NALAIYA THIRAN PROJECT BASED LEARNING ON PROFESSIONAL READLINESS FOR INNOVATION, EMPLOYNMENT AND ENTERPRENEURSHIP

Personal Expense Tracker Application

A PROJECT REPORT

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

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INTRODUCTION

PROJECT OVERVIEW

Category: Cloud App Development
Team ID: PNT2022TMID02226

Skills Required:

IBM Cloud, HTML, CSS, JavaScript, IBM Cloud Object Storage, Python Flask, Kubernetes, Docker, IBM DB2, IBM Container Registry

Project Description:

The daily Expense Tracker System is designed to keep a track of the Income   Expense of an organization on a day-to-day basis. This System divides the income based on daily expenses. They have an option to set a limit for the amount to be used for that particular month if the limit is exceeded the user will be notified with an email alert. Daily expense tracking System will generate a report at the end of the month to show Income-Expense graph. By using this application, we can reduce the manual calculations of the daily expenses and keep track of the expenditure. Expense management software allows administrators to have full visibility of and track employee use of business financial resources. Expense management software analyzes overall expenses, identifies cost saving opportunities, and controls excessive spending." Expense Tracker" is developed to manage the daily expenses in a more efficient and manageable way.

PURPOSE

Managing pay up then debts has been a true problem for a long time. People are much less in all likelihood in accordance with preserve song about their spending, stand it, in checkbook yet even spreadsheets. Despite that, because of the current decades, it has acquired a latter perspective with the advent of modern 4 technologies yet the internet is turning into extra yet more accessible. For example, like how much it expenses for monthly and what are the expenses for a month. Some of the expense features like food expenses billing expenses like phone, electricity, taxation and some other personal expense. In this fast-moving world this web application will be very useful for a people who was a family and especially for a business people. Budgeting is an integral part of the society. Budget Tracking involves recording and analyzing the incomes and expenses of a person or an organization over a particular period of time. Daily Expense Tracker helps in accordance with maintain the document regarding daily costs yet month-to-month income because someone person or additionally generates a month-to month file over the expenses. This Project will save time and provide a responsible lifestyle. This system is made and supervised by the experts and satisfying by the user. The expense tracker will help any organization to deal with all their expenses more efficiently. By using software for managing expense tracking will help to control unnecessary expenses. There are several benefits and advantages of using online expense trackers, expense tracking makes any organization run faster and smoother.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

In existing, we need to maintain the Excel sheets, CSV etc. files for the user daily and monthly expenses. In existing, there is no as such complete solution to keep a track of its daily expenditure easily. To do so a personas to keep a log in a diary or in a computer, also all the calculations needs to be done by the user which may sometimes results in errors leading to losses. 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. Unraveling the complexity of your financial records by hand may be time consuming. Since it takes time to generate reports.

2.2 REFERENCES

1. "Expense Tracker", Miriam Thomas, Lekshmi.P, Dr.T.Mahalekshmi , year: 2020

2. "Expenditure management system", Dr.V.Geetha, G. Nikhitha. Year: 2022

3. "D2D Expense tracker application", Anjali Kumara, Utkarsh Raj. Year:2021

4. "Tracking Expenses by Commodity at Widget Farmers Cooperative", Ramasam. Year:2004

5." Expense tracker" Atiya Kazi, Praphulla.S. year: 2020

2.3 PROBLEM STATEMENT DEFINITION

Due to the busy and hectic lifestyle people tend to overlook their budget and end up spending an excessive amount of money since they usually didn't plan their budget wisely. Therefore, user cannot predict future expenses. While writing down their expenses or managing them in excel spreadsheet, their lack of knowledge in managing finances will be a problem. Personal Expense Tracker helps the user to manage their expenses and aids in overall budgeting. The main objective of this project is support to the user to sustain all financial activities like digital automated dairy. This application helps the user to avoid unexpected expenses and bad financial situations.

3.IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP

3.2 IDEA ON & BRAINSTORMING

2

Brainstorm

To create and design an app for users to keep track on thier expenses on a daily and monthly basis

⏱ **10 minutes**

DEEPTHI P

add all the expenses into an customised app	remind constantly through notification	generate monthly reports
create attractive user interface		

PRASEETHA P

Track expenses on the basis of daily, weekly and monthly	Get alert on over spending	change monthly limit as per requirements
create a secure application		

NIVETHA B

Get due bills remainders	Categorization of income/expense	Chart Visualization
Keep record data safe with local backups.Restore them if necessary.		

