

PERSONAL EXPENSE TRACKER APPLICATION

Team ID: PNT2022TMID50562

A PROJECT REPORT

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1. INTRODUCTION

1.1 Project Overview

Personal Expense Tracker

Category: Cloud App Development.

Personal finance entails all the financial decisions and activities that a finance app makes your life easier by helping you to manage your finances efficiently. A personal finance app will help you with budgeting and accounting and give you helpful insights into money management.

Personal finance applications will ask users to add their expenses and based on their expense's wallet balance will be updated which will be visible to the user. Also, users can get an analysis of their expenditures in graphical forms. They have the 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.

1.2 PURPOSE

Personal finance management is an important part of people's lives. However, everyone does not have the knowledge or time to manage their finances properly. And, even if a person has time and knowledge, they do not bother with tracking their expenses as they find it tedious and time-consuming.

Now, you don't have to worry about managing your expenses, as you can access an expense tracker to help manage your finances. Also known as an expense manager and money manager, an expense tracker is a software or application that helps to keep an accurate record of your money inflow and outflow.

Many people in India live on a fixed income, and they find that they don't have sufficient money towards the end of the month to meet their needs. While this problem can arise due to low salary, invariably it is due to poor money management skills.

People tend to overspend without realizing it, which can be disastrous. Using a daily expense manager can help you keep track of how much you spend every day and on what.

At the end of the month, you will have a clear picture of where your money is going. This is one of the best ways to get your expenses under control and bring some semblance of order to your finances.

Today, there are several expense manager applications in the market. Some are paid managers while others are free. Even banks like ICICI offer their customers expense trackers to help them out. Before you go in for a money manager, deciding the type you want is important.

2. LITERATURE SURVEY

2.1 Existing Problem

In a study conducted by Forrester in 2016 surveying small and medium businesses (SMBs) across the world, 56% of companies reported expense management as being the biggest challenge for their finance departments.

In another survey conducted by Level Research in 2018 in North America, respondents reported the following pain points in expense management before adopting automation:

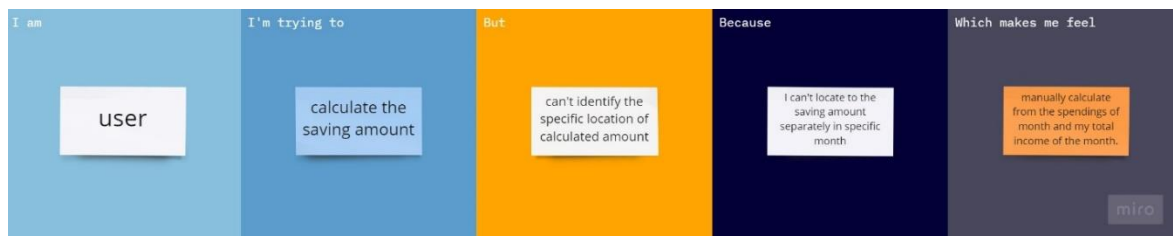
- Manual entry and routing of expense reports (62%)
- Lack of visibility into spending data (42%)
- Inability to enforce travel policies (29%)
- Lost expense reports (24%)
- Lengthy expense approval system and reimbursement cycles (23%)

2.2 References

S.No	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
1.	EXPENSE MANAGER APPLICATION. (2020)	To Develop A Moblie Application That Keeps Record Of User Personal Expenses Contribution In Group Expenditure Top Investment Options View Of The Current Stock Market ,Read Authenticated Financial News	Android Studio	Cloud Application	Advantages: ➤ Keeps Track All Of Your Daily Transactions, Keeps Track Of Your Money Lent Or Borrowed. Disadvantages: ➤ Occupy Lot Of Space.
2.	A NOVEL EXPENSE TRACKER USING STATISTICAL ANALYSIS. (2021)	To Maintain And Manage Data Of Daily Expenditure In A More Precise Way.	SQL Lite	Cloud Application	Advantages: ➤ Its Suggest You With The Most Effective Investment Options. Disadvantages: ➤ The Work Done Being Is Not Accurate.

3.	EXPENSE TRACKER. (2021)	Facilitates The User To Keep Track And Manage Their Personal As Well As Business Expenses.	Android OS	Cloud Application	Advantages: ➤ Become Aware Of Poor Spending Habits And Take Care Of Your Finances Saving And Investment. Disadvantages: ➤ Searching And Referencing Is Difficult And Time-consuming.
4.	EXPENSE TRACKER. (May 2021)	The Application Keeps The Track Of The Income And Expenses Both Of User On A Day To Day Bases	Java	Cloud Application	Advantages: ➤ The Project Effectively Keeps Away From The Manual Figuring. Disadvantages: ➤ Report Generation Is A Tedious Process.

2.3 Problem Statement Definition



All the financial decisions and activities that you make are unable to keep a track of it. This application makes your life easier by helping you to manage your finances efficiently. A personal finance application will help you with budgeting and accounting and give you helpful insights into financial management.

In simple words, personal finance entails all the financial decisions and activities that a Finance app makes your life easier by helping you to manage your finances efficiently.

A personal finance app will help you with budgeting and accounting and give you helpful insights into money management. Personal finance applications will ask users to add their expenses and based on their expense's wallet balance will be updated which will be visible to the user.

Also, users can get an analysis of their expenditures in graphical forms. They have the 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.

