IT 314 – Lab 04

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Tools, Technologies, and Framework

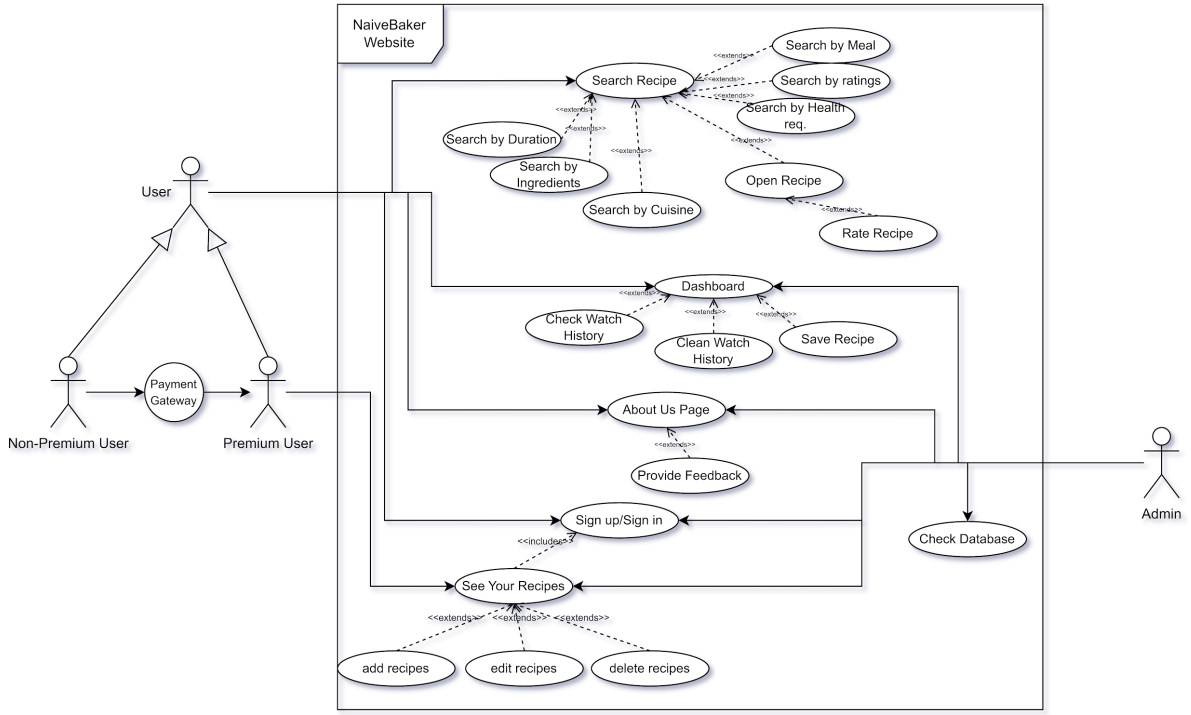
- **VS Code**
  - IDE to help us connect to github and maintain the project files while working on it.
- **GitHub**
  - A version control system to help us maintain the project while collaborating with the entire team.
- **React**
  - React is a JS framework for front-end. It is helpful in creating fast single page applications for small-to-medium sized projects.
  - It also provides support for excellent code readability.
- **MongoDB**
  - Since NoSql is required, MongoDB is the best option available. The Document Data Model of MongoDB is a powerful way to store and retrieve data.
  - Also the MongoDB is available in many major public clouds.MongoDB provides a good user experience and also provides a good scalable architecture
- **Chrome DevTools**
  - It provides us the tool to inspect and fix the errors in our code.
  - It helps us analyse the performance of our webpage.
  - It helps us to check the responsiveness of the page on different devices and browsers.
- **Bootstrap**
  - Since bootstrap contains basic boilerplate code, it becomes easier to code quickly and save time. It helps us to make our website responsive.
- **CodePen**
  - It provides the developers with functions to test and run our code (ex. HTML, CSS, JavaScript, etc.) directly without uploading the website on the browser.

➢ **Node.js :**

- Node.js is a back-end JavaScript runtime environment which is used for allowing developers to code applications and also to run them simultaneously.
- In combination with React and MongoDB, Node.JS is one of the best used backend tools.

