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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 audits 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. Personal Expense 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

Personal Expense Tracker is a web application that allows you to track the daily expense of the user and help them to keep track of their expenses daily, monthly, and yearly basis. It will also create a digital record for the user's income and various expenses spent by the user is calculated. It also gets the input from the user as how much income earned, and the date of the income earned and further creates a transaction entry and sums up all the total income. Further we can give voice commands and it is responsive. It will be very helpful for the users to manage their needs and they can spend in a better way by keeping track of the application daily basis.

1.2 Purpose

The main purpose of personal expense tracker application is used to keep track of expenses based on the user's income and how much they spent and, they can keep track of their expenses daily, monthly, and yearly basis.

2. LITERATURE SURVEY

2.1 Existing problem

People can't be 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

Paper 1: Expense Tracker

Publisher: International Journal for Research in Applied Science & Engineering Technology.

The Expense Tracker is a Web application that facilitates the users to keep track their expenses. This application records all the expenses of the users, and the user can view them anytime. The application provides monthly and year-wise expenditures which will let the user know where he is spending the most. It also provides graphical visualizations which helps the user to perform detailed analysis on the expenditure.

Paper 2 : E-Expense: A Smart Approach to Track Everyday Expense

Publisher : IEEE

E-Expense is a mobile application that runs on the Android smartphones. Using this application, users can save their expense by scanning the bills and the receipt copies. Optical Character Recognition (OCR) is used to extract the information from the bills or receipts. It is also capable of tracking savings from user's saving accounts by reading the SMS's automatically from the message application of the android device. The application consists of four sections such as

debit, credit, balance and history. Debit section records the expenses of the user. The input can be given either manually by the user or the system will take automatically by scanning. When users open the credit interface, the system reads all the messages from the user's messaging inbox. The input can be given manually or it can be taken by the system automatically. This application allows users to set the budget for a month or year. When the limit exceeds, it sends a notification to the user. Balance section shows the monthly and yearly balance. History section contains calendar. By selecting a particular date, it shows the expenses on that day.

Paper 3 : Expense Tracker

Publisher : International Research Journal of Modernization in Engineering Technology and Science

The Expense Tracker is a mobile application that allows the users to download in their mobile phones and can be used to track and update their daily costs. So that they can keep track of their earnings. The user can know easily on how much the amount they have spent on the various things for household, clothing and house rentals and we can easily depict the cost to the user using pie charts. Based on this we can keep track of daily expenses that we spent in a single day. Moreover, this is an automated solution for tracking the expenses.

Paper 4 : Daily Expense Tracker

Publisher : International Journal of Research in Engineering and Science,

Daily Expense Tracker is a web application that allows you to track the daily expense of the user and help them to keep track of their expenses daily ,monthly ,weekly and yearly basis. It will also create a digital records for the user's income and various expenses spent by the user is calculated. It also gets the input from the user as how much income earned and the date of the income earned and further creates a transaction entry and sums up all the total income. Further we can give voice commands and it is responsive .It will be very helpful for the users to manage their needs and they can spend in a better way by keeping track of the application daily basis. Daily Expense Tracker application can be accessed from any browsers like Google chrome, Mozilla Firefox and it allows for portable work environment. We can also digitally maintain the records with visual representation and also graphically view them using bar graphs and pie charts on how much amount is being spent and can also eliminate the physical entries by using voice commands. Daily expense Tracker is an AI powered engine providing voice recognition which is very helpful

for the users to do the work in easiest way. The application is divided into three major components that is income, expense and create transaction section. Create transaction component allows user to choose from two categories whether it is a Expense or an Income and also choose from list of types of income or expense enter the amount and date and create entry. After the creation of transaction pie charts are created in the income or expense section based on type of transaction. All of these features can also be updated or deleted using users voice commands.

2.3 Problem Statement Definition

Personal Expense Tracker will be a useful and helpful application that helps us to track the financial expenses regularly and more efficiently. We can record and track our daily transactions through this useful application. This application will also be helpful to track how much amount has been spent on various things such as food, entertainment, etc. We can compare our expenses daily, month wise and year wise so that we can plan our upcoming accordingly.