NESIGAN ML

Categorise different types of expenses	Perform Trend Analysis	Separate categories using colour labels
Pop up Notification for remainders		

− ⚪ + 42

⚙ Navigation Settin

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

⏱ **20 minutes**

Track Expense
1.Add all the expenses in a customized app.
2.Categorization of income/ expense
3.Track expenses on the basis of daily, weekly and monthly
4.Categorise different types of expenses

Data Privacy and Security
1.create a secure application
2 Keep record data safe with local backups.Restore them if necessary.

Remainders
1.remind constantly through notification
2.Get alert on over spending
3.Get due bills remainders
4.Pop up Notification for remainders

Simple user interface
1.create attractive user interface.
2.Chart Visualization.
3.Separate categories using colour labels

Reports
1.generate monthly reports
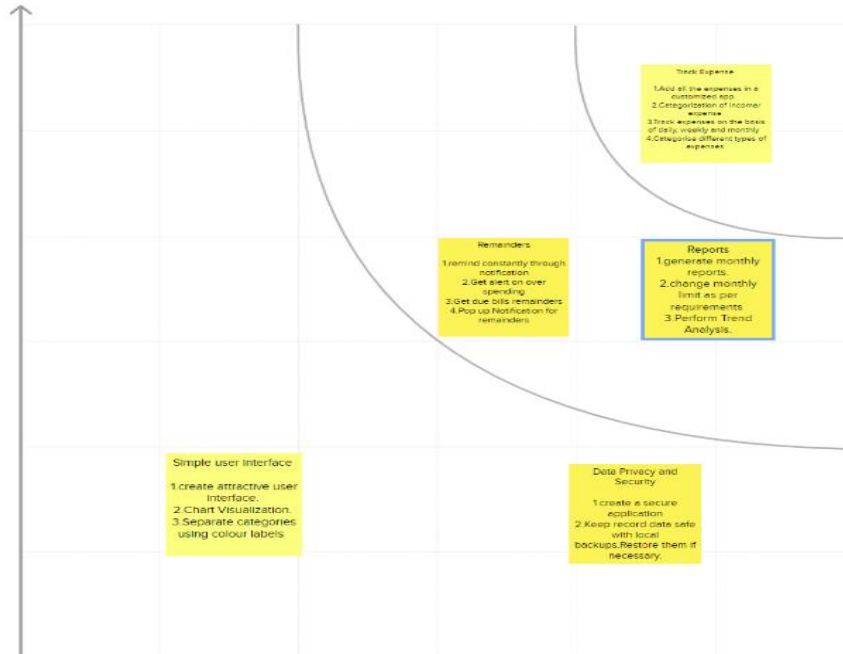2.change monthly limit as per requirements
3.Perform Trend Analysis.

4

Prioritize

The ultimate aim is to create a user and hazzle friendly app that keeps track on the daily and monthly expenses of an individual , send reports regularly , notifry when there is an exceedance of budget and to keep data records safe with backup.

⏱ 20 minutes

Track Expense

1.Add all the expenses in a customized app.
2.Categorization of income/ expense
3.Track expenses on the basis of daily, weekly and monthly.
4.Categorise different types of expenses

Reminders

1.remind constantly through notification
2.Get alert on over spending
3.Get due bills remainders
4.Pop up Notification for remainders

Reports

1.generate monthly reports.
2.change monthly limit as per requirements
3.Perform Trend Analysis.

Simple user Interface

1.create attractive user interface.
2.Chart Visualization.
3.Separate categories using colour labels

Data Privacy and Security

1.create a secure application
2.Keep record data safe with local backups.Restore them if necessary.

3.3 PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Due to the busy and hectic lifestyle people tend to overlook their budget and end up spending an excessive amount of money since they usually didn't plan their budget wisely. Therefore, user cannot predict future expenses. While writing down their expenses or managing them in excel spreadsheet, their lack of knowledge in managing finances will be a problem.
2.	Idea / Solution description	A personal expense tracker which keeps track on your daily expenses. This application keeps a check on all the expenses the user spends, fix a budget and sends a notification if it exceeds, compare the expenses spent for each category and gives a monthly report too.
3.	Novelty / Uniqueness	Personal expense tracker allows financial transactions through debit cards, bank transfers, credit cards, and net banking will help you make payments quickly against the invoices. It will also send reminders for payments and match the payments to customer accounts. It has bot that can understand and answer all user queries and address their needs such as account balance, credit score, etc.
4.	Social Impact / Customer Satisfaction	Through our application every user in the society will be self aware of how much he/she spends from their pocket and this will get to save money when they know their budget.
5.	Business Model (Revenue Model)	Freemium/upselling in which a user may access the application for free, but will be charged for additional functions, services, bonuses, plugins, or extensions. Advertisemnet-based revenue model which will make use of traffic (audience), to place ads. The ads in turn will generate revenue that a application will use to cover its maintenance costs and staff salaries, leaving the profit.
6.	Scalability of the Solution	Personal Expense Tracker is capabale of handling huge number of user data and API calls simultaneously. It has a feature where the user can create a family account for family expenes, which includes each person's expense as a whole, excluding personal expenses. The freedom of choosing this personal expense helps maintain privacy of the individual. The Family account supports additional users with a limit of 10. If exceeds 10 members for an account, the Business account comes in handy. Business account accomadates some basic functions of accounting for the provided firm.