Use Case Diagram

We use following use case diagram for performing effort estimation



Effort Estimation

The project consists of several functionalities. Their applicable roles and weightage for effort estimation can be seen in the table below:

Use Case	Applicable Role	Description	Weightage
Sign in / Sign up	User, Admin	**User**: User can sign in or sign up into their account. **Admin** : It can login to only his account.	1
Add recipes	Premium user, admin	**User**: a premium user can upload new recipes they created. **Admin**: admin can also upload new recipes	3
Edit recipes	Premium user, admin user	**User**: user can edit the recipes (s)he uploaded **Admin**: can edit all the recipes present in the database.	3
Delete recipes	Premium user admin	**Premium user :** They can delete only the recipes they uploaded from their account. **Admin :** They can delete any recipe which he does not find suitable.	1
Provide Feedback	User, admin	**User :** They can provide feedback . **admin :** They have access to all feedback ,given by the user .	1
Check watch history	User	**User**: User can check his/her previously watched videos	3
Clean watch history	User	**User:** User can clean his/her previously watched videos.	1
Save recipes	User	**User:** User can save the recipes which they like and prefer.	1

Use Case	Applicable Role	Description	Weightage
Search Recipe	User	**Users**: They can search recipes based on various filters. → Non-premium users have limited daily search access	5
Open Recipe	User	**Users**: They can open a recipe searched to view its contents in detail	3
Rate Recipe	User	**Users**: They can rate a recipe they are viewing	1
Check database	Admin	**Admin:** They can check/maintain the database to prevent inappropriate contents in the database and remove certain inappropriate users if needed.	5

Unadjusted Use Case Weight (UUCW)

Based on the above effort estimation, we can estimate the time assuming we assign 3 person-hours per function-point.

	Weightage	total function points	Total
Complex	5	2	10
Medium	3	4	12
Simple	1	6	6
Functional Total Points			28
Estimated Effort defined per point			3
Total Estimated Effort (Person-Hour)			84

Unadjusted Actor Weight (UAW)

Actor Complexity	Actor Weight	Number of Actors	Product
Simple	1	0	0
Average	2	1	2
Complex	3	3	9

We have 3 complex actors (Premium user, Non Premium user and admin) and an average actor (database).

So we have,
UAW = (Total No. of Simple actors x 1) + (Total No. Average actors x 2)
+ (Total No. Complex actors x 3)

UAW = (0*1) + (1*2) + (3*3)
= 11

Technical Complexity Factor (TCF)

Estimated size of the software in order to account for technical considerations of the system.

Factor	Description	Weight (W)	Rated Value (0 to 5) (RV)	Impact (I = W × RV)
T1	Response time or throughput performance objectives	1.0	3	3
T2	End user efficiency	1.0	2	2
T3	Complex internal processing	1.0	2	2

T4	Code must be reusable	1.0	4	4
T5	Easy to use	0.5	4	2
T6	Easy to change	1.0	4	4
T7	Concurrent/parallel processing	1.0	3	3
T8	Includes special security objectives	1.0	1	1

Total Technical Factor (TF) = Sum of Impact of all the Factors
= 23

Technical Complexity Factor (TCF) = 0.6 + (0.01 × TF)
= 0.6 + (0.01 ×23)
= 0.60 + 0.23
= 0.83

Environmental Complexity Factor (ECF)

Estimated size of the software in order to account for environmental considerations of the system.

Factor	Description	Weight (W)	Rated Value (0 to 5) (RV)	Impact (I = W × RV)
E1	Familiar with the development process	1.5	3	4.5
E2	Application experience	0.5	2	1
E3	Object-oriented experience	1	4	4
E4	Lead analyst capability	0.5	3	1.5

E5	Motivation	1	5	5
E6	Stable requirements	2	4	8
E7	Difficult programming language	-1	2	-2

→ **Total Environmental Factor** (EF) = Sum of impact of all the factors = 22

→ **ECF** (Environmental Complexity Factor) = 1.4 + (-0.03 x EF)
= 1.4 + (-0.03 x 22)
= 1.4 - 0.66
= 0.74

USE CASE POINTS (UCP)

UCP are the adjusted use case points.
UCP = (UUCW + UAW) x TCF x ECF
UCP = (84 + 11)*0.81*0.74
UCP = 56.943

- ➢ Approximately considering 3 man-hours per use case point,
- ➢ Estimated Effort = UCP x Hours/UCP
= 56. 943 * 3 = 171

REFERENCES:

https://en.wikipedia.org/wiki/Use_case_points#:~:text=Use%20case%20points%20%28UCP%20or,the%20software%20design%20and%20development