3. IDEATION AND PROPOSED SOLUTION

3.1 Empathy Map Canvas

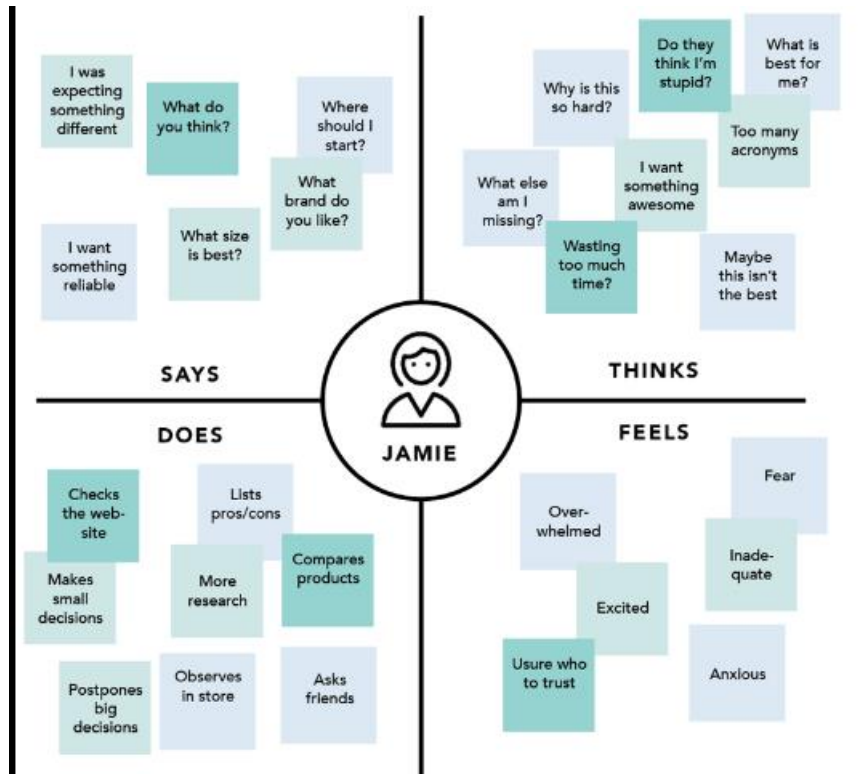


Fig: Empathy Map Canva

3.2 Ideation & Brainstorming

Ideation and Brainstorming are performed to generate ideas and solutions. Brainstorming is a group activity unlike ideation.

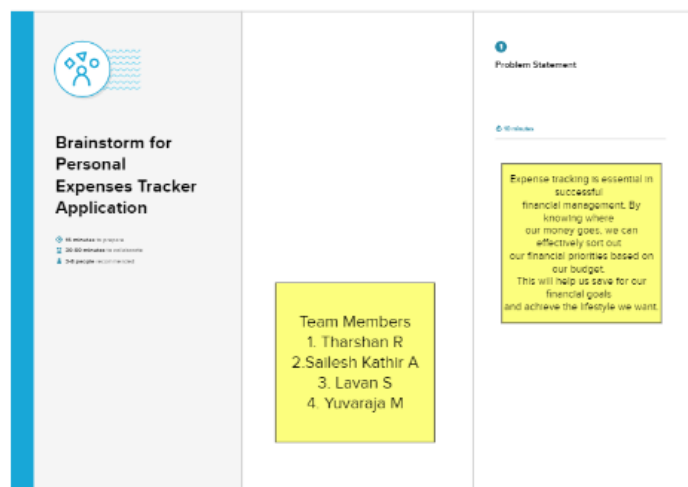


Fig: Problem Statement

2

Brainstorm

⌚ 10 minutes

Tharshan R

- Provide budget Insights
- Integrate email alerting feature
- Track Expense Wallet
- Manage finances efficiently

Sailesh Kathir A

- categorise and disclose business expenses
- Represent expenditure analysis in graphical forms
- Set boundaries on monthly expenses
- Save the taxes

Lavan S

- Import transaction from the Bank Accounts
- calendar view of Income and expenses
- multiple currency support
- receipts storage

Yuvaraja M

- Track household expenses
- plan monthly budget
- Show analytics and saving expenses
- automate budget alerting system

Fig: Brainstorm

3

Group Ideas

⌚ 15 minutes

Group -1

Tharshan R and Sailesh Kathir A

- Provide Budget Insights
- Integrate email Alerting
- Represent expenditure analysis in graphical forms
- categorise and disclose business expenses

Group -2

Lavan S and Yuvaraja M

- Automate budget alerting Feature
- Track Expense wallet
- Set boundaries on monthly expenses
- Save the tax for seasons