1. Who does the problem affect?

The user does not know how to manage their daily expenses manually. Does not have enough knowledge in budget handling. To the person who does not have a limit on spending money. The group that is facing the problem is the users currently facing issues in saving money. Most people would not have made up their minds about how to save money.

2. What are the boundaries of the problem?

A person who is above 16, starts spending money for their needs because below 16 people do not need much money to be spent. Illiterates or people who are not educated much find it difficult to track their expenses. The boundaries will be based on the individual's ratio and also the available applications that are available to choose from and continue for the next few years.

The person should set some boundary values based on the income for each expenditure. This way the boundaries extend to effectively manage the expenses.

3. What is the issue?

The people who are struggling to find a better way to manage their expenses are the major issue and the problem that requires a better solution that should include the issues that are left out by the most available solutions in day-to-day life. The project should find the user's ability to admit to the desired money management for the savings that they have earned.

The impact that the issue makes current days is that there is huge confusion about getting a good application that is available. The failure is unable to get a suitable expense tracker makes the users lose hope and unwillingly buy products in EMI rather than the ones they had wished to carry.

This impact makes the lose their mental stability and puts them under a lot of pressure of being unable to find a better way to save money. This has been in a state of not being able to fully recover from the problem that is quite been there for more than a decade. There are solutions to overcome this issue but, every solution that has been developed towards this had a flaw in any one of the things that are present in their ideas.

This issue needs a complete fix that is by analysing the expenses to that of the income-expenditure that is been spent by the users. This way the issue gets slowly fixed and the users will not have any issues in setting their limits for spending money daily or monthly or sometimes losing them based on the unwanted expenditure.

The issue will be continuing to persist even if the project has been implemented. But still, the users will be even more cautious in selecting the right Personal expense application. Users if the issue is not solved then we will be suffering to find the expense tracker as it was before. So, the issue needs to be maintained at the earliest so that the users can concentrate on their day-to-day expenses and savings instead of searching for other ways.

4. When does the issue occur?

An issue occurs in expense tracking when there is a lack of control over the day-to-day expenses. The absence of clearly defined spending limits is one of the biggest frustrations when overseeing a person's expense management process.

There are expenses you cannot avoid. If you use the 50/30/20 budget, these should account for 50% of your spending. Necessities often include the following:

- Healthcare: Health insurance; out-of-pocket medical costs.
- Life insurance
- Child care
- Student loan payment

5. Where is the issue occurring?

The issue occurs when the user does not keep track of their expenses and day-to-day expenditures. For instance, if the user does not have enough money in his/her account or wallet, but tends to buy products beyond the budget list (buying unnecessary products/materials/things unknowingly), he might end up in trouble and disappointed.

So, in this situation, this personal expense tracker application will help the users by sending notifications on a timely basis.

Some of the necessities that cannot avoid:

- Housing: Mortgage or rent
- Transportation: Car payment, gas, maintenance, and auto insurance.
- Utilities: Electricity, water, cell phone bills.

6. Why is it important that we fix the problem?

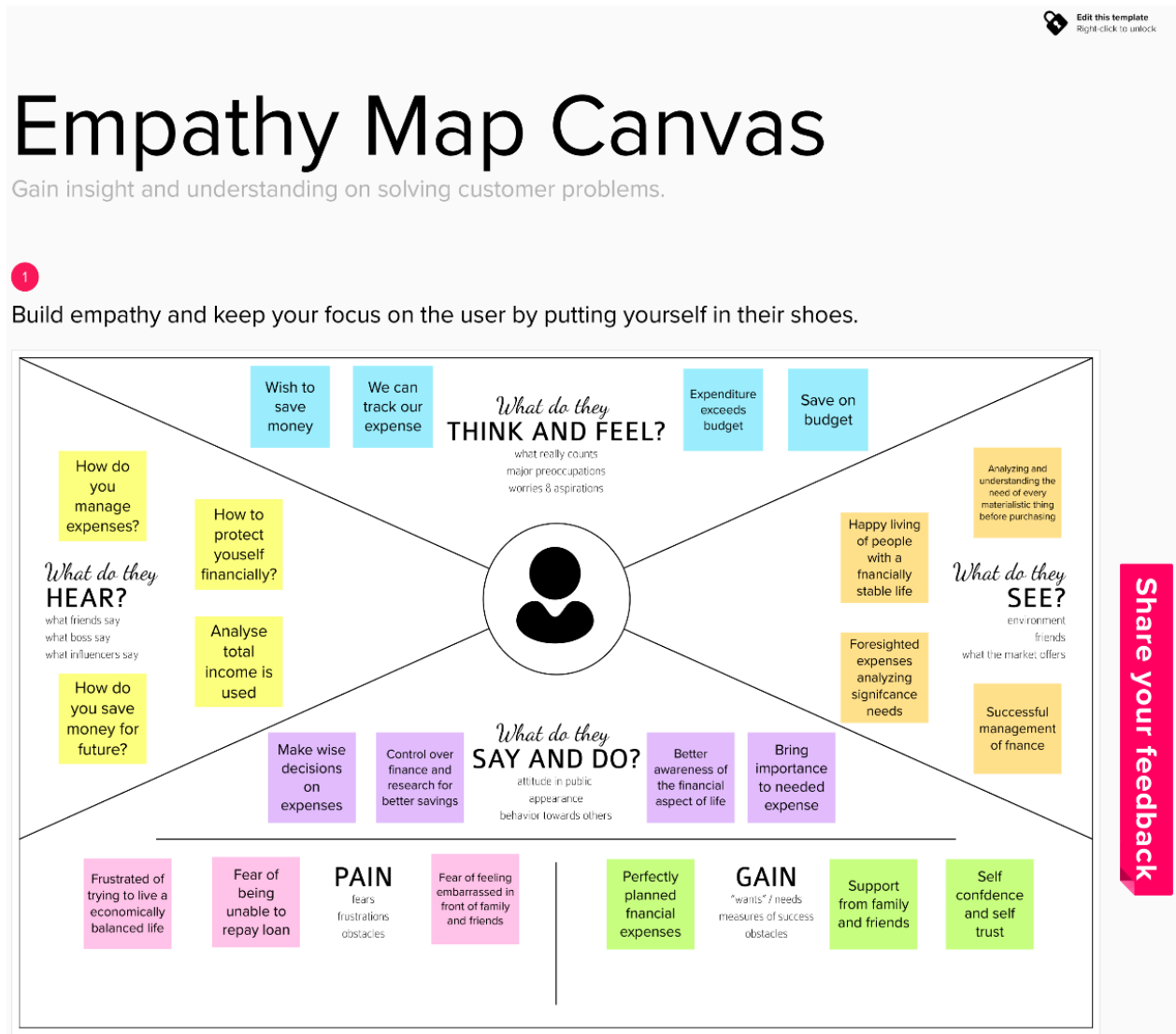
When you track your spending, you know where your money goes and you can ensure that your money is used wisely. Tracking your expenditures also allows you to understand why you're in debt and how you got there. This will then help you design a befitting strategy for getting out of debt.

