

PERSONAL EXPENSE TRACKER APPLICATION

PROJECT PHASE I REPORT

Submitted by

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Project Report Format

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PROJECT REPORT

1. INTRODUCTION

With the launch and increase in sales of smartphones over the last few years, people are using mobile applications to get their work done, which makes their lives easier. Mobile applications comprise various different categories such as Entertainment, Sports, Lifestyle, Education, Games, Food and Drink, Health and Fitness, Finance, etc. This Expense Tracker application falls in the Finance Category and serves the important purpose of managing finances which is a very important part of one's life. The software product went through the design, development, and the testing phase as a part of the Software Development Lifecycle

a. Project Overview

In today's busy and expensive life we are in a great rush to make money. But at the end of the month, 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. The daily expense tracker aims to help everyone who is planning to know their expenses and save from it. An Personal expense tracker is a app that the user's can update their daily expenses so that they are well known for their expenses. Here users can choose categories for expense types like food, clothing, rent, and bills where they have to enter the money that has been spent and also can add some information in additional information to specify the expense. Users will be able to see graphs of expenses. Users can save those graphs for their own reference.

b. Purpose

In proposed system user has more number of added features to the existing features like

- Weekly Budget Planner
- Automated message Alert
- UPI linkup

- Weekly and Monthly Analysis
- App Authentication
- Wish list
- Rewards

Weekly Budget Planner to track their expenses. Automated message Alert is generated when they cross their budget. UPI linkup to track their online transactions. Weekly and Monthly Analysis are generated in the form of pie chart. App Authentication for security of the user. Income, Expenses, and Wish List are the three data entry choices available to the use

2. LITERATURE SURVEY

S.No	Title	Author	Journal	Year	Methodology
1.	Security and privacy challenges in mobile cloud computing : survey and way ahead	Muhammad Baqer Mollah et al	Journal of Network and Computer Applications	2017	Computational offloading, Virtualization
2.	Exploring infrastructure support for app based services on cloud platforms	Hai Nguyen et al	Journal of Cloud Computing Advances Systems and Applications	2017	Virtualization, Introspection and Security

3.	Mobile Financial Management Application using Google Cloud Vision AP	Kurniawan Dwi Saputra et al	International Conference on Computer Science and Computaional Intelligence	2019	Google Vision Cloud API, Optical Character Recognition
4.	Cloud Based Development Issues	Sukhpal Singh, Inderveer Chana	International Journal of Cloud Computing and Services Science	2020	A Methodical Analysis
5.	Expense Tracker	Prof Miriam Thomas, Lekshmi P, and Dr.Mahaleksh mi T	International Journal of Advanced Research in Science, Communicati on and Technology	2020	Least Square Algorithm
6.	Cloud based Expense Tracker	Asthha Wahal and Muskan Aggarwal	International Journal of Innovative Research in Technology	2021	Clustering, Apriori algorithm, Virtualization
7.	A Novel Expense Tracker	Muskaan Sharma, Ayush Bansal, Dr. Raju Ranjan, Shivam Sethi	International Journal of Innovative Research in Technology	2021	Statistical Analysis, Data Mining

8.	Student Expense Tracking Application	Saumya Dubey, Pragya Dubey, Rignved Rishabh Kumar, Aaisha Khatoon	International Journal of Advance Research and Innovative Ideas in Education	2022	Clustering, Classification and Association
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a. Existing problem

an expense tracker to prevent having to calculate income and expenses, as well as to remind someone to keep their expenses in track and also to add some details on how much money comes from other people and what expenses or payments the user have to make on a given date or month, User have categories in the expenditure tracker such as add expense, monthly expenses, add new expense, see categories of spending, export expenses in a date range, remove export files, and view expenses by category

b. References

[1] D. GRAZIANO, Gartner: Apple leads smartphone sales to new heights. BGR Media, <http://bgr.com/2012/02/15/gartner-apple-leads-smartphone-sales-to-new-heights/>, accessed October 2012, February 2012.

[2] M. BROWNLOW, Smartphone statistics and market share. Email-Marketing-Reports, <http://www.email-marketing-reports.com/wireless-mobile/smartphone-statistics.htm>, accessed October 2012, October 2012.

[3] C. HEATH AND J. B. SOLL, Mental budgeting and consumer decisions, J. Consumer Res., 23 (1996), pp. 40-52.

[4] J. HASTINGS AND J. M. SHAPIRO, Mental accounting and consumer choice: Evidence from commodity price shocks. Unpublished report, 2012.

[5] MINT, Homepage. Mint, <https://www.mint.com>, accessed October 2012, n.d

[6] APPLE, iOS technology overview. Apple, <http://developer.apple.com/library/ios/#documentation/Miscellaneous/Conceptual/iPhoneOSTechOverview/Introduction/Introduction.html>, accessed October 2012, n.d.