Fig: Group Idea

4

Prioritize

🕒 20 minutes

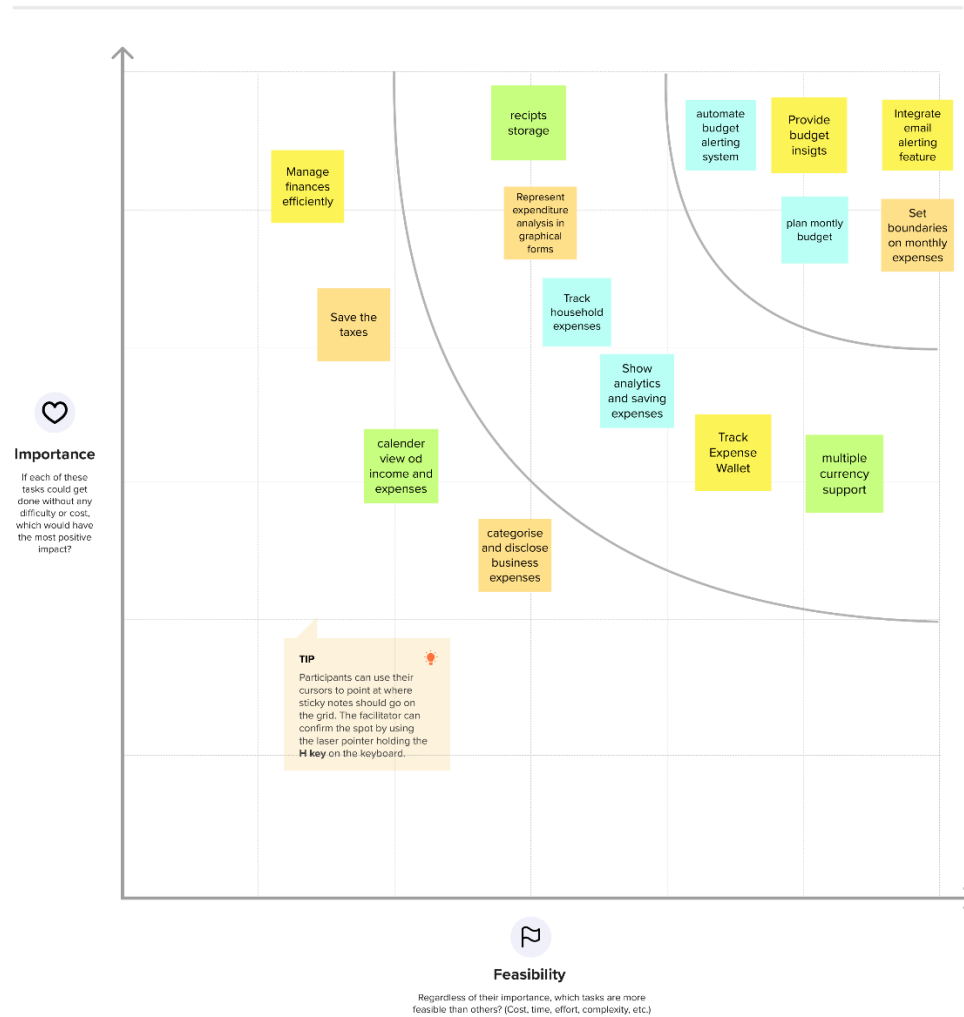


Fig: Priority Chart

3.4 Problem Solution fit

The Problem-Solution Fit means that the solution that is realized can solve the problem that the customer faces

1. CUSTOMER SEGMENTS

- i. Customers are those who spend money without keeping track of it.
- ii. Those who spend money lavishly.
- iii. Provides a whole lot of different categories of expenditure types to avoid mismatch of expenditure

2. JOBS TO BE DONE / PROBLEMS

- i. Expense tracking is essential in successful financial managements. By knowing where our money goes, we can effectively sort out our financial priorities based on our budget. This will help us to save for our financial goals and achieve the lifestyle we want
- ii. The objective of this application is to enable customers to keep track of the expenses.

3. TRIGGERS

- i. Understanding the facts that the customers can save a lot of money by these expense application
- ii. Customer can keep track of their expenses.

4. BENEFITS

- i. They feel a lot of clear about the income and expenses made

5. CUSTOMER CONSTRAINTS

- i. Most of the solution available on the internet hosts a lot of ads limiting its usability.
- ii. The Solution proposed here has a feature to view the expenses graphically.
- iii. Also, it has email alert feature which sends email if the expenses exceed the given limit.

6. AVAILABLE SOLUTION

- i. E-Expense is a mobile application that runs on the android platforms. Using this application users can save their expenses by scanning the bills and the receipts copies. this application is useful only for the android users and it does not provide any graphical representation.

7. BEHAVIOUR

- i. User can save all their expenses.
- ii. Set up a monthly Limit on their Expenses
- iii. It will send an email alert if the expense exceeds the limit
- iv. Keep track of their expense and view expenses in a graphical format for the detailed analysis.

8. CHANNELS OF BEHAVIOUR

- i. Expense Trackers online come with a lot of ads which on clicking steals data.
- ii. Make sure they are ware of the tax rules by reading the available books to make them tax read.

9. ROOT CAUSE

- i. Inability to live a life with scheduled financial expenses thereby falling into debts traps.
- ii. By spending lavishly and not tracking expenses, it's easy to go overboard beyond income
- iii. Frustrated of typing a live a economically balanced life

10. PROPOSED SOLUTION

- i. Design a flask based personal expense tracking application
- ii. Email alert feature which sends expense alerts using the SendGrid.
- iii. An option to view expenses in a graphical format.

3.3 Proposed Solution

S.No	Parameter	Description
1.	Problem Statement	Expense tracking is essential in successful financial management. By knowing where our money goes, we can effectively sort out our financial priorities based on our budget. This will help us save for our financial goals and achieve the lifestyle we want.
2.	Scalability of the Solution	<p>I. The application can be scaled around every earning individual who wants to keep good track of his financial expenses.</p> <p>II. Also, scalability can extend around people working especially in Business sectors</p> <p>III. who pay higher grade of taxes</p> <p>IV.</p>
3.	Idea / Solution description	To develop a personal finance application which allows users to add their expenses and based on their expense wallet balance will be updated and displayed. 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 month and if the limit is exceeded the users will be notified with an email alert.
4.	Novelty / Uniqueness	<p>I. Integration of email alerting system</p> <p>II. Representation of expenditure analysis in graphical forms</p> <p>III. Categorisation and disclosure of business expenses</p> <p>IV. Set boundaries on monthly expenses</p>
5.	Social Impact / Customer Satisfaction	<p>I. Customers can maintain control of their finances and promote better financial habits like saving and investing.</p> <p>II. Customers can regularly track their expense wallet.</p> <p>III. By tracking personal expenses and keeping meticulous records, customers have everything ready come tax time.</p>
6.	Business Model (Revenue Model)	The application can be used in every household where the significance of tracking personal expense is understood thereby serving as a good business model.