The main reason you should track your expenses is to identify and eliminate wasteful spending habits in your financial life. Moreover, consistently tracking your expenses will help you maintain control of your finances, and promote better financial habits like saving and investing.

When you start tracking expenses, you can separate your spending into three categories: needs, wants, and savings. Tracking your spending regularly can give you an accurate picture of where your money is going – and where you should like it to go instead.

3. IDEATION & PROPOSED SOLUTION


3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming

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

Template



Brainstorm & idea prioritization

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

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

[Share template feedback](#)

➔

Before you collaborate

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

⌚ 10 minutes

A

Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) ➔

1

Define your problem statement

Making the website works on every platform and every device with the feature of responsive in nature. Bring the best experience from the user side with keep tracking of expenses.

⌚ 5 minutes

problem

How might we [your problem statement]?

🧠

Key rules of brainstorming

To run an smooth and productive session

🕒 Stay in topic.

💡 Encourage wild ideas.

🕒 Defer judgment.

👂 Listen to others.

🗣️ Go for volume.

👁️ If possible, be visual.

Step 2: Brainstorm, Idea Listing, and Grouping

2

Brainstorm

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

⌚ 10 minutes

Nanthakumar

Allocate money to different peripherals

Track your expenses regularly

Improve efficiency

Track operations expenses

Set spending limits

Avoid budget overruns

Help users to take care of their expenses

Make it easy to track budget and control their spending

Put you in control of your finances

Praveen

Don't use your productivity

Be in control of your business

Accumulate money from and outside

Don't use your productivity

Be in control of your business

Accumulate money from and outside

Don't use your productivity

Be in control of your business

Accumulate money from and outside

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is larger than six sticky notes, try condense it or split it up into smaller sub-groups.