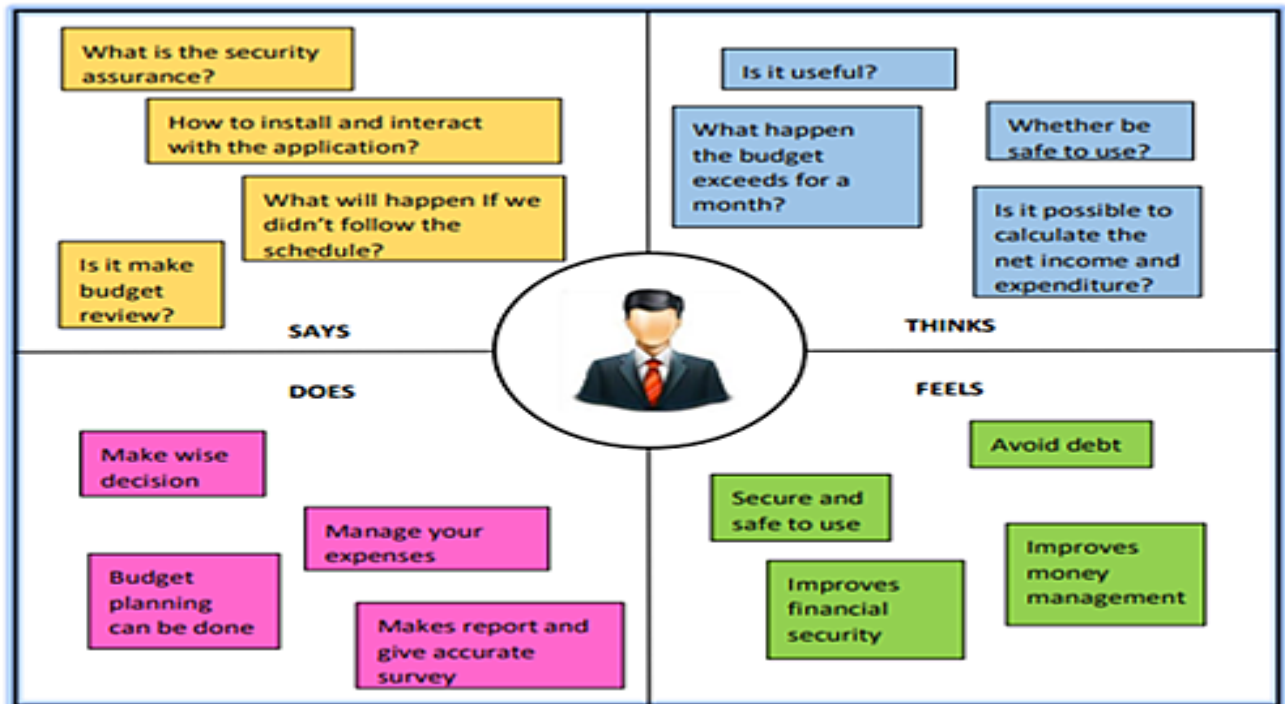
[7] APPLE, Key objects of an iOS app. Apple, http://developer.apple.com/library/IOS/#documentation/iPhone/Conceptual/iPhoneOSProgrammingGuide/AppArchitecture/AppArchitecture.html#//apple_ref/doc/uid/TP40007072-CH3-SW2, accessed October 2012, n.d.

c. Problem Statement Definition

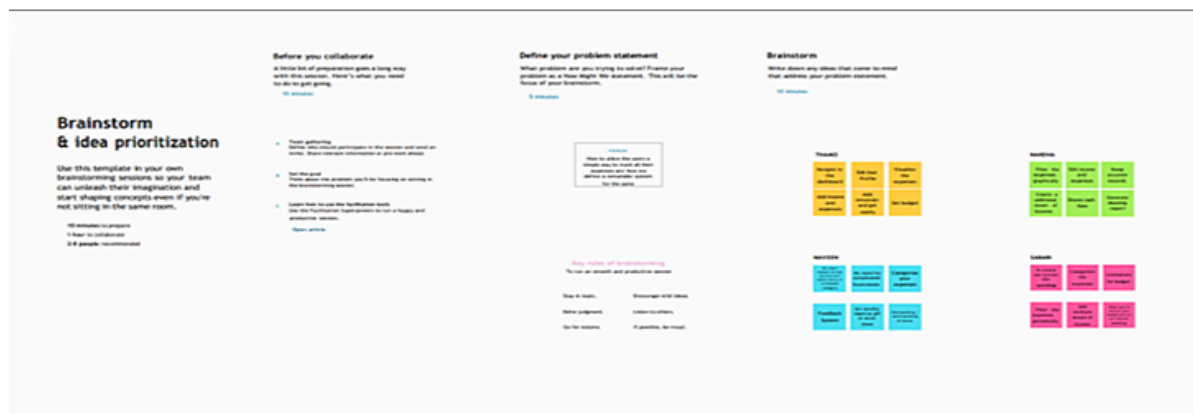
- At the end of the month we start to have money crisis.
- Lack of proper planning of our income.
- Person has to keep a log in a diary or in a computer.
- All the calculations need to be done by the user.
- Overload to rely on the daily entry of the expenditure.

3. IDEATION & PROPOSED SOLUTION

a. Empathy Map Canvas



b. Ideation & Brainstorming





c. Proposed Solution

4. S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<p>Tracking expenses is one of the key factors in making budget work. At the instant, there is no as such complete solution present easily which enables a person to keep a track of its daily expenditure easily.</p> <p>To do so a person has to keep a log in a diary or in a computer, also all the calculations need to be done by the user which may sometimes results in errors leading to losses.</p> <p>Due to lack of a complete tracking system, there is a constant overload to rely on the daily entry of the expenditure.</p>

2.	Idea / Solution description	<p>In this project, we developed a cloud-based web application which keeps track of user's personal expenses.</p> <p>This system attempts to free the user with as much as possible the burden of manual calculation and to keep the track of the expenditure. This system also eliminates sticky notes, bills.</p>
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3.	Novelty / Uniqueness	<p>This personal expense tracker Application has features that enables the user to have an option to set a limit for the amount to be used.</p> <p>If the limit is exceeded the user will be notified with an Email and SMS alert. Thistracker doesn't have annoying ads.</p>
4.	Social Impact / Customer Satisfaction	<p>The user will be able to Stick to their Spending Limits. They can able to scan their bills anytime thus data loss is avoided.</p> <p>Users can also able to get an analysis of their expenditure in graphical forms.</p>
5.	Business Model (Revenue Model)	<p>This application will generate revenue by offering premium features to the user.</p> <p>Advertising through app is the easy way to earn money. Users may pay to remove the app advertisements.</p>