4. REQUIREMENT ANALYSIS

4.1 Functional requirements

The suggested solution's functional requirements are listed below.

FR No.	Functional Requirement	Sub Requirement
FR-1	User Registration	This is a form that collects information from the user.
FR-2	Login	User needs to enter their username and password here.
FR-3	Expenses	The user must be able to add their expenses and set limit of their expenses in the application.
FR-4	Expense Tracker	The expenses should be represented graphically.
FR-5	Email Alert	The application sends an email if the expense exceeds the limit.

4.2 Non-Functional requirements

The suggested solution's Non-functional requirements are listed below.

NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	The Application keeps an accurate record of the user's income and expenses.
NFR-2	Security	A detailed accounting of the user's income and expenses.
NFR-3	Performance	Because of lightweight database support, the system's throughput is increased.
NFR-4	Availability	The application must be always completely operational.
NFR-5	Scalability	The application must always function in its entirety.

5. PROJECT DESIGN

5.1 Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within 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 data is stored.

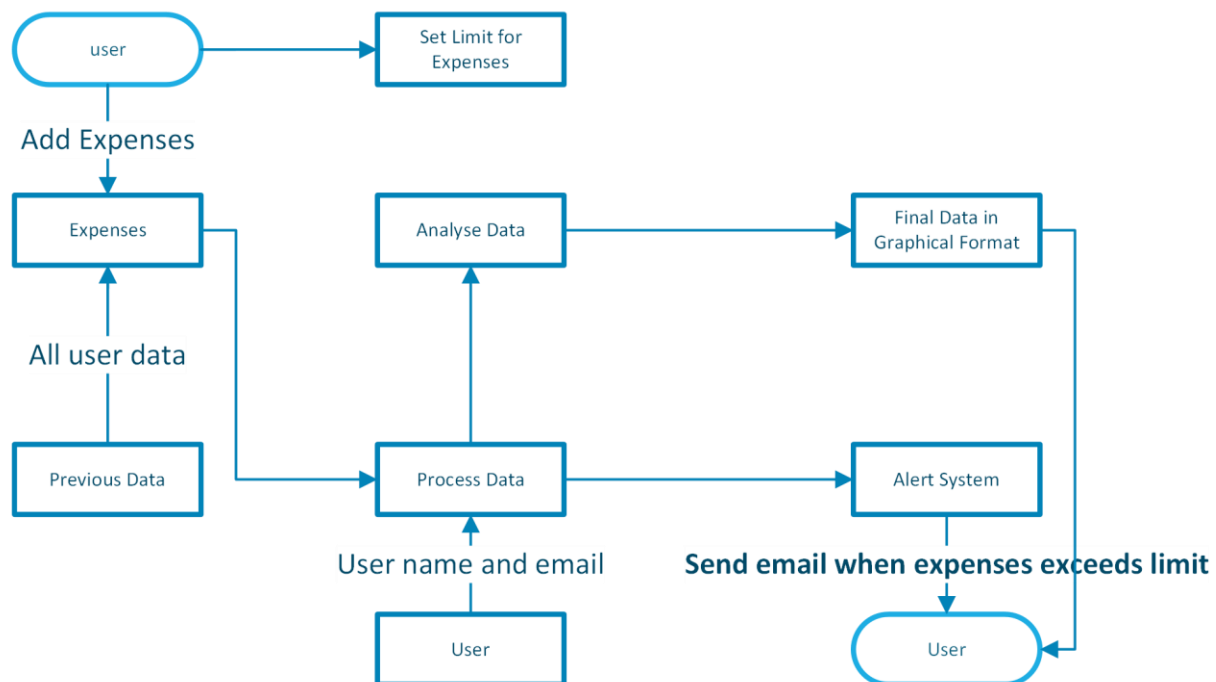


Fig: Data Flow

5.2 Solution and Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2.

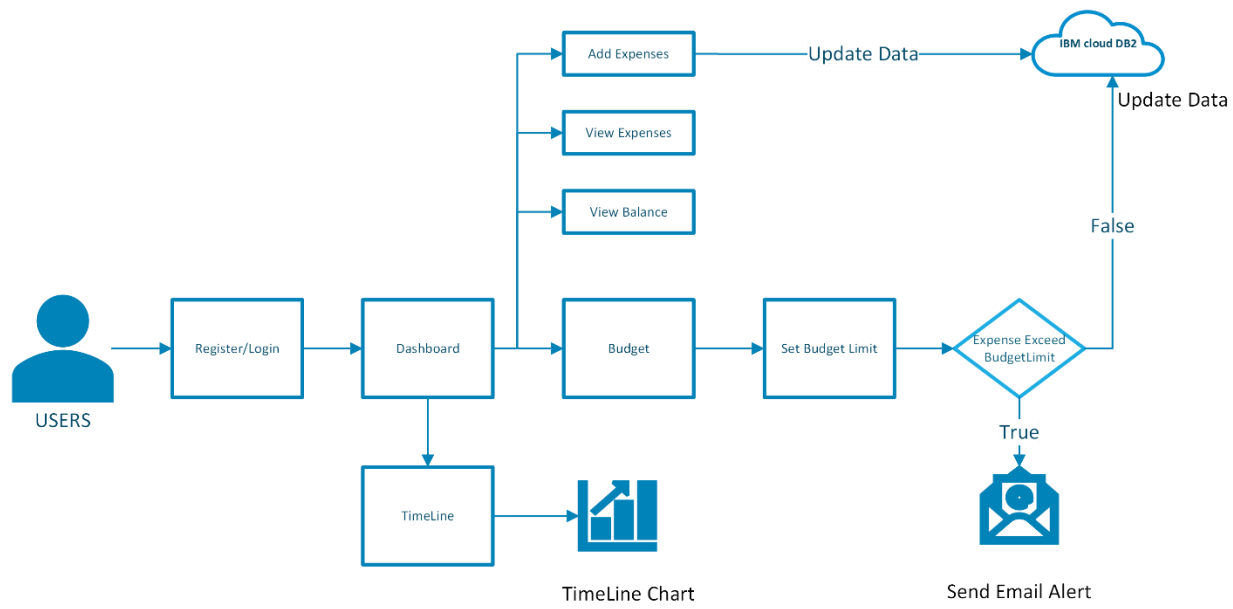


Fig: Solution Architecture

5.3 User Stories

An informal, generic explanation of a software feature written from the viewpoint of the end user is known as a user story. Its objective is to explain how a software feature will benefit the user.

User Type	Functional Requirement (Epic)	User Story / Task	Acceptance criteria
Customer (Mobile user& web user)	Registration	As a user, I can register for the application by entering my email, and password, and confirming my password.	I can access my account/das hboard
		As a user, I will receive a confirmation email once I have registered for the application	I can receive a confirmation email &click confirm
		As a user, I can register for the application through Facebook	I can register & accessthe dashboard with Facebook Login

		As a user, I can register for the application through a Google account.	I can register & access the dashboard with a Google Account login.
	Login	As a user, I can log into the application by entering my email & password	I can access the application.
	Dashboard	As a user, I can see the expenditure details and the daily expense.	I can view the daily expenses and add the expense details.
Customer Care Executive		As a customer care executive, I can solve the problem that customers face.	I can provide support to customers at any time 24*7.
Administrator	Application	As an administrator, I can upgrade or update the application.	I can fix any bugs raised by customers and upgrade the application.

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

The purpose of sprint planning is to define what can be delivered in the sprint and how that work will be achieved. Sprint planning is done in collaboration with the whole team. Use the below template to create product backlog and sprint schedule.

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application
Sprint-2		USN-3	As a user, I can register for the application through Facebook
Sprint-1		USN-4	As a user, I can register for the application through Gmail
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password
Sprint-3	Dashboard	USN-6	As a user, I can view the expenditure details and can add new expenses on the dashboard
Sprint-3	Limits	USN-7	As a user, I can set my monthly expense limit and I will receive an email when the expense exceeds limit
Sprint-4	Reports	USN-8	As a user, I can view the expenditure details in the graphical form

6.2 Sprint Delivery Schedule

Agile sprints typically last from one week to one month. The goal of sprints is to put pressure on teams to innovate and deliver more quickly, hence the shorter the sprint, the better.

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Sprint Release Date(Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	31 Oct 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	07 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	14 Nov 2022

7. CODING & SOLUTIONING

7.1 Feature 1

The user can login with the username and password in the browser page itself, with irrespective to the operating system.

