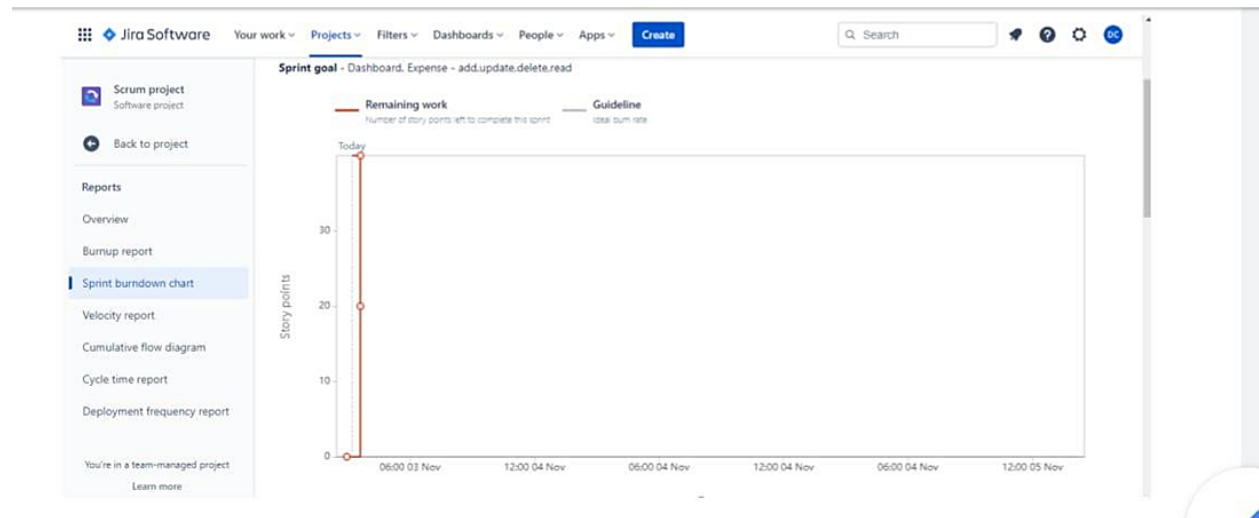
Roadmap:
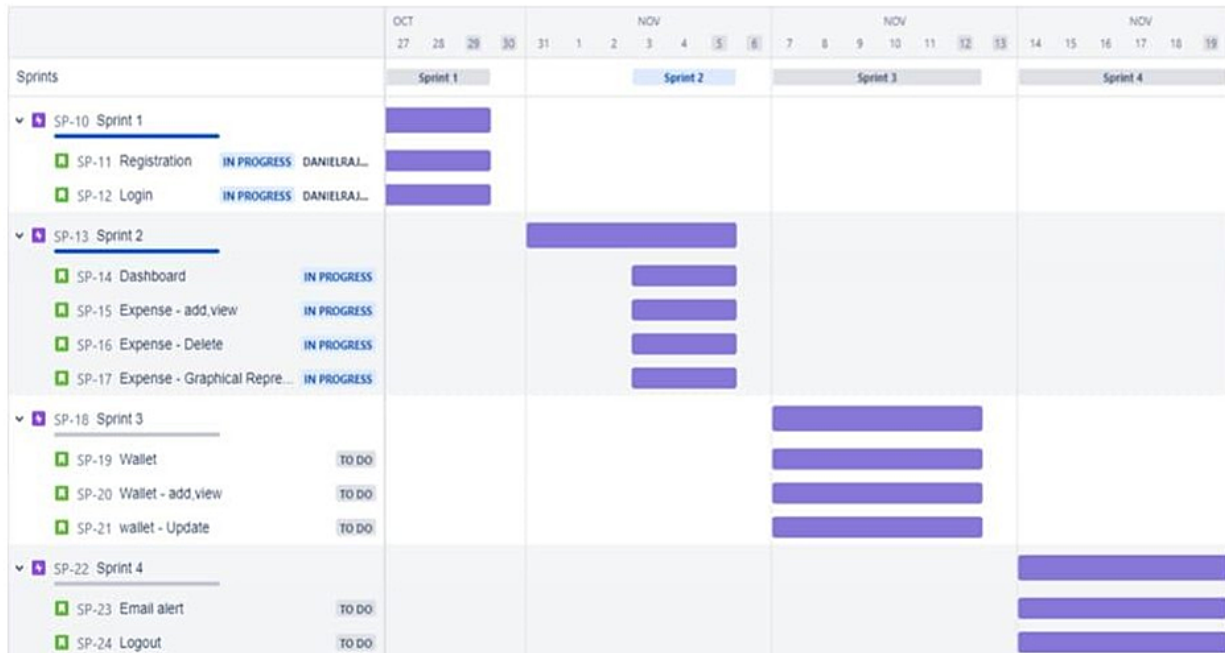
CODING & SOLUTIONING