⌚ 20 minutes

Notify Over Spendings

Analyze Budge

GROUP IDEAS

Prevent Data Loss

Protect Data

More Responsive

Make Nice Looking UI

Make insights easy

Graphical Representation

📌

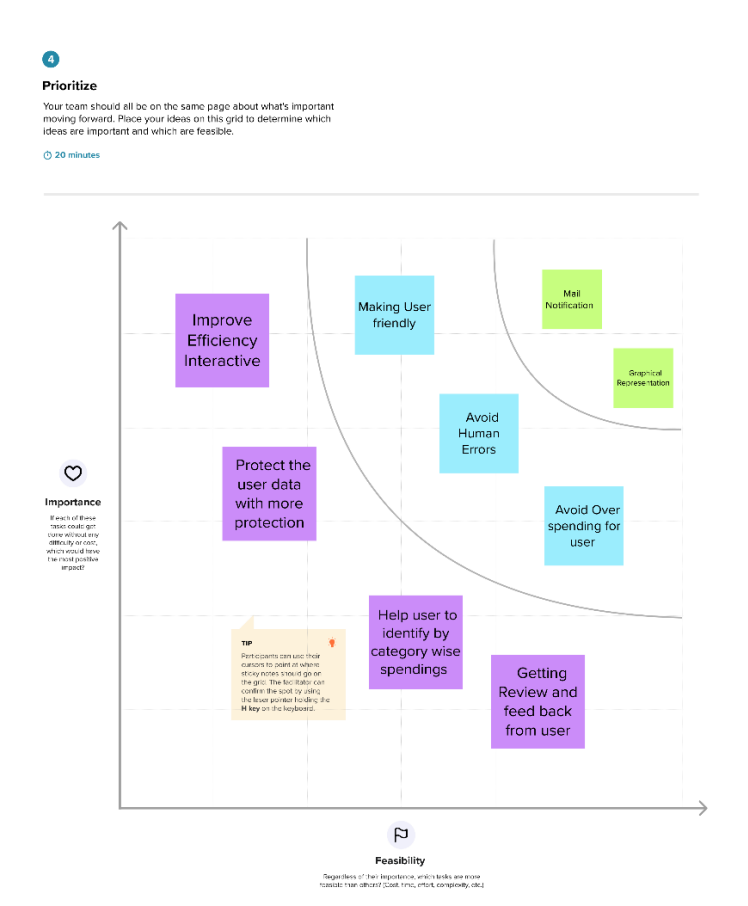
Don't use your productivity

Be in control of your business

Accumulate money from and outside

12

Step-3: Idea Prioritization



3.3 Proposed Solution

S. No	Parameter	Description
1	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"> To digitalize the records of the expenses of the user. Generally, people are not aware of some of the expenses and end up in debt.
2	Idea / Solution Description	<ul style="list-style-type: none"> An application is designed to monitor income and manage expenses. The income and the expense can be represented in a graphical manner.

3	Novelty / Uniqueness	<ul style="list-style-type: none"> An alert can be sent to the user if the expense is reached the threshold limit. A notification will be sent to the user if the user didn't enter the data for a particular period.
4	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> The user can keep track of the expense and manage the money accordingly. The users can refer to the expense and balance amount anytime they want by their phone.
5	Business Model (Revenue Model)	<ul style="list-style-type: none"> In-app advertisements will generate revenue. Users can use our application without advertisement by subscribing to our premium plans.
6	Scalability of the Solution	<ul style="list-style-type: none"> A large number of users can be handled in our application. The scalability can be easily achieved since we using cloud technology.

3.4 Problem Solution fit

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) <ul style="list-style-type: none">• Working Individuals• Students• Budget conscious consumers	6. CUSTOMER CONSTRAINTS <ul style="list-style-type: none">• Internet Access• Device (Smartphone) to access the application• Data Privacy• Cost of existing applications• Trust	5. AVAILABLE SOLUTIONS <ul style="list-style-type: none">• Expense Diary or Excel sheet <p>PROS : Have to make a note daily which helps to be constantly aware</p> <p>CONS : Inconvenient, takes a lot of time</p>						
	2. JOBS-TO-BE-DONE / PROBLEMS <ul style="list-style-type: none">• To keep track of money lent or borrowed• To keep track of daily transactions• Alert when a threshold limit is reached	9. PROBLEM ROOT CAUSE <ul style="list-style-type: none">• Reckless spendings• Indecisive about the finances• Procrastination• Difficult to maintain a note of daily spendings (Traditional methods like diary)	7. BEHAVIOUR <ul style="list-style-type: none">• Make a note of the expenses on a regular basis.• Completely reduce spendings or spend all of the savings• Make use of online tools to interpret monthly expense patterns						
Identify strong TR & EM	3. TRIGGERS <ul style="list-style-type: none">• Excessive spending• No money in case of emergency	10. YOUR SOLUTION <p>Creating an application to manage the expenses of an individual in an efficient and manageable manner, as compared to traditional methods</p>	8. CHANNELS OF BEHAVIOUR <p>ONLINE</p> <p>Maintain excel sheets and use visualizing tools</p>						
	4. EMOTIONS <table><tr><td>BEFORE</td><td>AFTER</td></tr><tr><td>• Anxious</td><td>• Confident</td></tr><tr><td>• Confused</td><td>• Composed</td></tr><tr><td>• Fear</td><td>• Calm</td></tr></table>		BEFORE	AFTER	• Anxious	• Confident	• Confused	• Composed	• Fear
BEFORE	AFTER								
• Anxious	• Confident								
• Confused	• Composed								
• Fear	• Calm								

4. REQUIREMENT ANALYSIS

4.1 Functional Requirements:

Following are the functional requirements of the proposed solution.

FR	Functional Requirements (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration via g-mail or phone number
FR-2	User Confirmation	<ul style="list-style-type: none">• Confirmation via OTP• Confirmation via g-mail
FR-3	Tracking of expenses	The user can keep track of his/her expenses
FR-4	Notify of recurring expenses	The user gets a notification for his/her monthly recurring expenses
FR-5	Recommend investment ideas	Recommending ideas based on their expenses, salary, etc.
FR-6	Alert on overspending	It gives an alert message if the user spends more than his budget.