3.4 PROBLEM SOLUTION FIT

Problem-Solution fit canvas 2.0   Purpose / Vision

1. CUSTOMER SEGMENTS `CS` Self-Employed People Normal People	**6. CUSTOMER** `CC` network connection available devices	**5. AVAILABLE SOLUTIONS** `AS` Use paper or sticky notes ,Excel Sheets, create ledger Cons: paper or Sticky notes are not easy to manage Excel Sheets do very little to help in tracking expenses
2. JOBS-TO-BE-DONE / PROBLEMS `J&P` 1.As people are busy in their daily routine ,they are not able to keep track of their expenses 2. Manual calculation of income & expenses	**9. PROBLEM ROOT CAUSE** `RC` Maintaining Financial Control Holding Yourself Accountable	**7. BEHAVIOUR** `BE` Use Excel sheets ,paper Create ledger

Define CS, fit into CC · *Focus on J&P, tap into BE, understand RC* (left side)

Explore AS, differentiate · *Focus on J&P, tap into BE, understand RC* (right side)

3. TRIGGERS `TR` Help you gain control of your personal and business finances. Categorize your purchases so you can spot areas where you can save money.	**10. YOUR SOLUTION** `SL` A complete visualized report of the expenses. Bill Remainders and popup notification of alerts specified. A complete history of monthly reports is available for users to examine their previous expenses. A Smart Investment Plan is provided to users.	**8. CHANNELS of BEHAVIOUR** `CH` **8.1 ONLINE** Inserts Expense data into the ledger provided by Personal Assistant Tracker.
4. EMOTIONS: BEFORE / AFTER `EM` Personal Expense Tracker improves commitment behaviour in users. It really shifts the user's life towards achieving their goals.		**8.2 OFFLINE** Recording of expenses made by the user and categorize it.

Identify strong TR & EM (left side) · *Extract online & offline CH of BE* (right side)

