IT314

Lab4
Software Engineering
Winter Semester 2022-23

1. Tools and Technology

1. Front-End

We are planning to use HTML, CSSand JavaScript and also to make it responsive as well as beautiful. We are planning to use a designing framework like bootstrap.

2. Back-End

For the backend, We are planning to use the Node JS, as it is an open-source, cross-platform, back-end JavaScript runtime environment that executes JavaScript code outside a web browser and also provides ready made codes as well as efficient modules and easy database integration.

Node JS is widely used for the back-end of applications, like using Express. js to build the back-end of classic web applications. Also, it is used for server-side programming and non-blocking, event-driven servers like typical websites and backend API services.

3. Database

We are planning to use MongoDB as a NoSQL Database because it uses JSON to store data like documents that can vary in structure offerings, a dynamic, flexible schema. MongoDB is designed for high availability and Scalability with auto-sharding.

MongoDB has no schema hassles. You can place data into a NoSQL database without requiring a predefined schema, so you can change the data model and formats without disrupting applications. It's user-friendly.

MongoDB is a NoSQL (Not only SQL) database that stores large volumes of data in the form of documents. MongoDB removes the concept of "rows" of conventional and relational data models by introducing "documents." This offers the developers the flexibility to work with evolving data models.

4. IDE

We are planning to use an open-source IDE namely Visual Studio Code integrated with Github Co-pilot.

2. Effort Estimation Using Use Case Size Point

Unadjusted Use-Case Weight (UUCW)

Use-Case Complexity	Number of Transactions	Use-Case Weight
Simple	≤ 3	5
Average	4 to 7	10
Complex	> 7	15

Use case name	Number of transaction	Category
Post Job	2	Simple
Schedule	2	Simple
See Student Details	1	Simple
Send Notification	1	Simple
Prepare datasheet	1	Simple
View company details	2	Simple
Apply for jobs	2	Simple
Filter the companies	1	Simple
Manage profile	2	Simple
Download previous year company list	2	Simple
View placement statistics	2	Simple

Use-Case Complexity	Weight	Number of Use-Cases	Product
Simple	5	11	55
Average	10	0	0
Complex	15	0	0
Unadjusted Use-case Weight (UUCW)			55

Unadjusted Actor Weight (UAW)

Actor Complexity	Example	Actor Weight
Simple	A System with defined API	1
Average	A System interacting through a Protocol	2
Complex	A User interacting through GUI	3

Actor Name	Category	Weight
Company	Complex	3
Student	Complex	3
Visitor	Complex	3
Admin	Complex	3
Unadjusted Actor Weight (UAW)		12

Unadjusted Use Cast Point (UUCP)

Unadjusted Use Case Point = Unadjusted Actor Weight (UAW) + Unadjusted Use Case Weight (UUCW)

Unadjusted Use Case Point = 12 + 55

Unadjusted Use Case Point = 67

Technical Complexity

Factor	Description	Weight (W)	Rated Value (0 to 5) (RV)	Impact (I = W × RV)
T1	Distributed System	2.0	3	6.0
T2	Response time or throughput performance objectives	1.0	4	4.0
T3	End user efficiency	1.0	4	4.0
T4	Complex internal processing	1.0	3	3.0
T5	Code must be reusable	1.0	4	4.0
T6	Easy to install	0.5	0	0.0
T7	Easy to use	0.5	5	2.5
T8	Portable	2.0	4	8.0
T9	Easy to change	1.0	3	3.0
T10	Concurrent	1.0	4	4.0
T11	Includes special security objectives	1.0	1	1.0
T12	Provides direct access for third parties	1.0	0	0.0

T13	Special user training facilities are required	1.0	1	1.0
Total Technical Factor (TFactor)				**40.5**

Technical Complexity Factor(TCF) $= 0.6 + (0.01 \times \text{TFactor})$
$$= 0.6 + (0.01 \times 40.5)$$
$$= 1.005$$

Environmental Complexity

Factor	Description	Weight (W)	Rated Value (0 to 5) (RV)	Impact (I = W × RV)
F1	Familiar with the project model that is used	1.5	4	6.0
F2	Application experience	0.5	3	1.5
F3	Object-oriented experience	1.0	4	4.0
F4	Lead analyst capability	0.5	3	1.5
F5	Motivation	1.0	3	3.0
F6	Stable requirements	2.0	5	10.0
F7	Part-time staff	-1.0	0	0.0
F9	Difficult programming language	-1.0	3	-3.0
Total Environment Factor (EFactor)				**23.0**

Environmental Factor (EF) $= 1.4 + (-0.03 \times \text{EFactor})$
$$= 1.4 + (-0.03 \times 23.0)$$
$$= 0.71$$

Factor	Description	Weight (W)
UUCP	Unadjusted use case point	67
TCF	Technical Complexity Factor	1.005
EF	Environmental factor	0.71

3. Use Case Point (UCP)

$\textbf{UCP} = \text{UUCP} \times \text{TCF} \times \text{EF}$
$\textbf{UCP} = 47.80785$

$\textbf{Total Working Hours} = \text{UCP X Working Hours/UCP}$
$\textbf{Working Hours/UCP} = 16 \text{ Hours}$
$\textbf{Total Working Hours} = 47.80785 \text{ X } 16$
$\textbf{Total Working Hours} = 764.9265 \text{ Hours}$