		Through subscription the users can able to connect their bank account.
6 .	Scalability of the Solution	<p>Since this application is deployed on IBM Cloud, it can handle multiple users at a time.</p> <p>With our application, the users can be able to manage their expenses more effectively and know about their budget Vs income.</p>

a. Problem Solution fit

Project Design Phase-I - Solution Fit Template

Project Title: Personal Expense Tracker Application

Team ID: PNT2022TMID17124

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) <ul style="list-style-type: none"> ❖ Working peoples ❖ Organizations ❖ Students and families ❖ Common people with all ages can able to track their expenses. 	5. CUSTOMER CONSTRAINTS <ul style="list-style-type: none"> ❖ Network Issues ❖ Data Privacy ❖ Spending power ❖ Available devices 	8. AVAILABLE SOLUTIONS <p>People makes use of sticky notes or diary for calculating their expenditure.</p> <p>Pros:</p> <ol style="list-style-type: none"> 1. Didn't need any devices for calculations. <p>Cons:</p> <ol style="list-style-type: none"> 1. Time consuming. 2. Manual errors occur sometimes. 	Explore AS, differentiate
Focus on JBP, tap into BE, understand RC	2. JOBS-TO-BE-DONE / PROBLEMS <ul style="list-style-type: none"> ❖ People have to track their expenses regularly. ❖ They need to keep their receipts and bills which shows their amount they spent. ❖ Also they need to manually add or remove the desired categories. 	6. PROBLEM ROOT CAUSE <ul style="list-style-type: none"> ❖ The root cause for this problem is the delay in the budget. ❖ There may be a chance of getting errors in human calculations. ❖ No one alerts if their spending exceeds particular limit. ❖ They do not have enough time for calculating their expenditure. 	9. BEHAVIOUR <ul style="list-style-type: none"> ❖ People should know their budget for each month and set appropriate saving goals. ❖ Collect receipts regularly without fail. 	Focus on JBP, tap into BE, understand RC

3. TRIGGERS <ul style="list-style-type: none"> ❖ Realizing that excessive spending leading to lack of money in case of emergencies. ❖ Lack of Budgeting knowledge. 	7. YOUR SOLUTION <ul style="list-style-type: none"> ❖ A cloud-based web application which keeps track of user's personal expenses. This system attempts to free the user with as much as possible the burden of manual calculation and to keep the track of the expenditure. ❖ User just need to enter their day-to-day expenses. They also have an option to set the limit. If their expenditure exceeds that limit, notification will be sent through mail. ❖ This system also eliminates sticky notes, bills. 	10. CHANNELS OF BEHAVIOUR <p>ONLINE</p> <ul style="list-style-type: none"> ❖ Provide the details of day-to-day expenses. ❖ Select the area where customers use. ❖ Maintain the expenses for budgeting. <p>OFFLINE</p> <ul style="list-style-type: none"> ❖ Maintain the required documents regularly. ❖ Inspect the expenses for budgeting.
4. EMOTIONS: BEFORE / AFTER <p>Before</p> <ul style="list-style-type: none"> ❖ Excessive expenditure ❖ Afraid of spending <p>After</p> <ul style="list-style-type: none"> ❖ Being aware of what they are spending. ❖ Satisfied and happy with their budget expenditure. ❖ There will not be any frustrations any more since the process is quick and flexible. 		

5. REQUIREMENT ANALYSIS

a. Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Financial Accounts	Account Details Verification of Details
FR-4	User Dashboard	Expense Data Data Records
FR-5	User Notifications	System Access Real time Alerting
FR-6	Security of User Data	Secured Database Data Security Algorithms