CODE LINK : Github Link

FEATURES :

- ○ User can able to signupwith their mail ID and cancreate an account
- ○ User will receive an E-mailon successful registration
- ○ User can Login with their credentials and can access the dashboard
- ○ User can now add money to the wallet linked to their account
- ○ User can add expenses with the detail / category

- User can delete their expenseif they have added accidentially
- User can able to see their expenses in table form with complete detail andtime added
- User can see the total expenseamount below the table

- As the user add the expense amount the app automatically deducts theexpense amount from theirwallet
- If the amount goes below certain range the app automatically sends alertE-mail to the user"semail ID with wallet remaining balance amount
- User can update their wallet amount anytime

- User can see their expense details in graphical form
- User gets Popup notification for every change (Login, Signup, addingbalance, adding/ deleting expense,updating balance)
- The application can run in any devices such as Mobile,desktop, tabletetc….(Responsive Design)

- The application is deployed in IBM Cloud server, Database used – IBMDB2
- Application has Load balancing feature (nGinx) – As many users can usethe application without any reduction in speed
- User can able to logout of their application after completing their work

TESTING

1.Test cases

USER ACCEPTANCE TESTING REPORT

Purpose of Document

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

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
Sign Up Page	10	6	6	3	25
Log In Page	10	6	6	2	24
Main page (USER)	10	7	5	1	23
Flask Application	10	6	3	1	20
Database Connection	10	5	3	1	19
Send Grid Integration	10	6	2	3	24

Totals	60	37	22	12	135

Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Home Page	13	0	0	13
Log in	12	0	0	12
Sign in	8	0	0	8
Main page	9	0	0	9
Send grid and Databases Connection	46	0	0	46
Main page	9	0	0	9
Send grid and Databases Connection	45	0	0	45
Totals	87	0	0	87

RESULTS

ADVANTAGES & DISADVANTAGES

ADVANTAGES :-

i. Achieve your business goals with a tailored mobileapp thatperfectly fits your business.

ii. Scale-up at the pace your businessis growing.

iii. Deliver an outstanding customerexperience through additional control over the app.

iv. Control the security of your businessand customer data.

v. Open direct marketing channels with no extra costs withmethods such as push notifications.

vi. Boost the productivity of all the processes within theorganization.

vii. Increase efficiency and customer satisfaction with an appalignedto their needs.

viii. Seamlessly integratewith existing infrastructure.

ix. Ability to providevaluable insights.

x. Optimize sales processes to generate more revenue throughenhanced data collection.

DISADVANTAGES :-

1. Determining the rightprocess.

2. Feeling constrained.

3. Spending more than necessary.

4. Finding the time for it.

5. Making the right decisions.

6. Impacting how employees feel.

7. Overlooking important factors.

CONCLUSION

As a conclusion, our project Personal Expense Tracker is a very good upcomingapplication to solve the financial problems and other related problems. It is anuser friendly application. The customers will be successful in using this application and save more money without spending it lavishly. The users of thisapplication will manage the accounts effectively and keep a track on the investments and expenses to get a detailed report on it for further advancements

FUTURE SCOPE

The Expense Tracker app **tracks all the expenses and helps the user to manage his/herexpenses so that the user is the path of financial stability**. The Tracking of expenses is categorised by week, month and year, it helps to see the more expenses made.These apps analyze your SMSs and track your spends. So every time you spend on your debit card, credit card through any wallet, the expenses gets recorded automatically.

Let us assume that you spend Rs 500 at a coffee shop or Rs 2,000 at a petrol pump. The app will read the SMS with the amount deducted and the merchant name and add it to your list of expenses. It also tracks your ATM withdrawals. You can enter cash expenses manually

on the app.

Not only can you track your expenses, you can categorise them too. You can select from pre-defined categories like bills, groceries, shopping, eating out, fuel and so on and also adds custom categories. Every spending is grouped into categories. When you play your electricity bills, it gets grouped under „bills," when you go out for dining, the expenses gets grouped under „Eating out" and so on. So you know exactly how much of money you are spending under each of these categories.

APPENDIX

SOURCE CODE LINK : **Code Link**

GITHUB LINK : **Github Link**

DEMO LINK : **Demo video link**