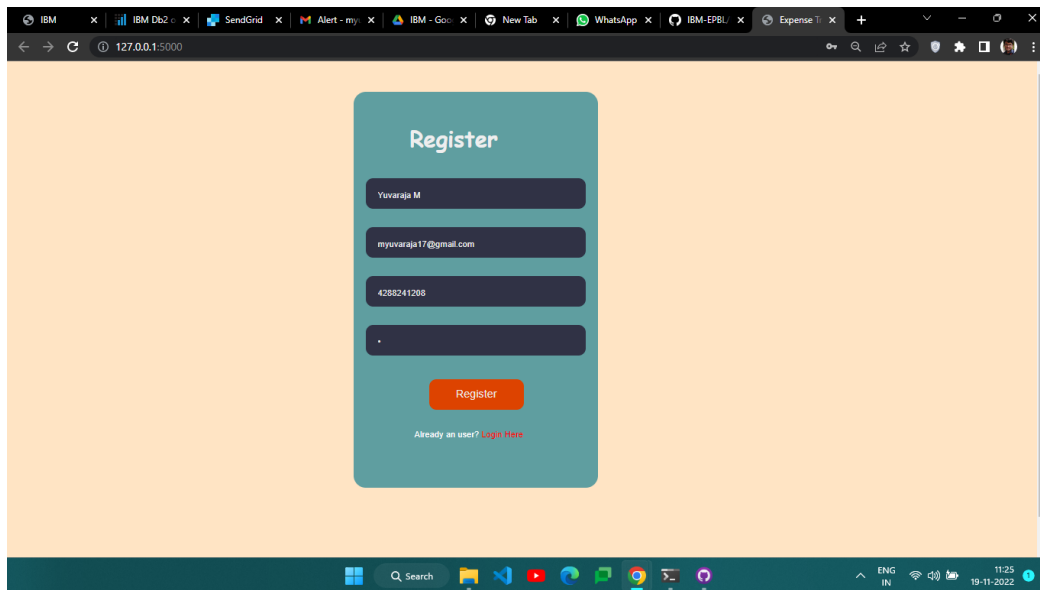


Fig: Signup User Interface

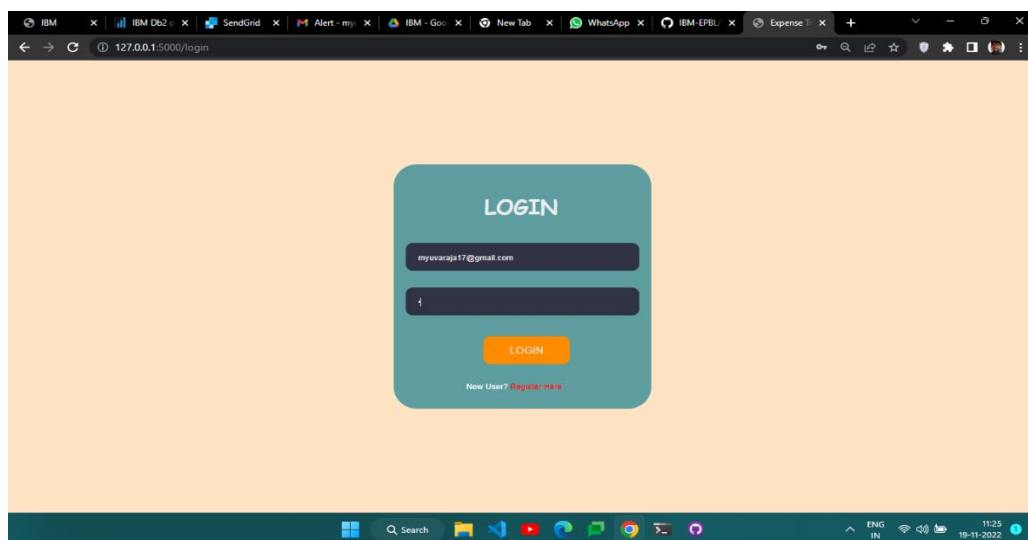


Fig: Login User Interface

7.2 Feature 2

The user can see the expenses with the graphical representation of the same day, month and year.