4.REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT

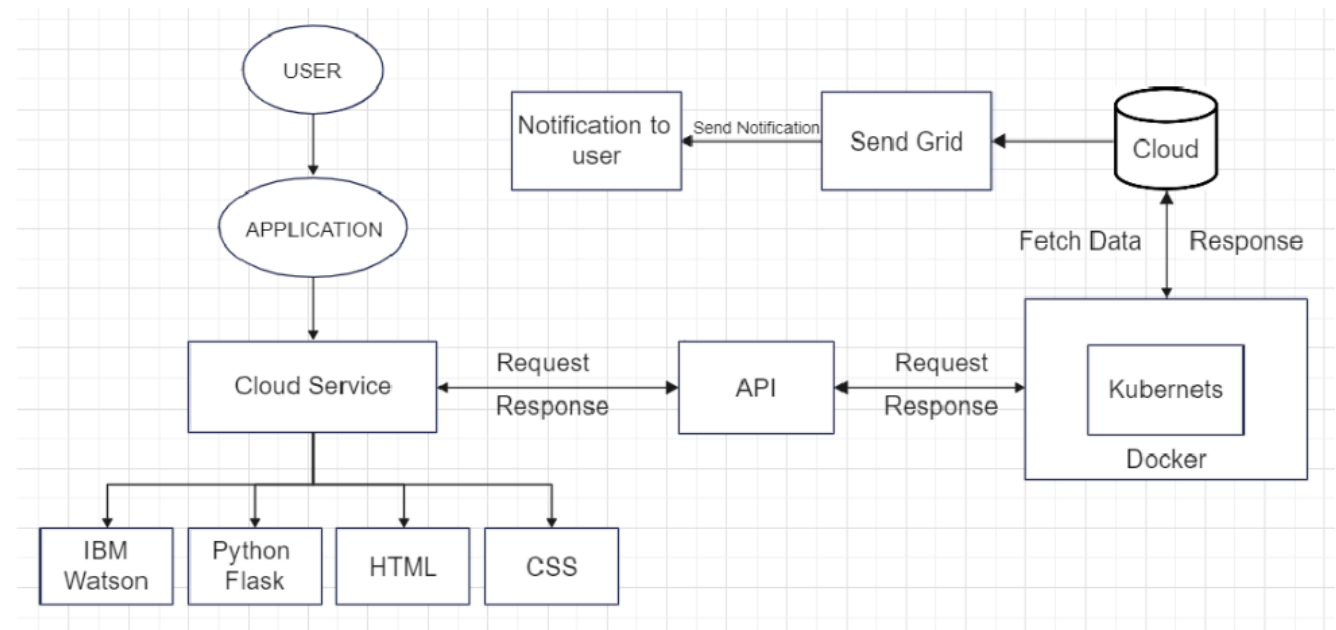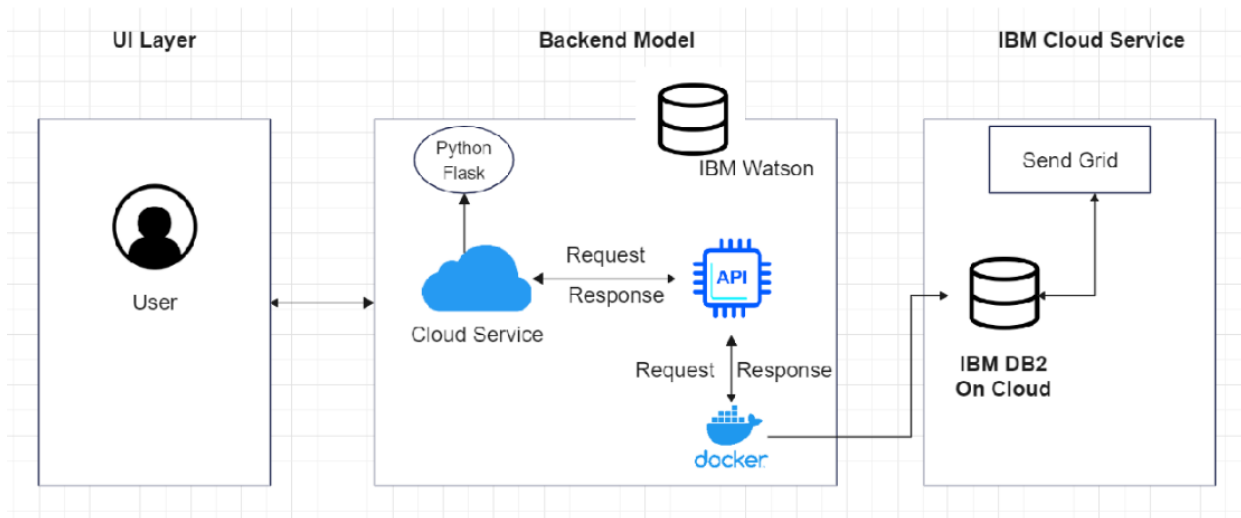| FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via CTP
FR-3	User Login	Login through Form Login through Gmail
FR-4	Wallet page	Update your monthly income
FR-5	Add expenditure	Mark your expenses with different categories and the app gives the total category wise.
FR-6	Budget Specification	Define the expense quota for each expenditure categories.

4.2 NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system should be very easy to use with minimal required training.
NFR-2	**Security**	User data is well authenticated.
NFR-3	**Reliability**	Highly reliable in a properly secured environment.
NFR-4	**Performance**	Efficiently engage users in budgeting discipline.
NFR-5	**Availability**	Available to all web users.
NFR-6	**Scalability**	A company or a group of users can create an org /family account.

