

Personal Expense Tracker Application

PROJECT REPORT

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in partial fulfillment for the award of the degree

of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

RAJALAKSHMI INSTITUTE OF TECHNOLOGY

ANNA UNIVERSITY: CHENNAI 600 025

NOVEMBER 2022

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INTRODUCTION

1.1 Project Overview:

Personal Expense Tracker is a daily expense management system which is specially designed for non- salaried and salaried personnel for keeping track of their daily expenditure with easy and effective way through computerized system which tends to eliminate manual paper works. It will also manage records in systematic way and user can access the stored data conveniently. We have tried to design the project in such way that user may not have any difficulty in using this application without much effort. This software can be really used by end user who has stable internet . The language that we use to develop this system is flask using python and IBM Db2 for database.

1.2 Purpose:

The idea of developing this project for user convenience. Because whenever they make expenses immediately, they add in the application. Some of the concerns maintaining a personal expense is a BIG problem, in daily expenses many times we don't know where the money goes. Some of the conventional methods used to tackle this problem in normal circumstances are like making use of a sticky notes by common users, Proficient people deals with this kind of problems by using spreadsheets to record expense and using a ledger to maintains the large amounts data by especially by expert people. We believe a handy design and a handy mobile application which handles these troubles. Such that app is capable of recording the expenditure and giving broad view with easy to use the user interface and this application is intelligent enough to shows the history of expenses.

LITERATURE SURVEY

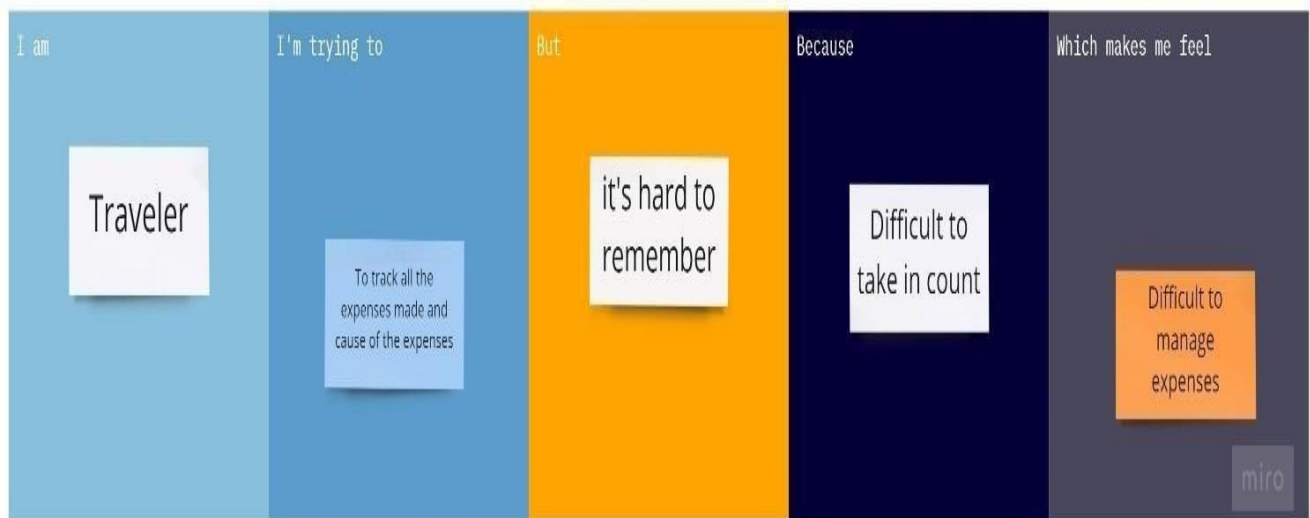
2.1 Existing Problem:

Personal finance management is an important part of people's lives. However, everyone does not have the knowledge or time to manage their finances in a proper manner. 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 get access to an expense tracker that will help in the active management of your finances. Also known as 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 towards the end of the month they don't have sufficient money to meet their needs. While this problem can arise due to low salary, invariably it is due to poor money management skills.