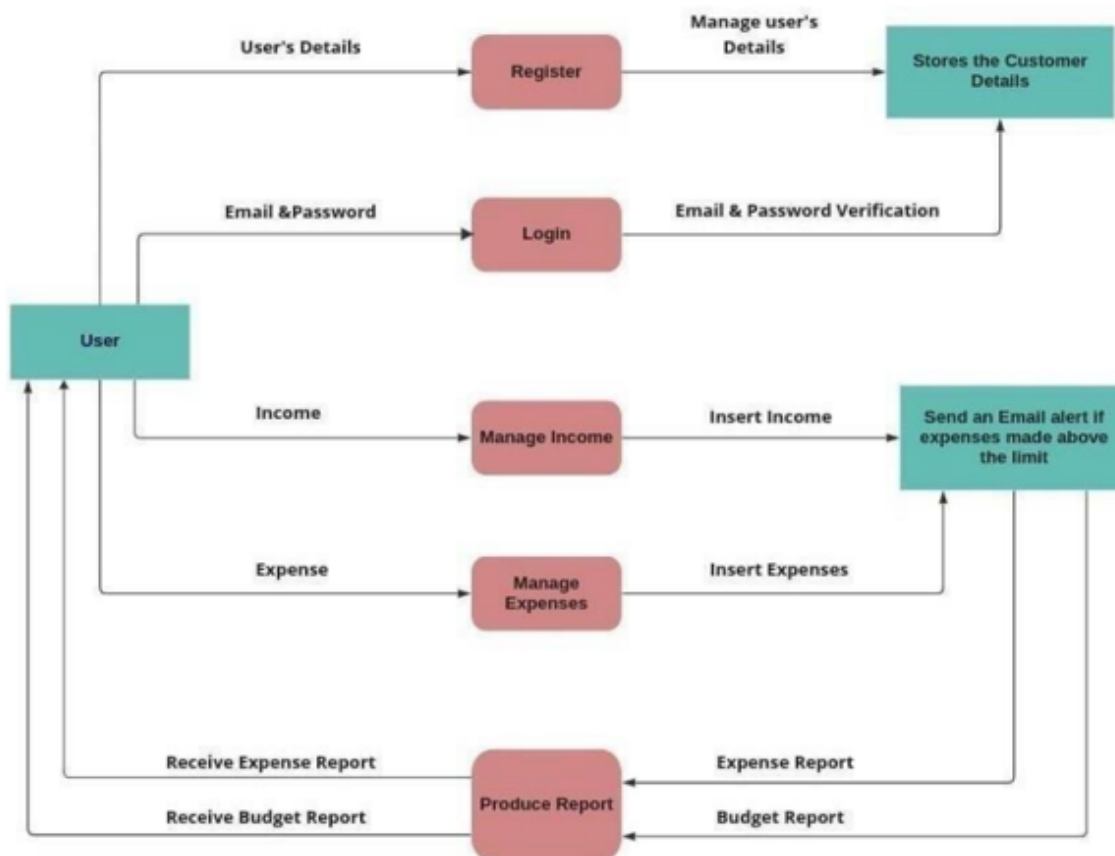
b. Non-Functional requirements

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	By using this application, the user can keep track of their expenses and can ensure that user's money is used wisely.
NFR-2	Security	Maintain user personal details in a encrypted manner by using data security algorithms .
NFR-3	Reliability	It will maintain a proper tracking of day-to-day expenses in an efficient manner.

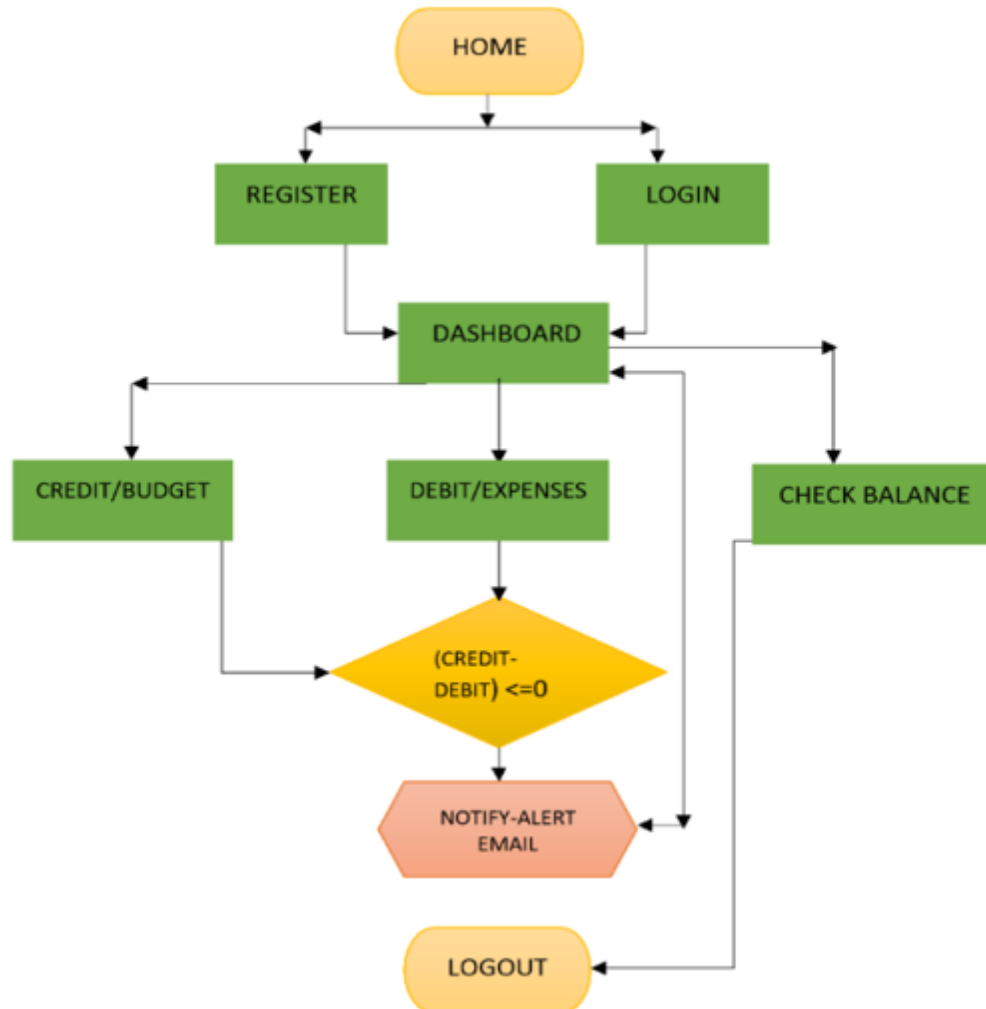
NFR-4	Performance	By enter our incoming and departing cash, and the software can help you keep and monitor it with at-most quality and security with high performance.
NFR-5	Availability	Using charts and graphs may help you monitor your budgeting and assets.
NFR-6	Scalability	Rely on your budgeting app to track, streamline, and automate all the recurrent expenses and remind you on a timely basis.