5.PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS
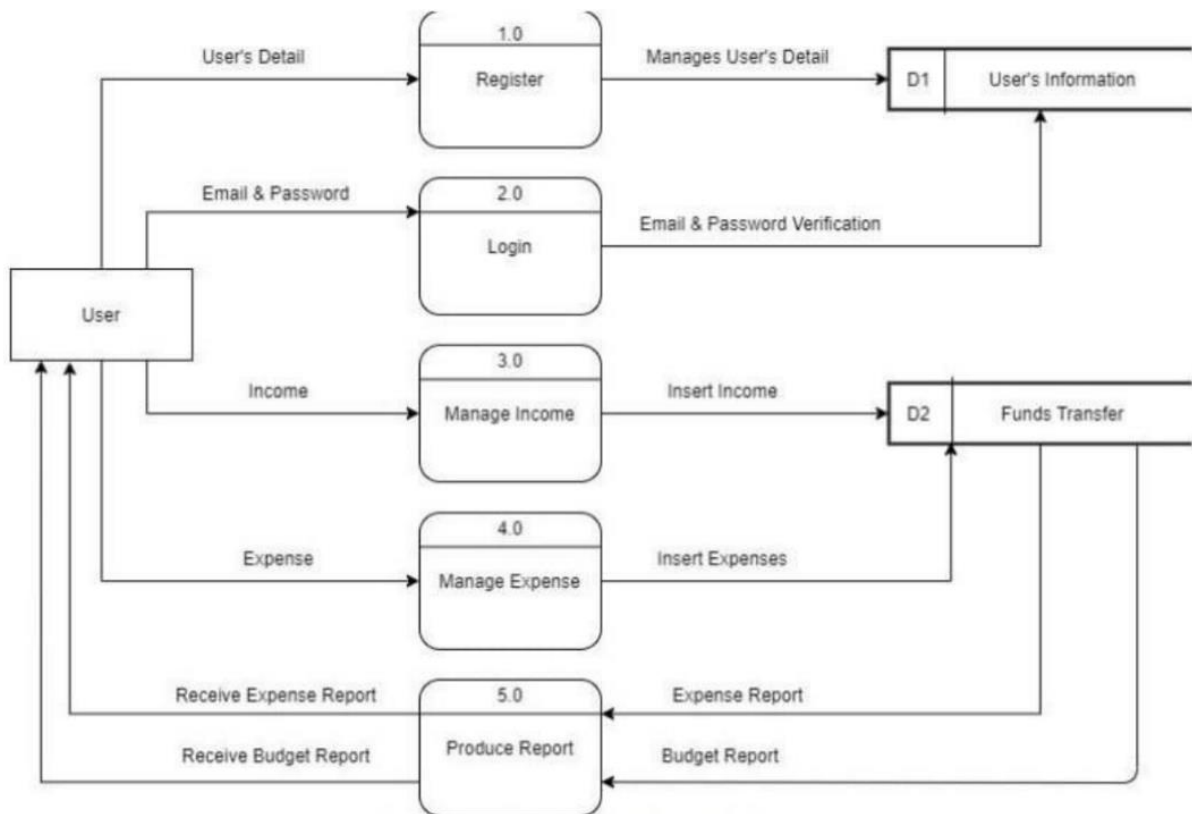
5.2 SOLUTION & TECHNICAL ARCHITECTURE

5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (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	Sprint-1
		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	Sprint-1
	Login	USN-3	As a user, I can log into the application by entering email & password		High	Sprint-1
	Dashboard	USN-4	As a user, I can change my password by receiving a change password link	I can receive confirmation of change password & click confirm	Low	Sprint-1
		USN-5	As a user, I can add my financial status and update it regularly	Wallet information is updated	High	Sprint-1
		USN-6	As a user, I can update my daily expenditure	Expenditure information is updated	High	Sprint-1
		USN-7	As a premium user, I can avail the Smart Investment feature		Medium	Sprint-2
Administrator	Management	USN-1	As an administrator I can manage user data and premium users		High	Sprint-1

6.PROJECT PLANNING & SCHEDULING

6.1 SPRINT PLANNING & ESTIMATION

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password.	6	High	Team leader
Sprint-1	Login	USN-2	As a user, I can log into the application by entering email & password	6	High	Team Member 3
Sprint-1	Change Password	USN-3	As a user, I can change my password	4	Medium	Team leader, Team member 2
Sprint-1	Confirmation	USN-4	As a user, I will receive confirmation email once I have registered for the application	4	Medium	Team Member 2, Team Member 3
Sprint-2	Dashboard	USN-5	As a user,I can view dashboard and select	10	High	Team leader, Team Member 2
Sprint-2	Add Expense	USN-6	As a user, I can add my financial status	5	High	Team Member 1, Team Member 3
Sprint-2	Update Expense	USN-7	As a user, I can update by daily expenditure	5	High	Team leader, Team Member 3
Sprint-3	Manage data	USN-8	As an admin ,I can manage user data and premium user data	8	High	Team leader, Team Member 3
Sprint-3	Notifications	USN-9	As a user, I will receive notifications when my expense crosses the limit.	8	High	Team Member 2, Team Member 3
Sprint-3	Expense History	USN-10	As a user, I can track the history of expenses made.	4	Medium	Team Member 1, Team Member 3
Sprint-4	Smart Investment	USN-11	As a premium user, I can avail the Smart Investment feature	10	High	Team Member 1
Sprint-4	Graph Visualization	USN-12	As a user, I can visualize my history of expenses.	10	High	Team Member 2

6.2 SPRINT DELIVERY SCHEDULE

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	19 Nov 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	19 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	19 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 teams average velocity (AV) as per iteration unit (story points per day)