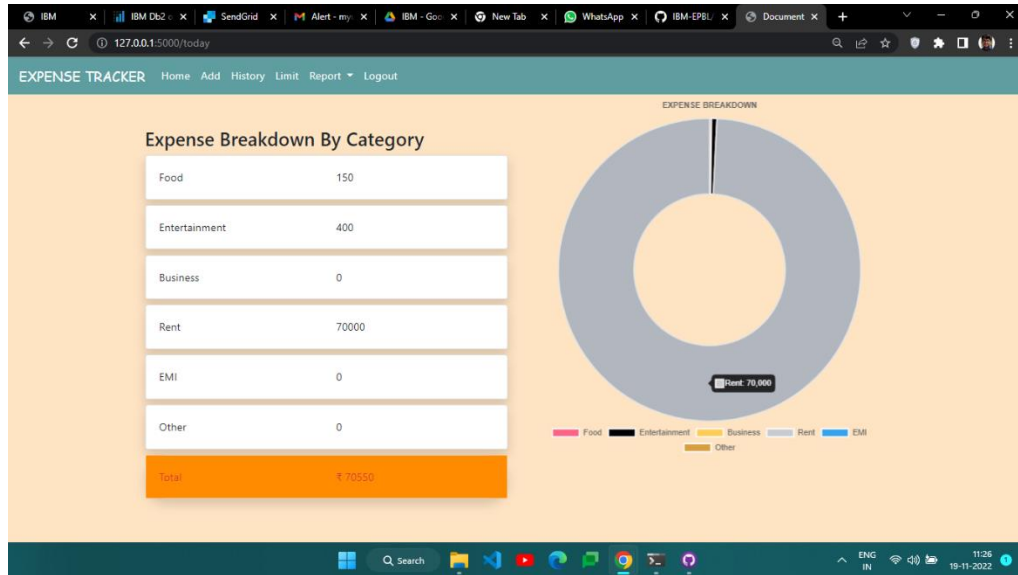


Fig: Current Day Graph User Interface

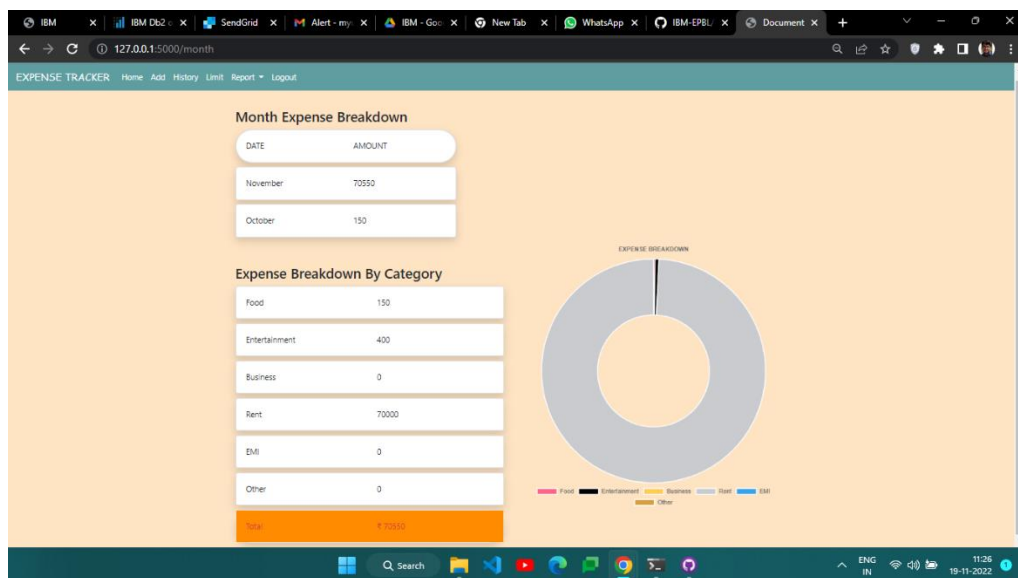
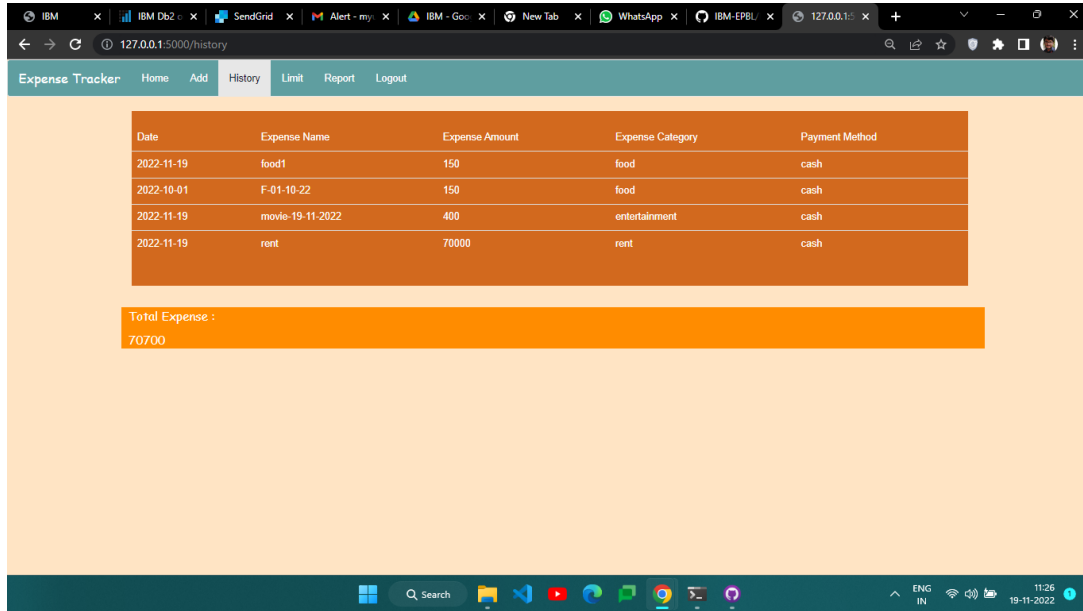


Fig: Monthly Graph User Interface

7.2.1 Feature 2.1

The use can see the expense History from the History Menu.