6. PROJECT DESIGN

a. Data Flow Diagrams



b. Solution & Technical Architecture



c. User Stories

user Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	
Customer (Mobile 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	
	Login	USN-2	As a user, I can log into the application by entering email & password	I can access the application	High	
	Dashboard	USN-3	As a user I can enter my income and expenditure details.	I can view my daily expenses	High	
Customer Care Executive		USN-4	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-5	As an administrator I can upgrade or update the application.	I can fix the bug which arises for the customers and users of the application	Medium	
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7. PROJECT PLANNING & SCHEDULING

a. Sprint Planning & Estimation

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	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

b. Sprint Delivery Schedule

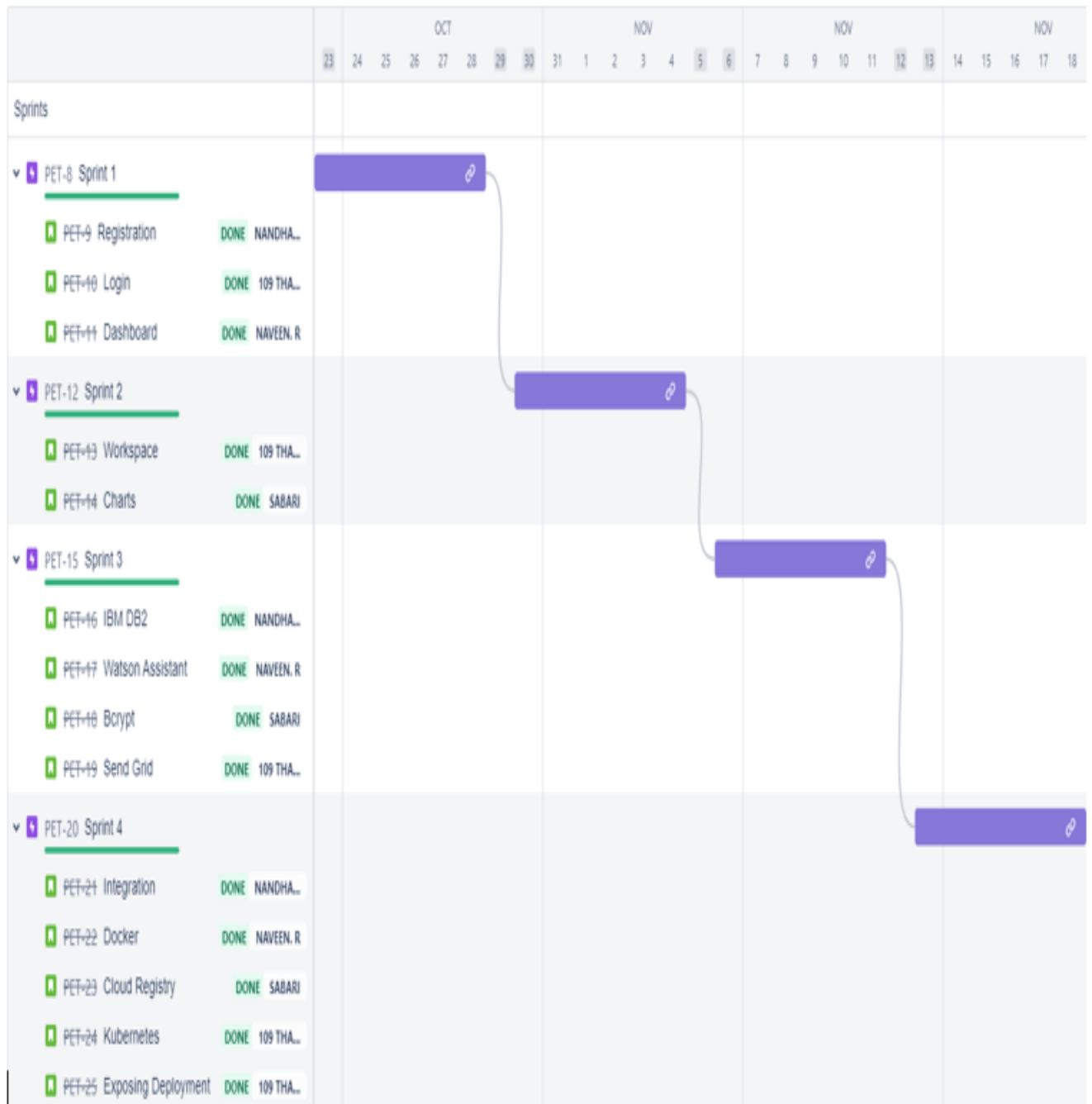
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint - 1	Registration	USN -1	As a user , I can register for the application by entering my email , new password and confirming the same password.	2	High	Thamodharan S Nandha Kumar M Naveen R Sabari K
		USN -2	As a user , I will receive confirmation email once I have registered for the application.	1	Low	
	Login	USN -3	As a user , I can log into the application by entering email and password / Google OAuth.	2	High	Thamodharan S Nandha Kumar M Naveen R Sabari K
	Dashboard	USN -4	Logging in takes the user to their dashboard.	1	Low	

Sprint - 2		USN -5	As a user ,I will update my salary at the start of each month.	1	Medium	Nandha Kumar
		USN -6	As a user , I will set a target/limit to keep track of my expenditure.	1	Medium	Naveen
	Workspace	USN -7	Workplace for personal expense tracking	1	Medium	Thamodharan S
	Charts	USN -8	Graphs to show weekly and everyday expenditure	2	High	Naveen
		USN -9	As a user , I can export raw data as csv file.	1	Medium	Nandha Kumar