4.2 Non-Functional Requirements:

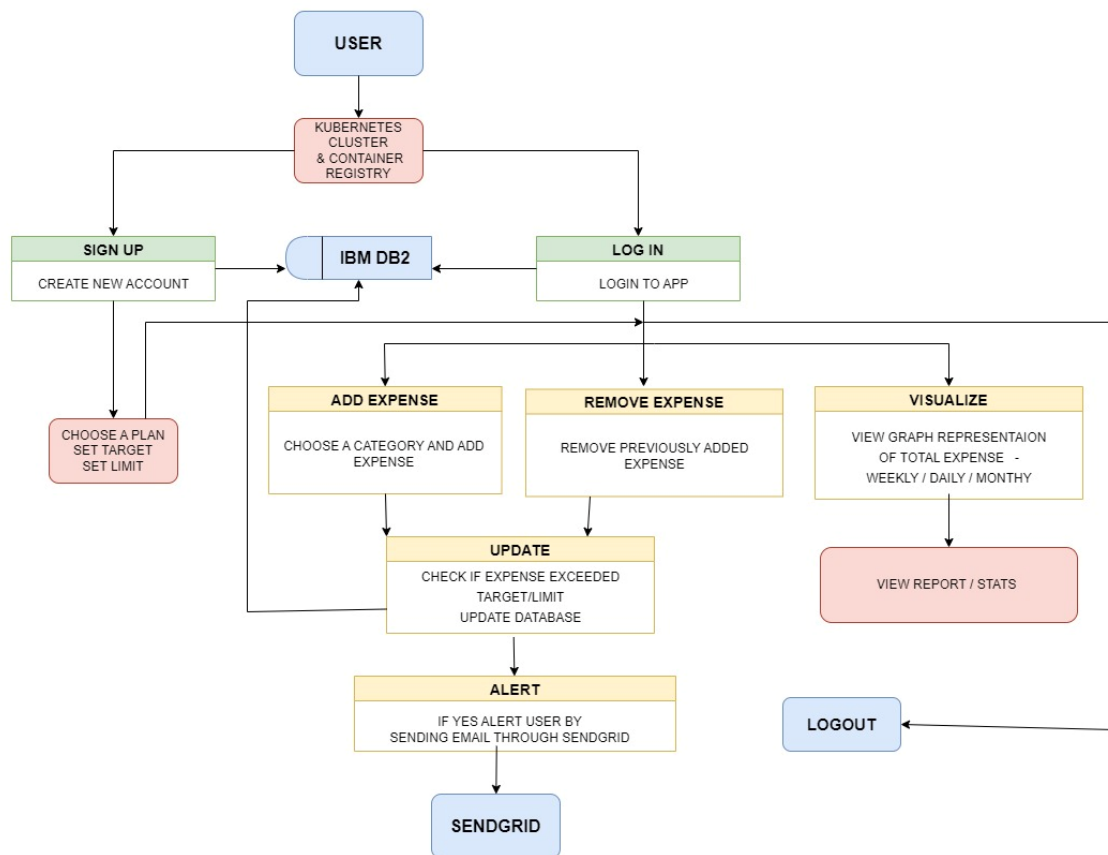
Following are the non-functional requirements of the proposed solution.

NFR	Non-Functional Requirements	Description
NFR-1	Usability	It is very user-friendly since they can easily store their expense details.
NFR-2	Security	It can be accessed only by the authorized user with the registered login credentials.

NFR-3	Reliability	The user can keep track of his/her expenses
NFR-4	Performance	The system performs well in reporting the expenses, reminders, alerts, etc.
NFR-5	Availability	The expense tracker application can be accessed at any time.
NFR-6	Scalability	The application will have a data backup mechanism.