AV = Sprint duration/velocity = 20/10 = 2

AV = 20/6 = 3.3333…

Sprint 1(AV) = 3.34

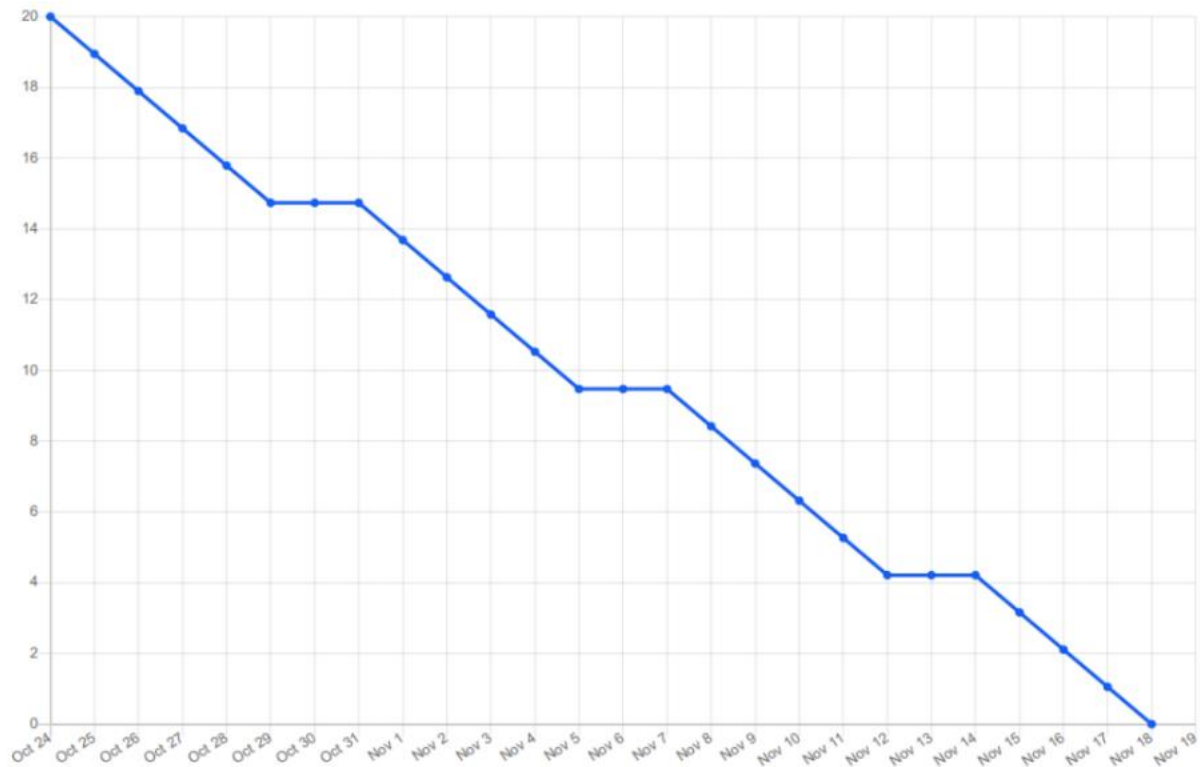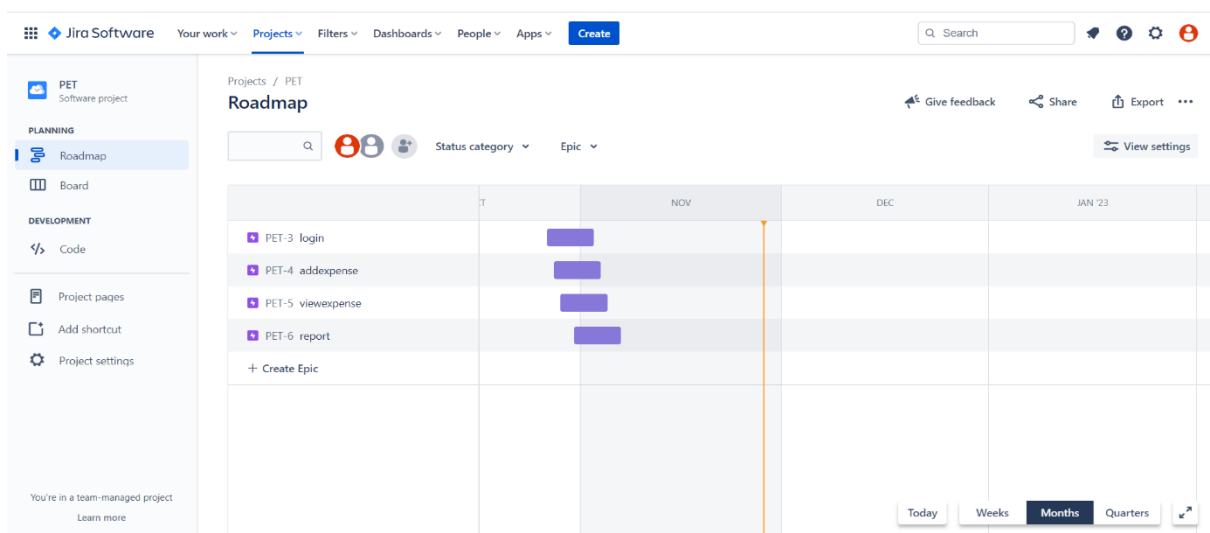Sprint 2(AV) = 3.34

Sprint 3(AV) = 3.34

Sprint 4(AV) = 3.34

Burndown Chart:

A burndown chart is a graphical representation of work left to do, reduces time. It often used in agile software development methodologies such as scrum. However, burn down charts can be applied to any project containing measurable progress over time.