2.2 References:

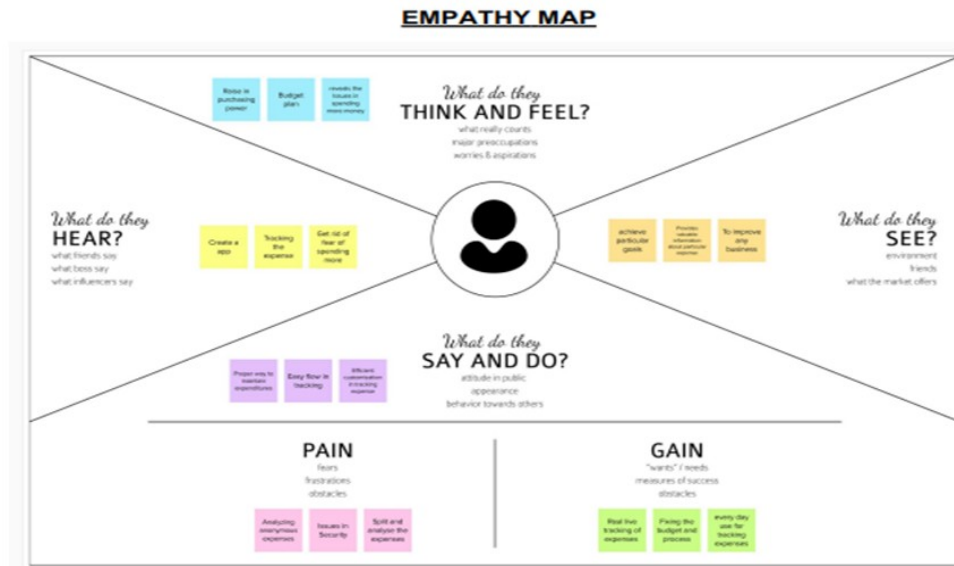
- [1] <https://iopscience.iop.org/article/10.1088/1742-6596/1712/1/012039/pdf>
- [2] <https://www.sciencedirect.com/science/article/pii/S2214212622000503>
- [3] <https://ieeexplore.ieee.org/abstract/document/9396201>
- [4] <https://www.sciencedirect.com/sdfe/reader/pii/S2214212622000503/pdf>

2.3 Problem Statement:



IDEATION & PROPOSED SOLUTION

3.1 Empathy map canvas:



3.2 Ideation & Brainstorming:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving.

Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

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.

3.3 Proposed Solution:

Problem Statement : Attempting to manage the expenses of an individual in an efficient and manageable manner, as compared to the traditional way of expense tracking. .It will reduce time and prone to errors.

Idea / Solution description: Personal finance includes all of the financial choices and tasks that a finance software streamlines by assisting you in effectively managing your money. A personal finance software will not only assist you with accounting and budgeting, but it will also provide you with valuable advice on money.

Novelty / Uniqueness: The application gives the user a chance to plan his/her monthly expenses at the start of the month. Besides this, the user gets a notification when he/she exceeds the limit that is set.

Social Impact / Customer Satisfaction: Using this application one can track their personal expenses and frame a monthly/annual budget. With more users, this application will ensure that financial state of our society improves.

Business Model (Revenue Model): Business people can use subscription/premium feature of this application. Free trial for 1 month can be given to the users.

Scalability of the Solution: It is highly scalable since it is a cloud based application and it can be adopted to any number of user access the application at the same time.

3.4 Proposed Solution fit:

Project Title: Personal Expense Tracker		Project Design Phase-I - Solution Fit Template		Team ID: PNT2022TMD26452	
Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Who is your customer? I.e. working parents of 0-5 y.o. kids People who have trouble tracking their expense	6. CUSTOMER CONSTRAINTS CC 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. Lack of application security and reliability	5. AVAILABLE SOLUTIONS AS 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 do these solutions have? I.e. pen and paper is an alternative to digital notetaking Secured value Insight for the payment notification and seamless integrity to the payment bills to have a proper expense tracking	Explore AS, differentiate	
	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one, explore different sides. Compare the credit and debit ratio and push notification in an equal interval. Project warning notice for over spending. Compare and push notification about the recent product purchase. Proper tracking of the payment done.	9. PROBLEM ROOT CAUSE RC 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. Not having a proper budget planing. Over spending over unnecessary things. Unaware of the credit and debit ratio. Unaware of the balance available in the account	7. BEHAVIOUR BE 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 usage and benefits; indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace) Customers can have customized budget planing and push notification service according to their requirements		Focus on J&P, tap into BE, understand RC
Identify strong TR & EM	3. TRIGGERS TR What triggers customers to act? I.e. seeing their neighbour installing solar panels, reading about a more efficient solution in the news. The motive to track and spend their income properly and efficiently	10. YOUR SOLUTION SL 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 in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour. Analyse the basic need and essentials and plan the expenses according to it. On a busy schedule, its difficult to track those stuffs so create a customised budget plan and expense track mechanism in the application and look towards it properly.	8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. 8.1 Download and create a profile in the application	Identify strong TR & EM	
	4. EMOTIONS: BEFORE / AFTER EM 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. Before: Unaware of the budget plan and inefficient usage of expense After: Proper budget planning and efficient usage of expenses		8.2 Awareness of expense tracking		

REQUIREMENT ANALYSIS

4.1 Functional Requirement:

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement	Sub Requirement
FR-1	User Registration	Registration via Application Registration via E-mail
FR-2	User Confirmation	Confirmation via Email
FR-3	User monthly expense tentative data	Data to be registered in the app
FR-4	User monthly income data	Data to be registered in the app
FR-5	Alert / Notification	Alert via E-mail and push notification
FR-6	User Budget Plan	Planning and Tracking of user expenses vs. budget limit

4.2 Non-Functional Requirement:

Non-functional Requirements:

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

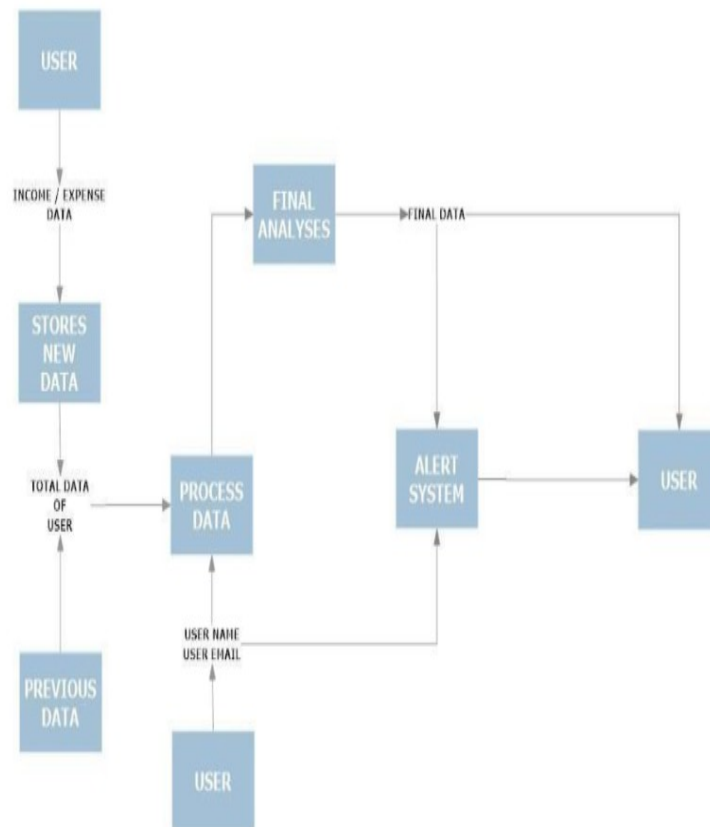
NFR No.	Non-Functional Requirement	Description
NFR-1	Usability	Effectiveness, efficiency, and overall satisfaction of the user while interacting with the application
NFR-2	Security	Authentication and encryption of the application for security purpose
NFR-3	Reliability	Probability of failure-free operations in a specified environment for a specified time
NFR-4	Performance	How the application is functioning and how responsive the application is to the end-users
NFR-5	Availability	In spite of the lack of an active internet connection all features of the application are accessible. Synchronization of data cannot be done
NFR-6	Scalability	The capacity of the application to handle growth, especially in handling more users.

PROJECT DESIGN

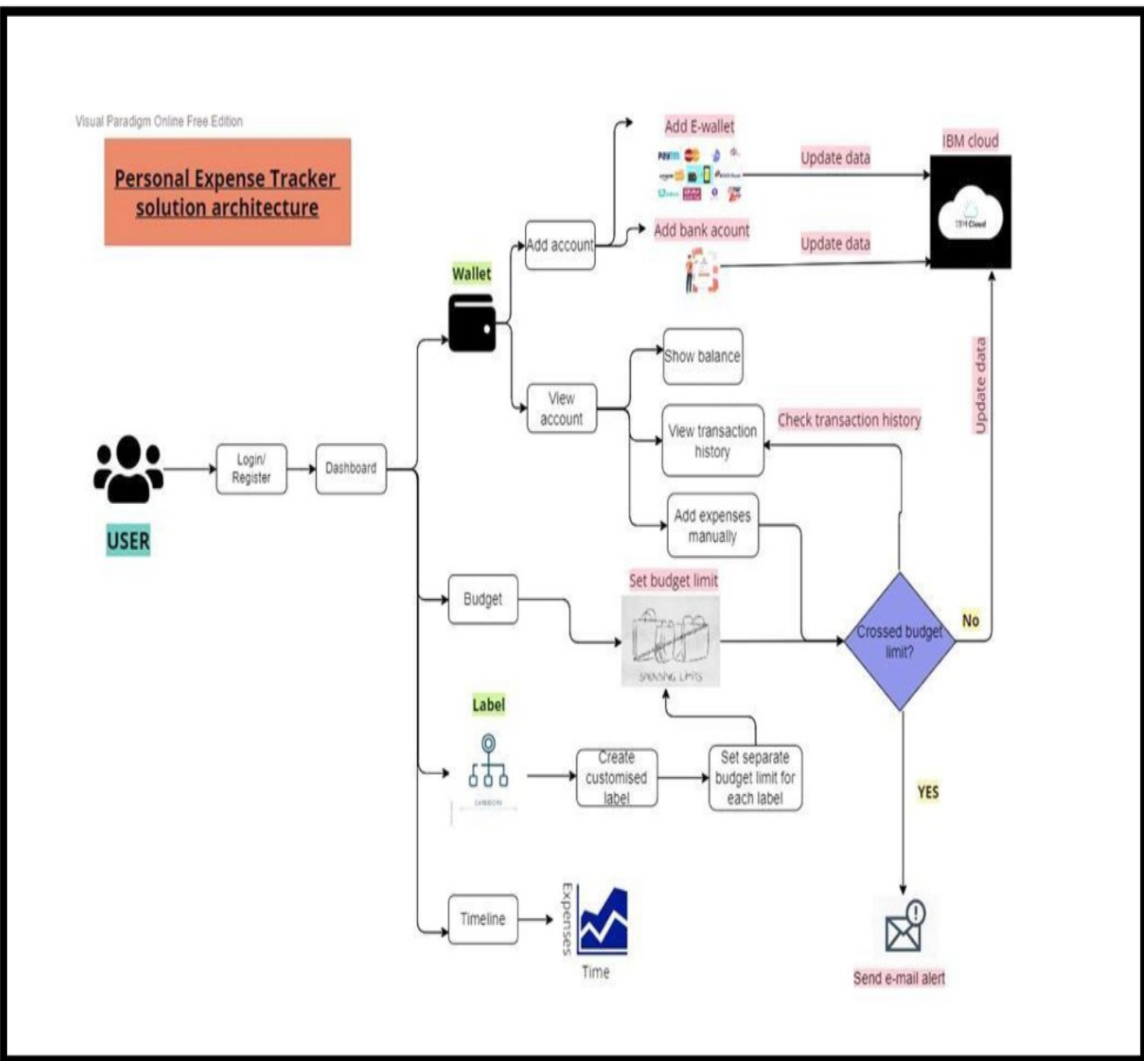
5.1 Data Flow Diagram:

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.



5.2 Solution & Technical Architecture:



5.3 User Stories:

User Stories

Use the below template to list all the user stories for the product.

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	
Customers		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	
Customer		USN- 3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	
Customer	Login	USN - 4	As a user, I can log into the application by entering email & password	I can access the application	High	
Customer	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	high	
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:

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

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

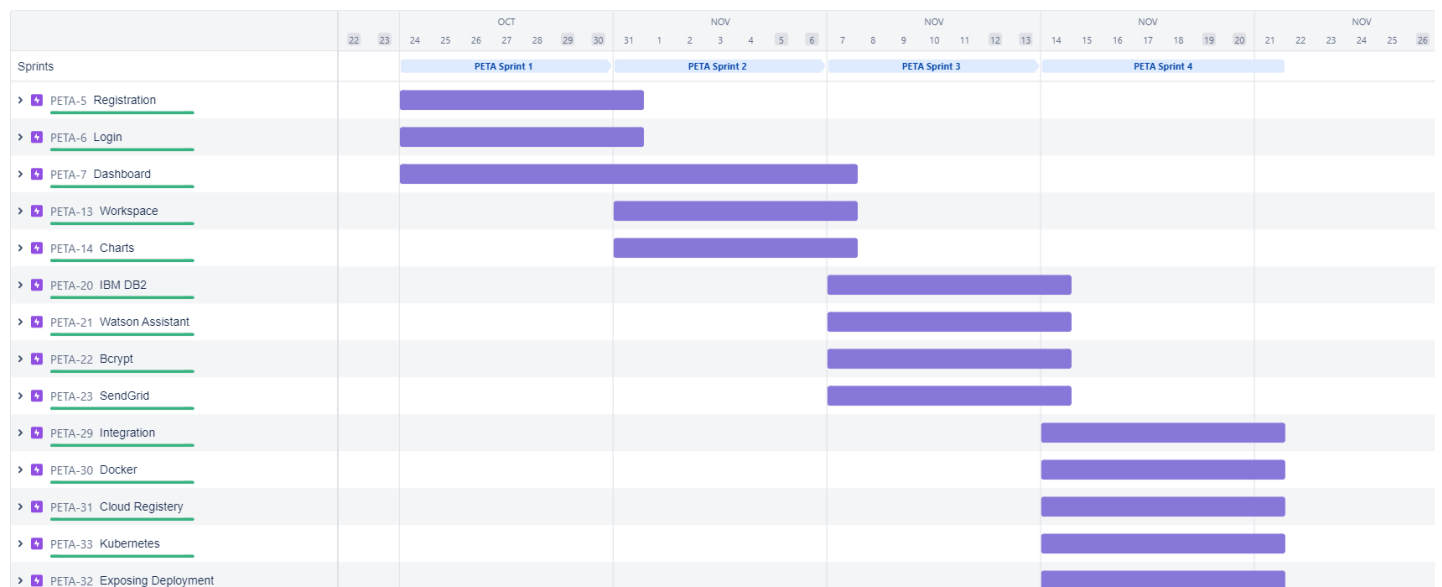
$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

6.2 SPRINT DELIVERY SCHEDULE:

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 , new password and confirming the same password.	2	High	Suriya
		USN -2	As a user , I will receive confirmation email once I have registered for the application.	1	Low	Thamizh chelvan
	Login	USN -3	As a user , I can log into the application by entering email and password / Google OAuth.	2	High	Saran Ruhit
	Dashboard	USN -4	Logging in takes the user to their dashboard.	1	Low	krishnan
Sprint - 2		USN -5	As a user ,I will update my salary at the start of each month.	1	Medium	suriya
		USN -6	As a user , I will set a target/limit to keep track of my expenditure.	1	Medium	Ruhit krishnan
	Workspace	USN -7	Workplace for personal expense tracking	1	Medium	suriya
	Charts	USN -8	Graphs to show weekly and everyday expenditure	2	High	Saran Thamizhchelv an
		USN -9	As a user , I can export raw data as csv file.	1	Medium	saran