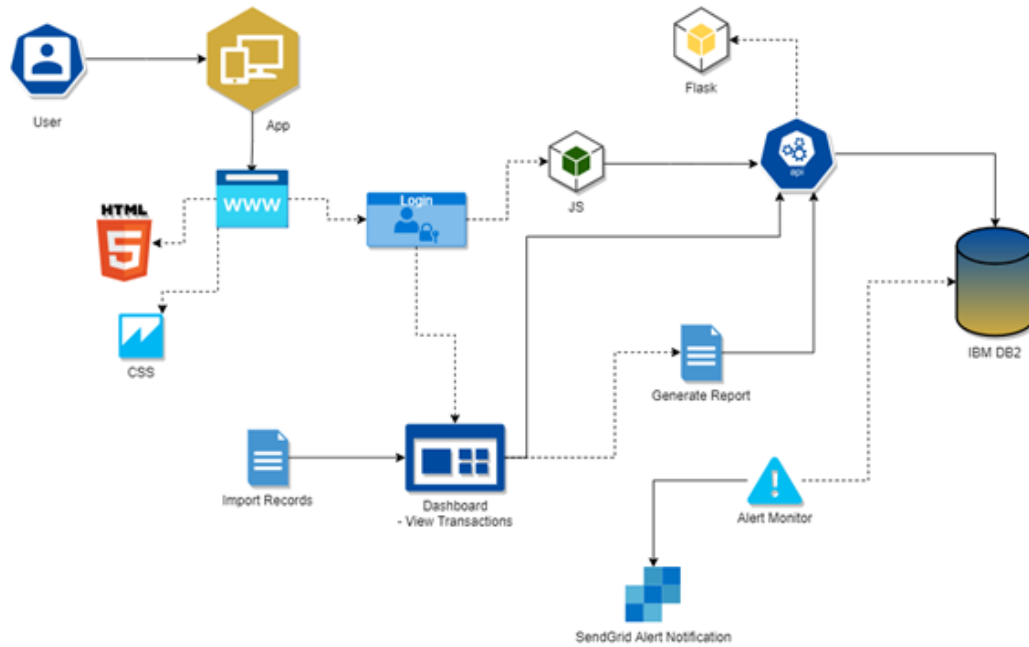
5. PROJECT DESIGN

5.1 Data Flow Diagrams

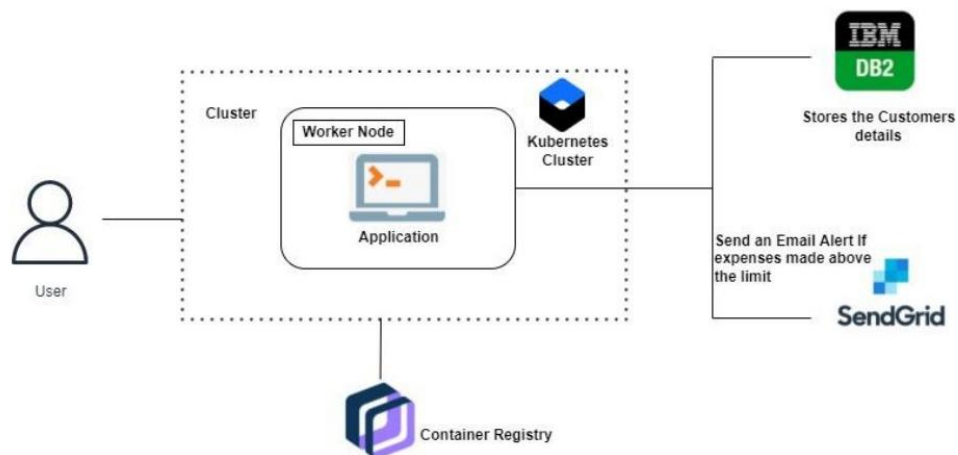


5.2 Solution & Technical Architecture

Solution Architecture:



Technical Architecture:



5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, and password, and confirming my password.
	Login	USN-2	As a user, I can log into the application by entering my email & password.
	Add	USN -3	As a user, I can add in new expenses.
	Remove	USN – 4	As a user, I can remove previously added expenses.
	View	USN - 5	As a user, I can view my expenses in the form of graphs and get insights.
	Get alert message	USN - 6	As a user, I will get alert messages if I exceed my target amount.
Administrator	Add/remove user	USN – 7	As an admin, I can add or remove user details on db2 manually.
		USN - 8	As an admin, I can add or remove user details on SendGrid.

6. PROJECT PLANNING & SCHEDULING

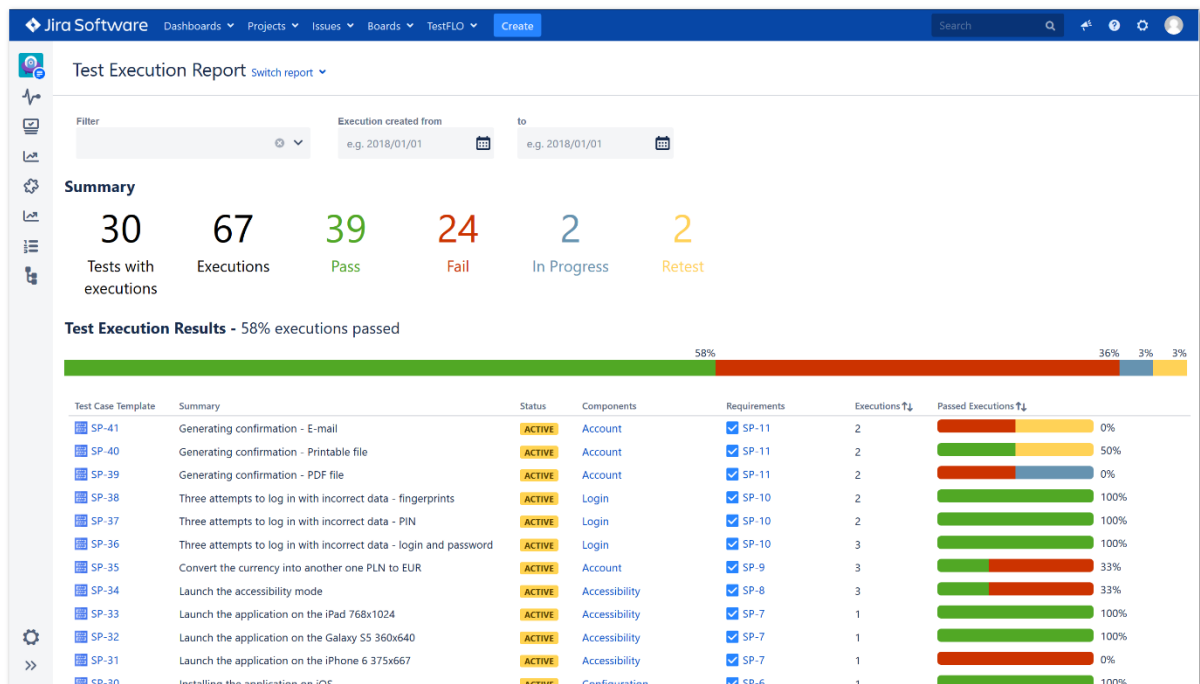
6.1 Sprint Planning & Estimation

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, and password, and confirming my password.	2	High	NanthaKumar
		USN 2	As a user, I will receive a confirmation email once I have registered for the application	1	High	Nafil Arzzam
	Login	USN 3	As a user, I can log into the application by entering my email & password	2	High	Praveen
	Registration	USN 4	Logging in takes to the dashboard for the logged user.	1	High	Christopher Raj

6.2 Sprint Delivery Schedule

Sprint	Story Points	Duration	Start Date	End Date	Story Points complete	Sprint Release Date
Sprint 1	20	6 Days	23 Oct 2022	28 Oct 2022	20	29 Oct 2022
Sprint 2	20	6 Days	30 Oct 2022	04 Nov 2022	20	05 Nov 2022
Sprint 3	20	6 Days	06 Nov 2022	11 Nov 2022	20	12 Nov 2022
Sprint 4	20	6 Days	13 Nov 2022	18 Nov 2022	20	19 Nov 2022

6.3 Reports from Jira



7. CODING & SOLUTIONING

7.1 Feature 1

- **Feature 1:** Add Expense
- **Feature 2:** Update expense
- **Feature 3:** Delete Expense
- **Feature 4:** Set Limit
- **Feature 5:** Send Alert Emails to users

7.2 Feature 2

- 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 then saving in the app.
- Approval of bills and expenditures in real-time and get notified instantly.
- Quick settlement of claims and reduced human errors with an automated and streamlined billing process.