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	Nandha Kumar

		USN -11	Making dashboard interactive with JS	2	High	Thamodharan
	Watson Assistant	USN -12	Embedding Chatbot to clarify user's queries.	1	Low	Naveen
	BCrypt	USN -13	Using BCrypt to store passwords securely.	1	Medium	Sabari
	SendGrid	USN -14	Using SendGrid to send mail to the user. (To alert or remind)	1	Medium	Nandha Kumar
Sprint - 4	Integration	USN -15	Integrating frontend and backend.	2	High	Thamodharan
	Docker	USN -16	Creating Docker image of web app.	2	High	Naveen
	Cloud Registry	USN -17	Uploading docker image to IBM cloud registry.	2	High	Sabari
	Kubernetes	USN -18	Creating container using docker and hosting the webapp.	2	High	Naveen
	Exposing Deployment	USN -19	Exposing IP/Ports for the site.	1	Medium	Nandha Kumar

c. Reports from JIRA



8. CODING & SOLUTIONING (Explain the features added in the project along with code)

a. Feature 1

```
templates > home > login.html > div.bg-text > body.bg-primary > div#layoutAuthentication > div#layoutAuthentication_content > main > div.container
1 {% extends 'base.html' %}
2 {% block body %}
3 <div class="bg-image"></div>
4
5 <div class="bg-text">
6
7 <body class="bg-primary">
8 <div id="layoutAuthentication">
9 <div id="layoutAuthentication_content">
10 <main>
11 <div class="container">
12 <div class="row justify-content-center">
13 <div class="col-lg-5">
14 <div class="card shadow-lg border-0 rounded-lg mt-5">
15 <div class="card-header">
16 <h3 class="text-center font-weight-light my-4">Expense Tracker by
17 DataFlair-Login</h3>
18 </div>
19 <div class="card-body">
20 <form action="/handlelogin/" method="post">
21 <div class="form-group">
22 <input class="form-control" type="text" placeholder="Enter user name" required />
23 </div>
24 <div class="form-group">
25 <input class="form-control" type="password" placeholder="Enter password"
26 required />
27 </div>
28 </div>
29 </div>
30 </div>
31 </div>
32 </div>
```

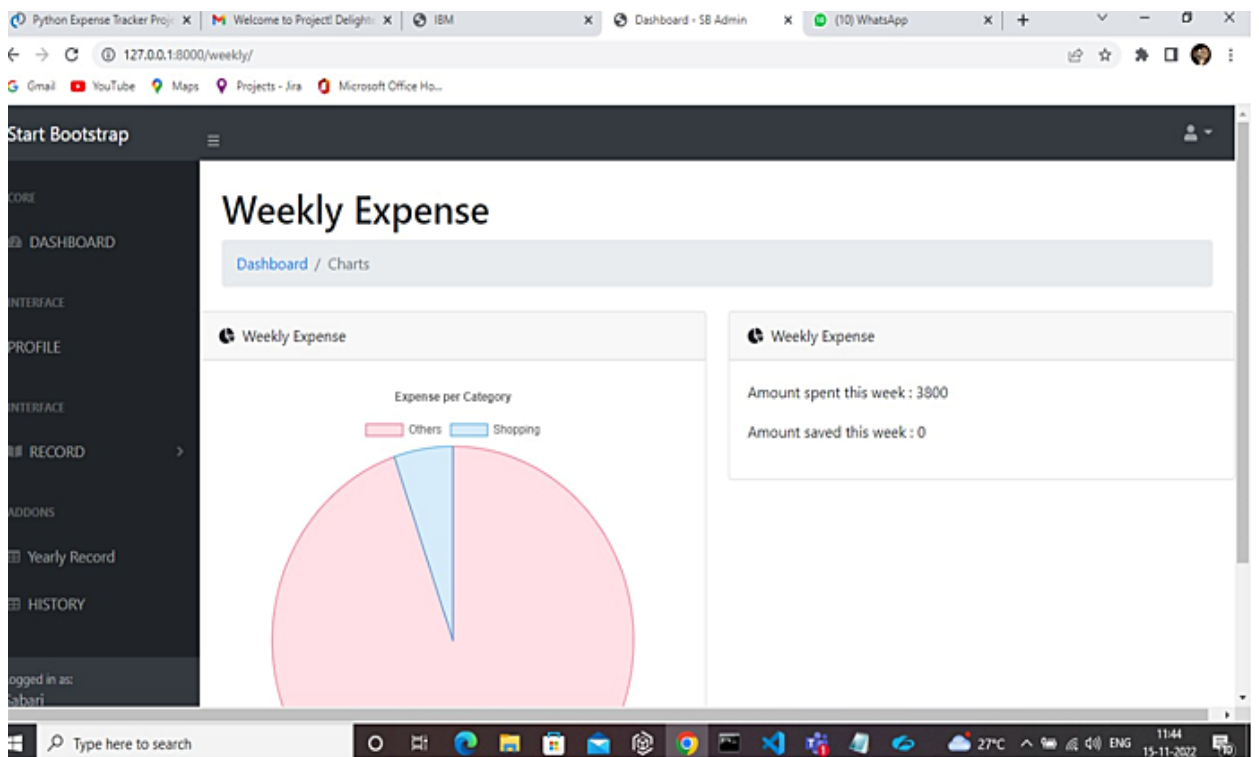
b. Feature 2

```
File Edit Selection View Go Run Terminal Help
EXPENSETRACKER
  info.html
  login.html
  output.html
  password_reset_done.html
  password_reset_form.html
  profile_edit.html
  profile.html
  register.html
  reset_password_sent.html
  reset_password.html
  stats.html
  tables.html
  weekly.html
  base.html
  base1.html
  base2.html
  db.sqlite3
  manage.py
  auth_group_permissions
  id: integer
  group_id: integer

templates > home > reset_password.html > ...
1 {% extends 'base2.html' %}
2 {% block body %}
3 <body class="bg-primary">
4 <div id="layoutAuthentication">
5 <div id="layoutAuthentication_content">
6 <main>
7 <div class="container">
8 <div class="row justify-content-center">
9 <div class="col-lg-5">
10 <div class="card shadow-lg border-0 rounded-lg mt-5">
11 <div class="card-header"><h3 class="text-center font-weight-light my-4">Passwor
12 </div>
13 <div class="card-body">
14 <div class="small mb-3 text-muted">Enter your email address and we will sen
15 <form action="/check/" method="post">
16 <div class="form-group">
17 <input type="text" placeholder="Enter email" required />
18 </div>
19 <div class="form-group">
20 <input type="submit" value="Send Email" />
21 </div>
22 </div>
23 <div class="card-footer text-center">
24 <div class="small"><a href="/register/">Need an account? Sign up!</a></div>
25 </div>
26 </div>
27 </div>
28 </div>
29 </div>
30 </div>
31 </div>
32 </div>
```



```
File Edit Selection View Go Run Terminal Help ExpenseTracker
EXPLORER
EXPENSETRACKER
  login.html
  output.html
  password_reset_done.html
  password_reset_form.html
  profile_edit.html
  register.html
  reset_password_sent.html
  reset_password.html
  stats.html
  tables.html
  weekly.html
  base.html
  base1.html
  base2.html
  db.sqlite3
  manage.py
OUTLINE
TIMELINE
SQLITE EXPLORER
  db.sqlite3
    auth_group
    auth_group_permissions
      id: integer
      group_id: integer
templates > base2.html > ...
1 X load static %
2 <!DOCTYPE html>
3 <html lang="en">
4 <head>
5   <meta charset="utf-8" />
6   <meta http-equiv="X-UA-Compatible" content="IE=edge" />
7   <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
8   <meta name="description" content="" />
9   <meta name="author" content="" />
10  <title>Page Title - SB Admin</title>
11  <link rel="stylesheet" type="text/css" href="{% static 'home.css' %}">
12  <link rel="stylesheet" type="text/css" href="{% static 'addmoney.css' %}">
13  <script src="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.13.0/js/all.min.js" crossorigin="anonymous"></script>
14 </head>
15 <body>
16   {% block body %}
17   {% endblock body %}
18   <div id="layoutAuthentication_footer">
19     <div class="py-4 bg-light mt-auto">
20       <div class="container-fluid">
21         <div class="d-flex align-items-center justify-content-between">
22           <div class="text-muted">Copyright &copy; Your Website 2020</div>
23           <div>
24             <a href="#">Privacy Policy</a>
25             &mdot;
26             <a href="#">Terms & Conditions</a>
27           </div>
28         </div>
29       </div>
30     </div>
31   </div>
32 </body>
33 </html>
```