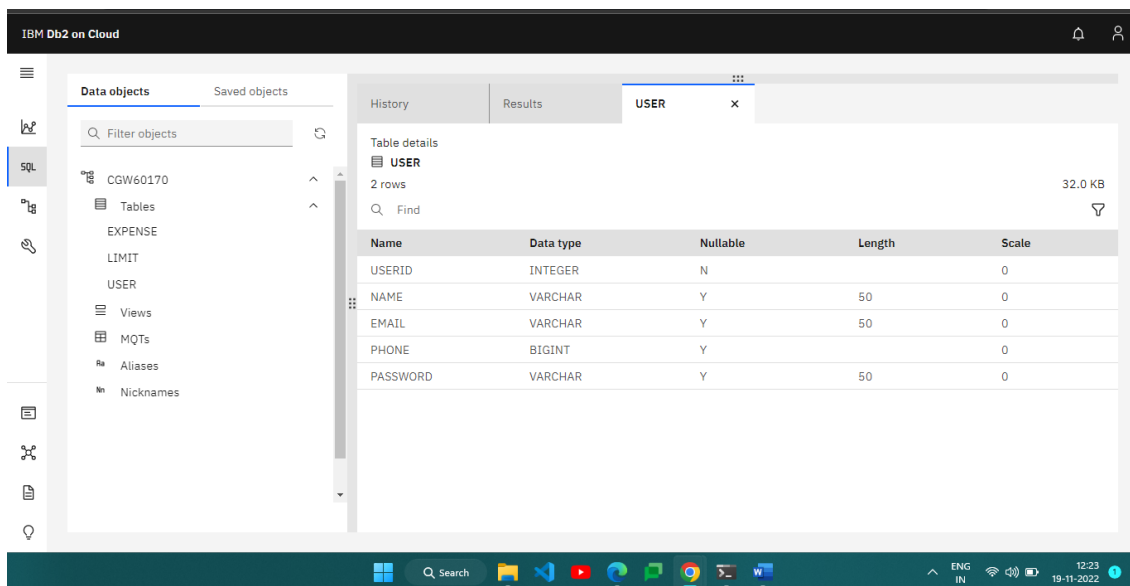
The screenshot shows a web application titled "Expense Tracker" with a navigation menu including Home, Add, History, Limit, Report, and Logout. The "History" tab is active, displaying a table of expense records. Below the table, a summary box shows the "Total Expense : 70700".