8. TESTING

8.1 TEST CASES

- Login Page (Functional)
- Login Page (UI)
- Add Expense Page (Functional)

8.2 USER ACCEPTANCE TESTING

1. Purpose of the document

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

2. Defect Analysis

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

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 Performance Metrics

- **Tracking income and expenses:** Monitoring the income and tracking all expenditures (through bank accounts, mobile wallets, and credit & debit cards).
- **Transaction Receipts:** Capture and organize your payment receipts to keep track of your expenditure.
- **Organizing Taxes:** Import your documents to the expense tracking app, and it will streamline your income and expenses under the appropriate tax categories.
- **Payments & Invoices:** Accept and pay from credit cards, debit cards, net banking, mobile wallets, and bank transfers, and track the status of your invoices and bills in the mobile app itself. Also, the tracking app sends reminders for payments and automatically matches the payments with invoices.
- **Reports:** The expense tracking app generates and sends reports to give a detailed insight about profits, losses, budgets, income, balance sheets, etc.,
- **E-commerce integration:** Integrate your expense tracking app with your eCommerce store and track your sales through payments received via multiple payment methods.
- **Vendors and Contractors:** Manage and track all the payments to the vendors and contractors added to the mobile app.
- **Access control:** Increase your team productivity by providing access control to particular users through custom permissions.
- **Track Projects:** Determine project profitability by tracking labor costs, payroll, expenses, etc., of your ongoing project.

- **Inventory tracking:** An expense tracking app can do it all. Right from tracking products or the cost of goods, sending alert notifications when the product is running out of stock or the product is not selling, to purchase orders.
- **In-depth insights and analytics:** Provide in-built tools to generate reports with easy-to-understand visuals and graphics to gain insights about the performance of your business.
- **Recurrent Expenses:** Rely on your budgeting app to track, streamline, and automate all the recurrent expenses and remind you on a timely basis.

10. ADVANTAGES AND DISADVANTAGES

Advantages:

One of the major pros of tracking spending is always being aware of the state of one's finances. Tracking what you spend can help you stick to your budget, not just in a general way, but in each category such as housing, food, transportation, and gifts.

While a con is that manually tracking all cash that is spent can be irritating as well as time-consuming, a pro is that doing this automatically can be quick and simple.

Another pro is that many automatic spending-tracking software programs are available for free.

Having the program on a hand-held device can be a main pro since it can be checked before spending occurs to be sure of the available budget.

Another pro is that for those who just wish to keep tracking spending by hand with paper and pen or by entering data onto a computer spreadsheet, these options are also available.

Some people like to keep a file folder or box to store receipts and record the cash spent each day. A pro of this simple daily tracking system is that it can make one more aware of where the money is going way before the end of a pay period or month.

Disadvantages:

A con with any system used to track spending is that one may start doing it and then taper off until it's forgotten about altogether. 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 each 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

- Achieve your business goals with a tailored mobile app that perfectly fits your business.
- Scale up at the pace your business is growing.
- Deliver an outstanding customer experience through additional control over the app.
- Control the security of our business and customer data.
- Open direct marketing channels with no extra costs with methods such as push notifications.
- Boost the productivity of all the processes within the organization.
- Increase efficiency and customer satisfaction with an app aligned to their needs.
- Seamlessly integrate with existing infrastructure.
- Ability to provide valuable insights.
- Optimize sales processes to generate more revenue through enhanced data collection.
- Robo Advisors: Get expert investment advice and solutions with the Robo Advisor's feature. This feature will analyze, monitor, optimize, and improve diversification in investments by turning data into actionable insights in real time.