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint - 3	IBM DB2	USN -10	Linking database with dashboard	2	High	Suriya
		USN -11	Making dashboard interactive with JS	2	High	thamizhchelvan
	Watson Assistant	USN -12	Embedding Chatbot to clarify user's queries.	1	Low	Saran Thamizhchelvan
	BCrypt	USN -13	Using BCrypt to store passwords securely.	1	Medium	ruhit
	SendGrid	USN -14	Using SendGrid to send mail to the user. (To alert or remind)	1	Medium	Suriya
Sprint - 4	Integration	USN -15	Integrating frontend and backend.	2	High	thamizhchelvan
	Docker	USN -16	Creating Docker image of web app.	2	High	Saran Thamizhchelvan
	Cloud Registry	USN -17	Uploading docker image to IBM cloud registry.	2	High	Saran ruhit
	Kubernetes	USN -18	Creating container using docker and hosting the webapp.	2	High	Suriya
	Exposing Deployment	USN -19	Exposing IP/Ports for the site.	1	Medium	Ruhit suriya

6.3 REPORT FROM JIRA



7.CODING & SOLUTIONING

7.1 Feature 1:

Python

- Python is a widely-used, interpreted, object-oriented, and high-level programming language with dynamic semantics, used for general-purpose programming. It's everywhere, and people use numerous Python-powered devices on a daily basis, whether they realize it or not.
- Python was created by [Guido van Rossum](#), and first released on February 20, 1991.
- Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, Smalltalk, and Unix shell and other scripting languages.
- Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL)
- It is easy to learn – the time needed to learn Python is shorter than for many other languages; this means that it's possible to start the actual programming fast
- It is easy to use for writing new software – it's often possible to write code faster when using Python.
- It is easy to obtain, install and deploy – Python is free, open and multiplatform; not all languages can boast that.
- Programming skills prepare you for careers in almost any industry and are required if you want to continue to more advanced and higher-paying software development and engineering roles.
- Python is now maintained by a core development team at the institute, although Guido van Rossum still holds a vital role in directing its progress.

7.2 Feature 2:

Flask

- **Flask** is a micro [web framework](#) written in [Python](#). It is classified as a [microframework](#) because it does not require particular tools or libraries.
- It has no [database](#) abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they were implemented in Flask itself.
- Extensions exist for [object-relational mappers](#), form validation, upload handling, various open authentication technologies and several common framework related tools.
- Applications that use the Flask framework include [Pinterest](#) and [LinkedIn](#).

7.3 Database Scheme

IBM Db2

- DB2 is a database product from IBM.
- It is a Relational Database Management System (RDBMS). DB2 is designed to store, analyze and retrieve the data efficiently.
- DB2 product is extended with the support of Object-Oriented features and non-relational structures with XML.
- Provide a massively parallel processing (MPP) architecture Exploits Hive, HBase and Apache Spark concurrently for best-in-class analytic capabilities.
- Provides low latency support for ad-hoc and complex queries, high performance, and federation capabilities Understands dialects from other vendors and various products

from Oracle, IBM® Db2® and IBM Netezza® Enables advanced row and column security.

Kubernetes

- **Kubernetes** is also known as '**k8s**'.
- **Kubernetes** is an extensible, portable, and open-source platform designed by **Google** in **2014**.
- It is mainly used to automate the deployment, scaling, and operations of the container-based applications across the cluster of nodes.
- Kubernetes helps to manage containerised applications in various types of physical, virtual, and cloud environments.
- Google Kubernetes is a highly flexible container tool to consistently deliver complex applications running on clusters of hundreds to thousands of individual servers
- Kubernetes is the Linux kernel which is used for distributed systems.
- It helps you to be abstract the underlying hardware of the nodes(servers) and offers a consistent interface for applications that consume the shared pool of resources.

8 TESTING:

8.1 Test case

- The purpose of testing is to discover errors.
- Testing is the process of trying to discover every conceivable fault or weakness in a work product.
- It provides a way to check the functional of your components, subassemblies, assemblies and/or a finished product
- It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectation and does not fail in an unacceptable manner.
- There are various types of test. Each test type addresses a specific testing requirement

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
LoginPage_TC_OO1	Functional	Home Page	Verify user is able to see the Login/Singup popup when user clicked on My account button	1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Singup popup displayed or not	http://127.0.0.1:5000/signup	Login/Singup popup should display	Working as expected	Pass	Steps are not clear to follow	yes		customer
LoginPage_TC_OO2	UI	Home Page	Verify the UI elements in Login/Singup popup	1.Enter URL and click go 2.Click on My Account dropdown button 3.Verify login/Singup popup with below UI elements: a.email text box b.password text box c.Login button d.New customer? Create account link e.Last password? Recovery password link	http://127.0.0.1:5000/signup	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Pass	Steps are not clear to follow	yes		customer