6.3 REPORTS FROM JIRA

7. CODING & SOLUTIONING

7.1 Feature 1

- Login.html

```html
<!DOCTYPE html>
<html lang="en" dir="ltr">
    <head>
        <meta charset="utf-8">
        <title>Personal Expense Tracker</title>
        <link rel="stylesheet" href="{{ url_for('static', filename='css/style.css')
}}">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <div class="wrapper">
            <div class="title-text">
                <div class="title login">
                    Login Form
                </div>
                <div class="title signup">
                    Signup Form
                </div>
            </div>
            <div class="form-container">
                <div class="slide-controls">
                    <input type="radio" name="slide" id="login">
                    <input type="radio" name="slide" id="signup">
                    <label for="login" class="slide login">Login</label>
                    <label for="signup" class="slide signup">Signup</label>
                    <div class="slider-tab"></div>
                </div>
                <div class="form-inner">
                    <form action="#" class="login">
                        <div class="field">
                            <input type="text" placeholder="Email Address" name="email"
required>
                        </div>
                        <div class="field">
                            <input type="password" placeholder="Password" name =
"password" required>
```

```html
                    </div>
                    <div class="pass-link">
                        <a href="#">Forgot password?</a>
                    </div>
                    <div class="field btn">
                        <div class="btn-layer"></div>
                        <input type="submit" value="Login">
                    </div>
                    <div class="signup-link">
                        Not a member? <a href="">Signup now</a>
                    </div>
                </form>
                <form action="http://localhost:8080/IP/A"
method="post"class="signup">
                    <div class="field">
                        <input type="text" placeholder="Email Address" name =
"email" required>
                    </div>
                    <div class="field">
                        <input type="password" placeholder="Password" name =
"password" required>
                    </div>
                    <div class="field">
                        <input type="password" placeholder="Confirm password" name =
"cpassword" required>
                    </div>
                    <div class="field btn">
                        <div class="btn-layer"></div>
                        <input type="submit" value="Signup">
                    </div>
                </form>
            </div>
        </div>
    </div>
    <script>
        const loginText = document.querySelector(".title-text .login");
        const loginForm = document.querySelector("form.login");
        const loginBtn = document.querySelector("label.login");
        const signupBtn = document.querySelector("label.signup");
        const signupLink = document.querySelector("form .signup-link a");
        signupBtn.onclick = (()=>{
            loginForm.style.marginLeft = "-50%";
            loginText.style.marginLeft = "-50%";
        });
        loginBtn.onclick = (()=>{
```

```
                loginForm.style.marginLeft = "0%";
                loginText.style.marginLeft = "0%";
            });
            signupLink.onclick = (()=>{
                signupBtn.click();
                return false;
            });
        </script>
    </body>
</html>
```

