

IT - 314 Software Engineering

LAB - 4 Specifying Tools and Technology

Group - 21

Renting System

Finalized Tools, Technology, and frameworks:

❖ VS Code

- Using an IDE, we can maintain track of the project files as we work on it by connecting to Github.

❖ GitHub

- We need a version control solution to keep the project up to date while working with the full team.

❖ React

- A front-end JS framework is called react. Small- to medium-sized projects can benefit from it since it speeds up the construction of single-page apps.
- It also provides support for code readability.

❖ MongoDB

- MongoDB is the best option since NoSql is necessary. MongoDB's Document Data Model is a powerful method for storing and retrieving data.
- Moreover, MongoDB is accessible in a number of significant public clouds. It offers an excellent user experience and a good scalable architecture.

❖ **Chrome DevTools**

- It provides us the tool to inspect and fix the errors in our code.
- It assists us in evaluating the effectiveness of our website.
- It aids in testing the website's responsiveness across various browsers and devices.

❖ **Bootstrap**

- Bootstrap includes simple boilerplate code, making it quicker and more efficient to develop. It aids in the responsiveness of our website.

❖ **CodePly**

- It gives programmers the ability to test and use our code (such as HTML, CSS, JavaScript, etc.) without having to submit the website to the browser.

❖ **Node.js :**

- A back-end JavaScript runtime environment called Node.js is utilized to enable developers to create and run apps concurrently.
- One of the most popular backend tools is Node.JS, along with React and MongoDB.

❖ **Use Case classification based on complexity :**

Use case	Transaction	Use case complexity	Weightage
Sign in/Sign up	7	Average	10
Lending a product	4	Average	10
Search a product	4	Average	10
Add product to wishlist	3	Simple	5
Borrow a product	7	Average	10
Payment gateway	5	Average	10

❖ **Unadjusted Use-Case Weight (UUCW) :**

Use case Complexity	Use case weight	No. of use cases	Product
Simple	5	1	5
Average	10	5	50
Complex	15	0	0
Unadjusted Use-Case Weight (UUCW) :			55

❖ **Classification of Actor based on complexity:**

Actor	Actor Complexity	Actor Weight
Non-member	Complex	3
Lender	Complex	3
Borrower	Complex	3
Admin	Average	2
User Database	Simple	1
Product Database	Simple	1

❖ **Unadjusted Actor Weight (UAW) :**

Actor Complexity	Actor Weight	Number of Actors	Product
Simple	1	2	2
Average	2	1	2
Complex	3	3	9
Unadjusted Actor Weight (UAW) :			13

$$\begin{aligned}\text{Unadjusted Use-Case Points (UUCP)} &= \text{UUCW} + \text{UAW} \\ &= 55 + 13 \\ &= 68\end{aligned}$$

❖ **Technical Factors:**

Factor	Description	Weight (W)	Rated Value (RV) (0-5)	Impact (I = W * RV)
T1	Distributed system	2.0	0	0
T2	Response time or throughput performance objectives	1.0	3	3
T3	End user efficiency	1.0	4	4
T4	Complex internal processing	1.0	0	0
T5	Code must be reusable	1.0	5	5
T6	Easy to install	0.5	0	0
T7	Easy to use	0.5	5	2.5
T8	Portable	2.0	4	8
T9	Easy to change	1.0	4	4
T10	Concurrent	1.0	5	5
T11	Includes special security objectives	1.0	3	3
T12	Provides direct access for third parties	1.0	0	0
T13	Special user training facilities are required	1.0	0	0
Total Technical Factor (TFactor)				34.5

Technical Complexity Factor(TCF):

$$\begin{aligned} \text{TCF} &= 0.6 + (0.01 \times \text{TFactor}) \\ &= 0.6 + (0.01 \times 34.5) \\ &= 0.945 \end{aligned}$$

❖ Environmental Complexity Factors:

Factor	Description	Weight	Rated Value	Impact (I = W * RV)
E1	Familiar with the development process	1.5	4	6
E2	Application experience	0.5	4	2
E3	Object-oriented experience	1	3	3
E4	Lead analyst capability	0.5	2	1
E5	Motivation	1	4	4
E6	Stable requirements	2	4	8
E7	Part-time staff	-1	0	0
E8	Difficult programming language	-1	2	-2
Total Environment Factor (EFactor)				22

$$\begin{aligned}
 \text{ECF (Environmental Complexity Factor)} &= 1.4 + (-0.03 \times \text{EFactor}) \\
 &= 1.4 + (-0.03 \times 22) \\
 &= 0.74
 \end{aligned}$$

❖ USE CASE POINTS (UCP)

UCP are the adjusted use case points

$$\begin{aligned}
 \text{UCP} &= \text{UUCP} \times \text{TCF} \times \text{ECF} \\
 &= 68 \times 0.945 \times 0.74 \\
 &= 47.55
 \end{aligned}$$

- Approximating 4 man hours per use case point.
- **Estimated Effort= UCP x Hours/UCP**

$$= 47.55 \times 4$$

$$= 190.2 \text{ man hours.}$$