LoginPage_TC_OO3	Functional	Home page	Verify user is able to log into application with Valid credentials	1.Enter URL(https://shopnizer.com/) and click go 2.Click on My Account dropdown button 3.Enter Valid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: thamizhchelvan@gmail.com password: Thamizhchelvan123	User should navigate to user account homepage	Working as expected	Pass	Steps are not clear to follow	yes		customer
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with Invalid credentials	1.Enter URL(https://shopnizer.com/) and click go 2.Click on My Account dropdown button 3.Enter Invalid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: thamizhchelvan@gmail.com password: Thamizhchelvan123	Application should show 'Incorrect email or password' validation message.	Working as expected	Pass	Steps are not clear to follow	yes		customer

8.2 User Acceptance Testing

1.Purpose of Document

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

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Sub total
By Design	8	4	2	3	17
Duplicate	1	0	2	1	4
External	2	3	0	1	6
Fixed	10	2	5	18	35

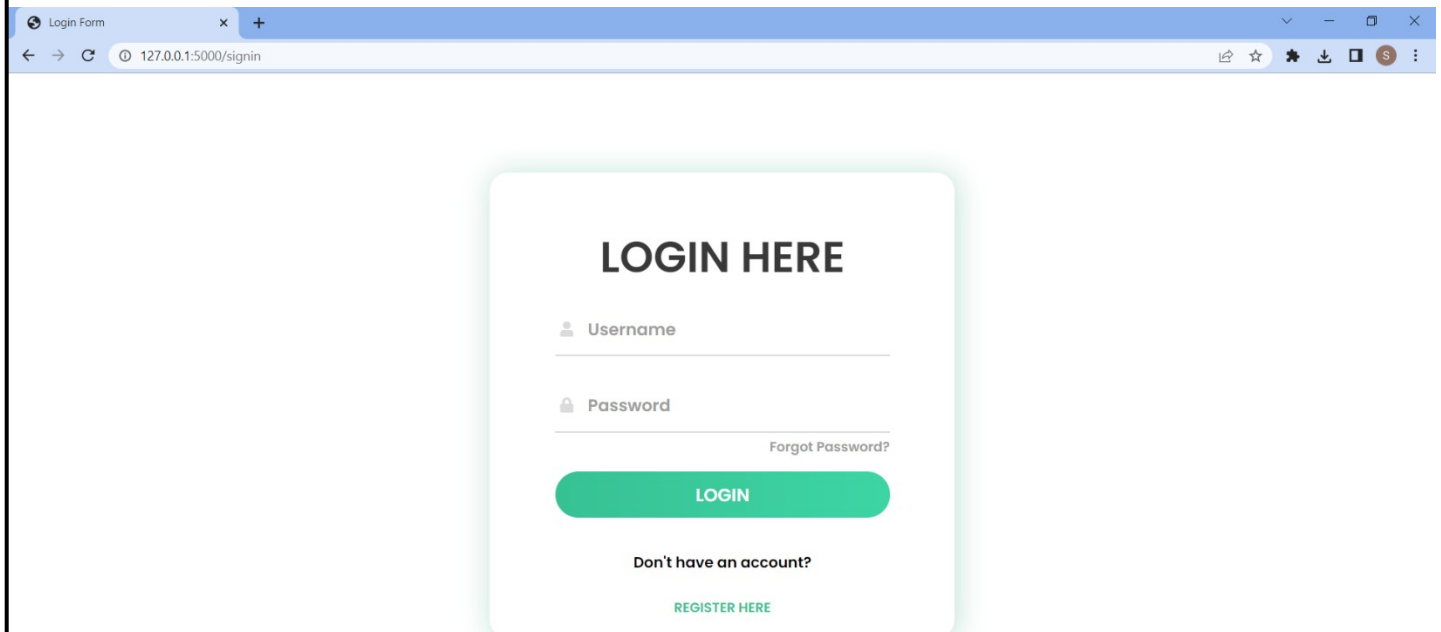
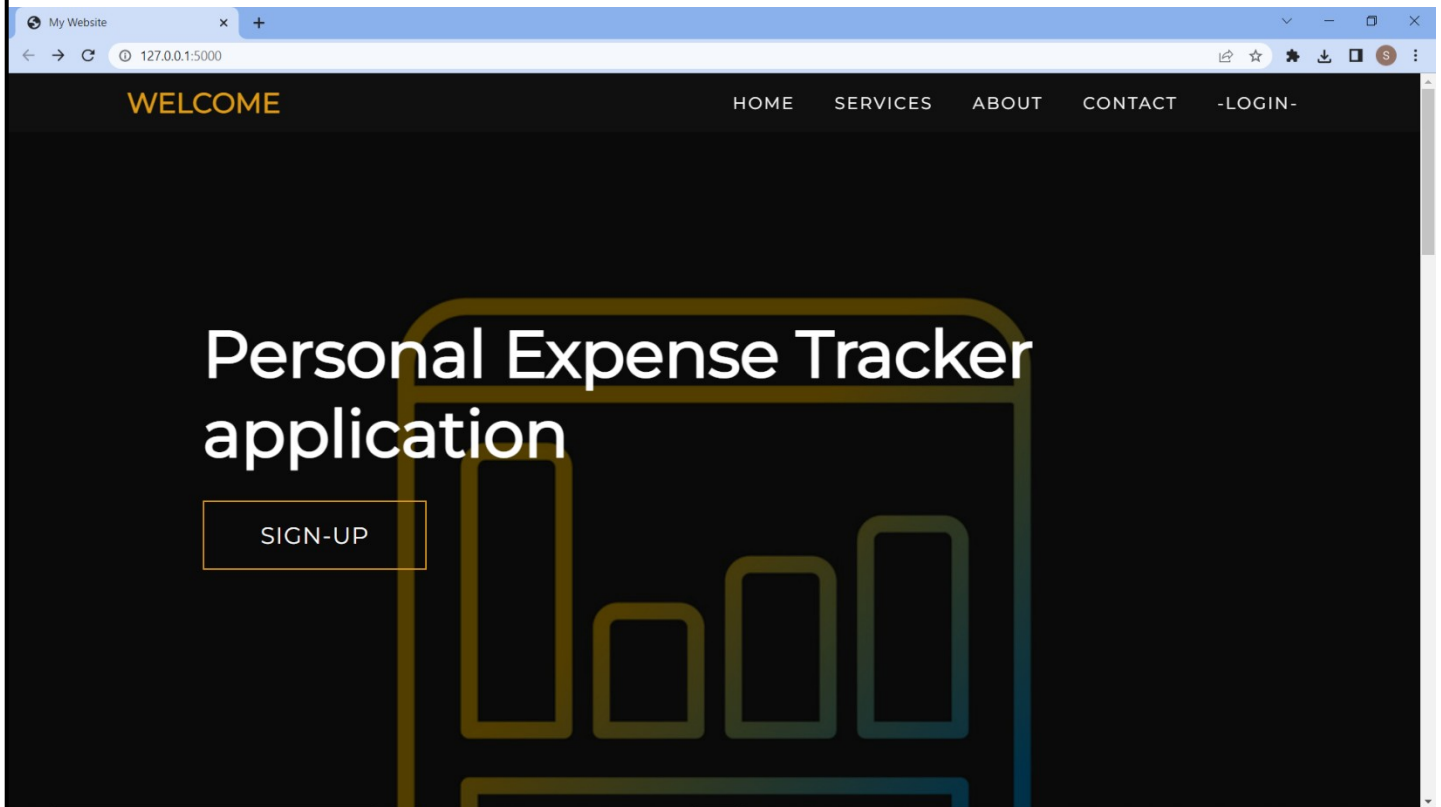
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	3	2	1	6
Totals	21	12	13	25	71

3. Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	8	0	0	8
Client Application	50	0	0	50
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	10	0	0	10
Final Report Output	6	0	0	6
Version Control	3	0	0	3

9. RESULT:



Welcome user

127.0.0.1:5000/home

Personal Expense Tracker

Home

Add

History

Report

User

Today Expense Breakdown

Time

Amount

Expense Breakdown

Food	0
Entertainment	0
Business	0
Rent	0
EMI	0
Other	0
Total	₹ 0

EXPENSE BREAKDOWN

Food

Entertainment

Business

Other

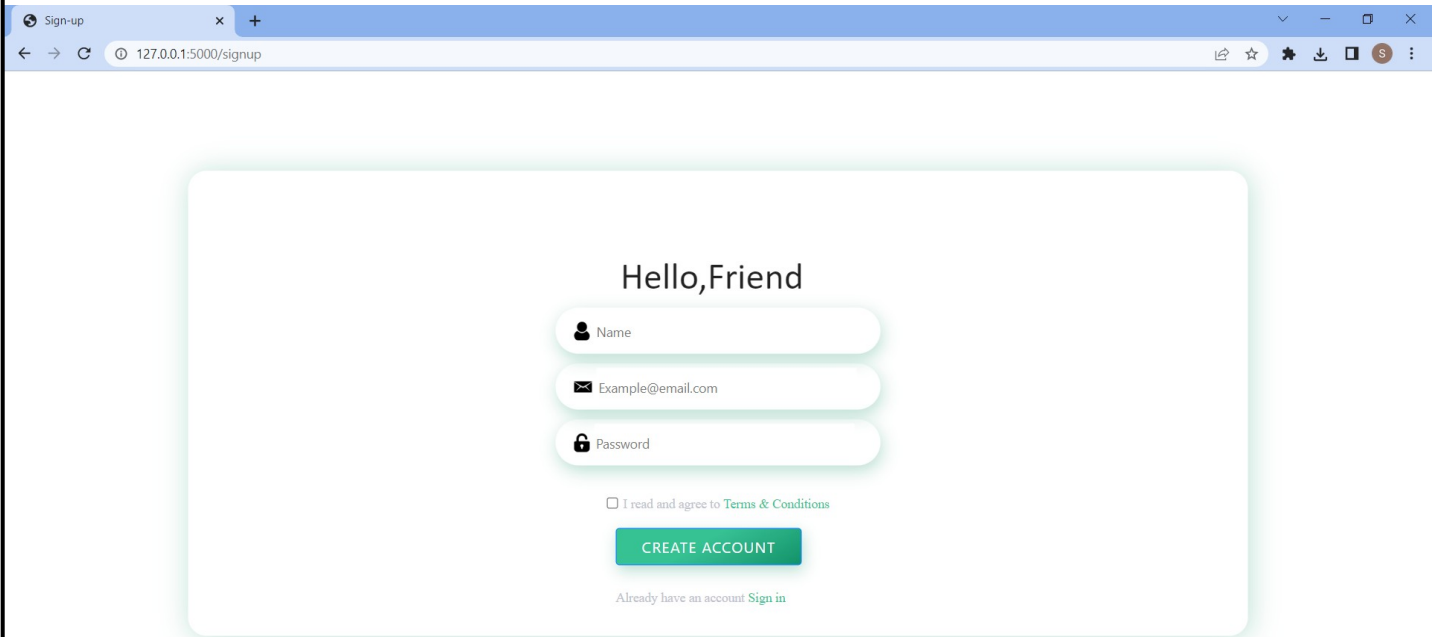
Hi! I'm a virtual assistant. How can I help you today?

Track monthly expenses

Track yearly expenses

Type something...

Built with IBM Watson®



It has been implemented successfully and Executed

10. ADVANTAGES & DISADVANTAGES

ADVANTAGES:

- Track your expenses anywhere, anytime.
- Seamlessly manage your money and budget without any financial paperwork.
- ...
- Access, submit, and approve invoices irrespective of time and location.
- Avoid data loss by scanning your tickets and bills and saving in the app.

DISADVANTAGES:

- Difficulty finding a budgeting method that works for you
- Budgeting takes time and effort
- You may think it's too rigid

11 CONCLUSION :

The project personal expensive tracker has been successfully implemented by using python, flask, html/css/java script and the database created by using ibm db2 and also successfully executed and implemented.

12. FUTURE SCOPE:

1) It will have various options to keep record (for example Food, Travelling Fuel, Salary).

2) Automatically it will keep on sending notifications for our daily expenditure.

3) In today's busy and expensive life, we are in a great rush to make moneys, but at the end of the month we broke off. As we are unknowingly spending money on title and unwanted things. So, we have come over with the plan to follow our profit.

13. APPENDIX

SOURCE CODE:

```
<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Sign-up</title>

    <link href="..\static\css\signup.css" rel="stylesheet">
```

```
<script src="https://kit.fontawesome.com/a81368914c.js"></script>
```

```
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
```

```
</head>
```

```
<body>
```

```
<!-- container -->
```

```
<div class="container" >
```

```
<!--sign-up-box-container--->
```

```
<div class="sign-up">
```

```
<div id="png">
```

```
<a href="/" title="HOME"></a>
```

```
</div>
```

```
<div class="frm">
```

```
<!--heading-->
```

```
<form action="/register" method="post">
```

```
<div class="msg">{{ msg }}</div>
```

```
<h1 class="heading">Hello,Friend</h1>
```

```
<!--name-box-->
```

```
<div class="text">
```

```
  
```

```
  <input placeholder="Name" type="text" name="username"/>
```

```
</div>
```

```
<!--Email-box-->
```

```
<div class="text">
```

```
  
```

```
  <input placeholder="Example@email.com" type="email" name="email"/>
```

```
</div>
```

```
<!--Password-box-->
```

```
<div class="text">
```

```
  
```

```
  <input placeholder="Password" type="password" name="password"/>
```

```
</div>
```

```
<!--terms-->
```

```
<div class="terms">
```

```
  <input class="check" type="checkbox" required/>
```

```
  <p class="conditions">I read and agree to <a href="#">Terms & Conditions</
```

```
a></p>
```

```

</div>

<!--button-->

<div class="toop">

    <button type="submit" class="btn btn-primary" >CREATE
ACCOUNT</button><br><br>

    <!--sign-in-->

    <p class="conditions" id="p3">Already have an account <a href="/signin">Sign
in</a></p>

</div>

</form>

</div>

</div>

</div>

</body>

</html>

```

GITHUB & PROJECT DEMO LINK:

Github: <https://github.com/IBM-EPBL/IBM-Project-22664-1659855878>

Project demo video link1:

<https://www.loom.com/share/fb1c9e45829344ba94cbf4902fb60b57>

project demo video link2:

https://drive.google.com/file/d/1zw-9H4xmZGHYvAn1JKtNcrlhOX-X3yO_/view