c. Database Schema (if Applicable)

	last_login	is_superuser	username	first_name	email	is_staff	is_active	date_joined	last_name
DXA=	NULL	1	ishika			1	1	2021-07-19 07:49:43.793715	
XM=	2021-07-19 08:35:56.300129	0	DataFlair	Data	dataflair@gmail.com	0	1	2021-07-19 07:53:27.010905	Flair
Wp3mw5sUCz78=	2022-11-16 08:53:26.471540	0	Sabari3		sabarikishore0630@gmail.com	0	1	2022-11-15 09:52:10.026341	

id	content_type_id	codename	name
1	1	add_logentry	Can add log entry
2	1	change_logentry	Can change log entry
3	1	delete_logentry	Can delete log entry
4	1	view_logentry	Can view log entry
5	2	add_permission	Can add permission
6	2	change_permission	Can change permission
7	2	delete_permission	Can delete permission
8	2	view_permission	Can view permission
9	3	add_group	Can add group
10	3	change_group	Can change group
11	3	delete_group	Can delete group
12	3	view_group	Can view group
13	4	add_user	Can add user
14	4	change_user	Can change user
15	4	delete_user	Can delete user

File Edit Selection View Go Run Terminal Help ExpenseTracker

EXPLORER

- OPEN EDITORS
- EXPENSETRACKER
- OUTLINE
- TIMELINE
- SQLITE EXPLORER
 - db.sqlite3
 - auth_group
 - auth_group_permissions
 - auth_permission
 - auth_user
 - auth_user_groups
 - id: integer
 - user_id: integer
 - group_id: integer
 - auth_user_user_permissions
 - django_admin_log
 - django_content_type
 - django_migrations
 - django_session
 - home_addmoney_info
 - id: integer
 - add_money: varchar(10)
 - quantity: bigint
 - Date: date
 - Category: varchar(20)
 - user_id: integer
 - home_userprofile
 - id: integer
 - profession: varchar(10)