AddExpense.html

```
{% extends "layout.html" %}

{% block styles %}
        <link href="/static/css/expenses.css" rel="stylesheet">
{% endblock %}

{% block title %}
    Add Expenses
{% endblock %}

{% block main %}
    <h1>Add Expenses</h1>
    <br>
    <p><small>Tip: Delete a row by clicking/tapping the row number in the '#'
column and then clicking/tapping the 'Delete Row' button. Must have at least 2
rows.</small></p>

    <form action="/addexpenses" method="post" id="expenseForm"
autocomplete="off">
        <input type="hidden" name="csrf_token" value="{{ csrf_token() }}" />
        <div class="table-responsive-sm">
        <table id="expenseTable" class="table table-hover">
          <thead>
            <tr>
              <th scope="col">#</th>
              <th scope="col">Description</th>
              <th scope="col">Category</th>
              <th scope="col">Date</th>
              <th scope="col">Payer</th>
              <th scope="col">Amount</th>
```

```html
            </tr>
          </thead>
          <tbody>
            <tr>
              <td onclick="selectRow(this);">1 <i class="far fa-hand-
pointer"></i><br>
              </td>
              <td>
                <textarea class="form-control-sm" name="description.1"
form="expenseForm" required maxlength="200" autofocus></textarea>
              </td>
              <td>
                <select id="category" class="form-control-sm" name="category.1"
form="expenseForm" required>
                  {% for category in categories %}
                    <option value="{{ category['name'] }}">{{ category['name']
}}</option>
                  {% endfor %}
                </select>
              </td>
              <td>
                <input type="date" class="form-control-sm" name="date.1"
form='expenseForm' required value="{{ date }}">
              </td>
              <td>
                <select class="form-control-sm" name="payer.1"
form="expenseForm" required>
                  <option value="Self">Self</option>
                  {% for payer in payers %}
                  <option value="{{ payer['name'] }}">{{ payer['name']
}}</option>
                  {% endfor %}
                </select>
              </td>
              <td>
                <!-- Modified RegEx from Gary @ StackOverflow:
https://stackoverflow.com/a/16242575 -->
                <!-- TODO: change input type from 'text' to 'number' to remove
the need for regex? Look at my implementation on budgets.html and use the same
thing here -->
                <input type="text" class="form-control-sm" name="amount.1"
form='expenseForm' size="10" placeholder="$" required maxlength="10"
pattern="(?=.*?\d)^(([1-9]\d{0,2}(\d{3})*)|\d+)?(\.\d{1,2})?$" title="Format must
be currency value without dollar sign or commas e.g. 1, 2.50, 1500.75">
              </td>
```

```
            </tr>
          </tbody>
        </table>
        </div>
        <br>
        <button type="button" id="btnNewRow" class="btn btn-primary"
onclick="addRow();">New Row</button>
        <button type="button" id="btnDeleteRow" class="btn btn-danger"
onclick="removeRow(selectedRow);" disabled>Delete Row</button>
        <button type="submit" id="btnExpense" class="btn btn-
success">Save</button>
    </form>
    <br>

    <script src="/static/js/addexpenses.js"></script>
    <script>
      var categoryData = JSON.stringify({{ categories | tojson }});
      var dateData = "{{ date }}";
      var payersData = JSON.stringify({{ payers | tojson }});

      loadData(categoryData, dateData, payersData);
    </script>
{% endblock %}
```

Database:

CREATE FUNCTION FUNCTION1 (VARNAME VARCHAR(128))

   RETURNS INTEGER

   NO EXTERNAL ACTION

 F1: BEGIN ATOMIC

--

###

#

-- # Returns count of all tables created by and VARNAME

--

##

#

 RETURN

  SELECT COUNT(*)

   FROM SYSIBM.SYSTABLES

   WHERE CREATOR = '' AND NAME = VARNAME@INNER_TERMINATOR

END@OUTER_TERMINATOR

9. RESULTS

● Reports:

The expense tracking app generates and sends reports to give a detailed insight about

profits, losses, budgets, income, balance sheets, etc.,

● 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.

● Latency:

Personal Expense Tracker application deployed on the IBM Kubernetes Cluster offers up

to 150 - 200ms in the average traffic and 200 -250ms in the stressed loaded

environment with Ngnix container acting as the service in the cluster.

●No. of Failures:

Personal Expenses Tracker Application is designed in such a way that it can handledifferent

 input and respond accordingly. The application is aggressively tested with

different test cases so that it reduces the rate of failure up to 0.75%

10. ADVANTAGES AND DISADVANTAGES ADVANTAGES:

Advantage:

1.Improved visibility: Most expense management software includes a dashboard that compiles employee expense data and presents it in an easy-to-understand visual format using charts and other graphics.

2.Security: All the Data's are stored in ibm cloud and db2 so all the data are maintained safely.

3.Month wise Comparison: Using the Expense Manager, you can easily make month on month comparisons of earning, expenses and spending in a more organized manner.

4.Alert Mail: User Receives the alert mail when they exceed the expense limit.

5.Automation: All the calculations are automated. Graph are generated based on the expense made.

6.User Friendly: Expenses can be added easily.

Disadvantages:

The financial aspect of an individual can be a important data which can harnessed both on advantageous and disadvantageous manner. The users can be exploited based on their economical behavior and the unauthorized access to others financial information can be critical violation to the privacy.

11. CONCLUSION

Daily Expense Tracker is a gadget that being developed to help customers in budget planning. It offers end customers to file their earnings and costs within the finances that have been planned beforehand. Furthermore, customers are capable to hold song on their spending so they are not wasting their money barring doubt. Last however clearly not the least, they are able to get right of entry to the gadget anytime and anywhere that. After making this application we guarantee that this software will assist its customers to manipulate the value of their daily expenditure. It will show to be beneficial for the human beings who are pissed off with their dayby-day price range management, because of amount of costs and needs to control cash and to preserve the report of each day fee which may also be useful to trade their way of spending money. In short, this application will help its customers to overcome the wastage of money.

12. FUTURE SCOPE:

1.User can able to upload the receipt of their expenses made.

2.Application will make suggestion to reduce unnecessary expense.

3.User get remainder in email to add their daily expense.

4.User can able to link bank accounts with our application.

13.APPENDIX:

GitHub Source code link:

https://github.com/IBM-EPBL/IBM-Project-23379-1659881406