Date	Expense Name	Expense Amount	Expense Category	Payment Method
2022-11-19	food1	150	food	cash
2022-10-01	F-01-10-22	150	food	cash
2022-11-19	movie-19-11-2022	400	entertainment	cash
2022-11-19	rent	70000	rent	cash

Total Expense :
70700

Fig: History User Interface

7.3 Database Schema



The screenshot shows the IBM Db2 on Cloud interface. The left sidebar lists "Data objects" including Tables, Views, MQTs, Aliases, and Nicknames. The "USER" table is selected, showing its details: 2 rows, 32.0 KB. The table schema is displayed below.

Name	Data type	Nullable	Length	Scale
USERID	INTEGER	N		0
NAME	VARCHAR	Y	50	0
EMAIL	VARCHAR	Y	50	0
PHONE	BIGINT	Y		0
PASSWORD	VARCHAR	Y	50	0

Fig: User Schema

IBM Db2 on Cloud

Data objects | Saved objects

Filter objects

CGW60170

Tables

EXPENSE

LIMIT

USER

Views

MQTs

Aliases

Nicknames

History | Results | EXPENSE x

Table details

EXPENSE

6 rows

32.0 KB

Find

Name	Data type	Nullable	Length	Scale
USERID	INTEGER	N		0
DATE	DATE	Y	4	0
NAME	VARCHAR	Y	50	0
AMOUNT	INTEGER	Y		0
CATEGORY	VARCHAR	Y	50	0
PAYMENTMETHOD	VARCHAR	Y	50	0

Windows taskbar: Search, File Explorer, Edge, Teams, Word, 12:24 19-11-2022

Fig: Expense Schema

IBM Db2 on Cloud

Data objects | Saved objects

Filter objects

CGW60170

Tables

EXPENSE

LIMIT

USER

Views

MQTs

Aliases

Nicknames

History | Results | LIMIT x

Table details

LIMIT

1 rows

32.0 KB

Find

Name	Data type	Nullable	Length	Scale
USERID	INTEGER	Y		0
AMOUNT	INTEGER	Y		0

Windows taskbar: Search, File Explorer, Edge, Teams, Word, 12:25 19-11-2022

Fig: Limit Schema

8. TESTING

8.1 Test Cases

Test cases are a set of actions performed on a system to determine if it satisfies software requirements and functions correctly as it claimed to perform.

8.2 User Acceptance Testing

Before deploying the software application to a production environment, the end user or client performs a type of testing known as user acceptance testing, or UAT to ensure whether the software functionalities serve the purpose of development.

9. RESULTS

9.1 Performance Metrics

- 9.1.1 Hours Worked : 500 hours
- 9.1.2 Stick to Timelines : 80 %
- 9.1.3 Consistency of the Product : 95%
- 9.1.4 Efficiency of the Product : 98%
- 9.1.5 Quality of the Product : 99.9%

10. ADVANTAGES & DISADVANTAGES

Advantages:

- You can monitor, check your spending and create a budget plan.
- No burden of manual calculations.
- You can control your spendings to set and achieve financial goals.
- It helps you figure out what is happening to your money, and whether you can afford something you want.
- It helps to improve your financial management skills.
- You can track expenses by time, weekly, month, year etc..
- You can be aware what is happening with your money.
- you will be able to work with limited resources and use your money Remember, emergencies come when you least expect. in a wise manner.
- Remember, emergencies come when you least expect. Hence you should have a greater financial management skill.
- Track the expenses monthly, and yearly in terms of summary and pie-charts.
- You can track expenses by categories like food, automobile, entertainment, education etc..

Disadvantages

- User have entry every records manually.
- Your information is less secure, and probably being used and sold.
- Can't able to customized user defined categories
- The category divided may be blunder or messy.

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 expenditures. It will guide them and make them aware of their daily expenses. It will prove to be helpful for people who are frustrated with their daily budget management, irritated because of the number of expenses, and wish to manage money and preserve the record of their daily costs which may be useful to change their way of spending money. In short, this application will help its users to be great at financial management and the cost of their spendings.

12. FUTURE SCOPE

The further enhancements are:

- Users can define their own categories for expense type like food, clothing, rent and bills where they must enter the money that has been spend.
- Alerts for paying dues and remainders to record input at particular user defined time.
- Login with Gmail or social media accounts using Facebook or Twitter.

13. APPENDIX

GitHub Link :

<https://github.com/IBM-EPBL/IBM-Project-27219-1660050866.git>

Project Demonstration Link :

https://drive.google.com/file/d/1Ag92oLYf8kZqITXjcr17Af8S3xZokoWv/view?usp=share_link