13. APPENDIX

13.1 Source Code

```
from flask import Flask, render_template, request, redirect, session
import re
import os
import ibm_db
from sendemail import sendgridmail, sendmail

app = Flask(__name__)

app.secret_key = '0238c80c2f52f538bbe10149e6064623edea389fd9ceedc6febb9be1eb7503a4'

ibm_db_conn = ibm_db.connect(
    f"DATABASE={os.environ.get('DB_NAME')});"
    f"HOSTNAME={os.environ.get('DB_HOST')});"
    f"PORT={os.environ.get('DB_PORT')});"
    f"USERNAME={os.environ.get('DB_USERNAME')});"
    f"PASSWORD={os.environ.get('DB_PASSWORD')});"
    "SECURITY=SSL;"
    f"SSLSERVERCERTIFICATE={os.environ.get('DB_SSLCERT')});",
    '',
    ''
)

# HOME--PAGE
@app.route("/home")
def home():
    return render_template("homepage.html")

@app.route("/")
def add():
    return render_template("home.html")

# SIGN--UP--OR--REGISTER
@app.route("/signup")
def signup():
    return render_template("signup.html")
```

```

@app.route('/register', methods=['GET', 'POST'])
def register():
    msg = ''
    if request.method == 'POST':
        username = request.form['username']
        email = request.form['email']
        password = request.form['password']

        sql = "SELECT * FROM register WHERE username = ?"
        stmt = ibm_db.prepare(ibm_db_conn, sql)
        ibm_db.bind_param(stmt, 1, username)
        ibm_db.execute(stmt)
        result = ibm_db.execute(stmt)
        account = ibm_db.fetch_row(stmt)

        param = "SELECT * FROM register WHERE username = " + "\"" + username + "\""
        res = ibm_db.exec_immediate(ibm_db_conn, param)
        dictionary = ibm_db.fetch_assoc(res)
        while dictionary != False:
            dictionary = ibm_db.fetch_assoc(res)

        if account:
            msg = 'Username already exists !'
        elif not re.match(r'^@+@[^@]+\.[^@]+', email):
            msg = 'Invalid email address !'
        elif not re.match(r'[A-Za-z0-9]+', username):
            msg = 'name must contain only characters and numbers !'
        else:
            sql2 = "INSERT INTO register (username, email,password) VALUES (?, ?, ?)"
            stmt2 = ibm_db.prepare(ibm_db_conn, sql2)
            ibm_db.bind_param(stmt2, 1, username)
            ibm_db.bind_param(stmt2, 2, email)
            ibm_db.bind_param(stmt2, 3, password)
            ibm_db.execute(stmt2)
            msg = 'You have successfully registered !'
        return render_template('signup.html', msg=msg)

```

```

# delete---the--data
@app.route('/delete/<string:id>', methods=['POST', 'GET'])
def delete(id):
    param = "DELETE FROM expenses WHERE id = " + id
    res = ibm_db.exec_immediate(ibm_db_conn, param)
    return redirect("/display")

# UPDATE---DATA
@app.route('/edit/<id>', methods=['POST', 'GET'])
def edit(id):
    param = "SELECT * FROM expenses WHERE id = " + id
    res = ibm_db.exec_immediate(ibm_db_conn, param)
    dictionary = ibm_db.fetch_assoc(res)
    row = []
    while dictionary != False:
        temp = []
        temp.append(dictionary["ID"])
        temp.append(dictionary["USERID"])
        temp.append(dictionary["DATE"])
        temp.append(dictionary["EXPENSENAME"])
        temp.append(dictionary["AMOUNT"])
        temp.append(dictionary["PAYMODE"])
        temp.append(dictionary["CATEGORY"])
        row.append(temp)
        dictionary = ibm_db.fetch_assoc(res)

    return render_template('edit.html', expenses=row[0])

```

```

@app.route('/update/<id>', methods=['POST'])
def update(id):
    if request.method == 'POST':
        date = request.form['date']
        expensename = request.form['expensename']
        amount = request.form['amount']
        paymode = request.form['paymode']
        category = request.form['category']

        p1 = date[0:10]
        p2 = date[11:13]
        p3 = date[14:]
        p4 = p1 + "-" + p2 + "." + p3 + ".00"

        sql = "UPDATE expenses SET date = ? , expensename = ? , amount = ?, paymode = ?"
        stmt = ibm_db.prepare(ibm_db_conn, sql)
        ibm_db.bind_param(stmt, 1, p4)
        ibm_db.bind_param(stmt, 2, expensename)
        ibm_db.bind_param(stmt, 3, amount)
        ibm_db.bind_param(stmt, 4, paymode)
        ibm_db.bind_param(stmt, 5, category)
        ibm_db.bind_param(stmt, 6, id)
        ibm_db.execute(stmt)

        return redirect("/display")

# limit
@app.route("/limit")
def limit():
    return redirect('/limitn')

```

```

@app.route("/limitnum", methods=['POST'])
def limitnum():
    if request.method == "POST":
        number = request.form['number']

        sql = "INSERT INTO limits (userid, limitss) VALUES (?, ?)"
        stmt = ibm_db.prepare(ibm_db_conn, sql)
        ibm_db.bind_param(stmt, 1, session['id'])
        ibm_db.bind_param(stmt, 2, number)
        ibm_db.execute(stmt)

        return redirect('/limitn')

@app.route("/limitn")
def limitn():
    param = "SELECT id, limitss FROM limits WHERE userid = " + str(
        session['id']) + " ORDER BY id DESC LIMIT 1"
    res = ibm_db.exec_immediate(ibm_db_conn, param)
    dictionary = ibm_db.fetch_assoc(res)
    row = []
    s = " /-"
    while dictionary != False:
        temp = []
        temp.append(dictionary["LIMITSS"])
        row.append(temp)
        dictionary = ibm_db.fetch_assoc(res)
        s = temp[0]

    return render_template("limit.html", y=s)

```

13.2 GitHub & Project Demo Link

Complete Source: <https://github.com/IBM-EPBL/IBM-Project-47799-1660802348/tree/main/Final%20Deliverables/src>

Demo Link: <https://github.com/IBM-EPBL/IBM-Project-47799-1660802348/blob/main/Final%20Deliverables/DemoVideo.mp4>

Repo Link: <https://github.com/IBM-EPBL/IBM-Project-47799-1660802348>