SQLITE

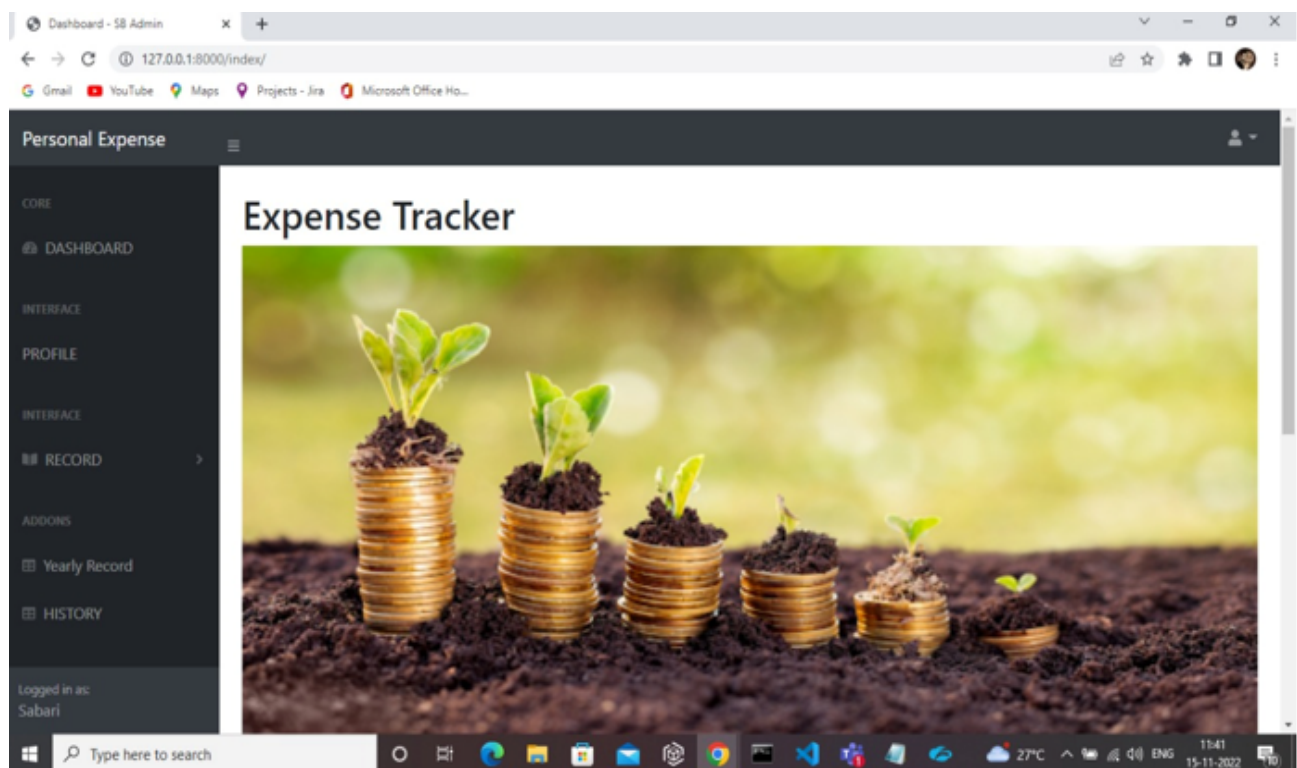
12	3	view_group	Can view group
13	4	add_user	Can add user
14	4	change_user	Can change user
15	4	delete_user	Can delete user
16	4	view_user	Can view user
17	5	add_contenttype	Can add content type
18	5	change_contenttype	Can change content type
19	5	delete_contenttype	Can delete content type
20	5	view_contenttype	Can view content type
21	6	add_session	Can add session
22	6	change_session	Can change session
23	6	delete_session	Can delete session
24	6	view_session	Can view session
25	7	add_userprofile	Can add user profile
26	7	change_userprofile	Can change user profile
27	7	delete_userprofile	Can delete user profile
28	7	view_userprofile	Can view user profile
29	8	add_addmoney_info	Can add addmoney_info
30	8	change_addmoney_info	Can change addmoney_info
31	8	delete_addmoney_info	Can delete addmoney_info
32	8	view_addmoney_info	Can view addmoney_info

Go Live 14:34 16-11-2022

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9. TESTING

- a. Test Cases
- b. User Acceptance Testing



10.RESULTS

Daily spending tracking can not only help you save money, but it can also help you set financial objectives for the future. If you know exactly where your money goes each month, you can quickly see where you can make some savings and compromises. We have designed a project that is more efficient than other income and expense trackers. The project succeeds in avoiding manual calculations for estimating monthly revenue and expenses. The modules have been designed to be both efficient and appealing

a. Performance Metrics

Daily spending tracking can not only help you save money, but it can also help you set financial objectives for the future. If you know exactly where your money goes each month, you can quickly see where you can make some savings and compromises. We have designed a project that is more efficient than other income and expense trackers. The project succeeds in avoiding manual calculations for estimating monthly revenue and expenses. The modules have been designed to be both efficient and appealing

11. ADVANTAGES Easy to use and effect

12. CONCLUSION

We now present and discuss the limitations of the new product, issues faced, and the remedies to those limitations. While building this expense tracking software tool, the major focus was to make this tool less user intensive and more user productive. The first version of this application is only applicable to the USA. It could have been used in other countries if I would have used currency converters in the application, which I will improvise in the later version. Certain issues were faced while implementing this tool and various important things were kept in mind. For example, the user interface is designed simple yet creative so that the user doesn't face any difficulty in using the software tool and the expense data is persisted on the device even if the user deletes the application from the memory background.

Core Data was chosen over SQLite to persist the data which is very beneficial even though the

data would reside on the device locally. iCloud functionality is missing. This would allow data to be saved to a Cloud and shared between various devices. The application lacks the feature of PDF by which the list of expenses and amount could

13.FUTURE SCOPE

- In this paper, a rich model's design and implementation are discussed, allowing third-party cloud apps to access a client's virtual machines (VMs) and carry out privileged operations. The infrastructure support required to support cloud apps was discussed. Different design approaches to deploy cloud apps were also addressed. Various examples were used to demonstrate and assess the practicality of cloud applications.
- In order to address the primary financial issues, this study looked at the potential usefulness of the mobile application "Manage on Money (MoM)". OCR technology was created using Google Cloud Vision API. This technique works well for locating a single precise keyword on a receipt printed in black ink. MoM enables users to arrange their recurring expenses and sends a push reminder prior to the due date. OneSignal API serves as the foundation for this notification.
- This application allows the user to enter their income to determine their daily expenses, and the results are saved for each user. The application has a feature that uses data mining to predict the manager's income and expenses. The suggested system takes less time to process, and all the information is updated and processed right away.

14.APPENDIX Source Code

GitHub & Project Demo Link

<https://github.com/IBM-EPBL/IBM-Project-4914-1658742869>