



Software Engineering IT314
Project: Student leave and TA assistantship
management
Group: 9

● **Group Members:**

- Preksha Anand - 202001061
- Maharth Thakar - 202001069
- **Meet Patel - 202001074**
- Kartik Dangi - 202001079
- Harsh Kathiriya - 202001088
- Kuldipsinh Gohil - 202001092
- Neha Miglani - 202001097
- Harsh Anand - 202001101
- Darshan Kheni - 202001109

Lab : 04

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1. Tools, Technologies and Frameworks used in the Project

- **Frontend**

1. React.js

- React is the most preferred framework for the development of small projects and also easy to use.
- It helps us to make the project in less time w.r.t. The other tech stacks like HTML and Javascript.

2. CSS

- CSS is used for styling the file developed by React. It helps us to make it user friendly to access the web application.

3. Bootstrap

- Bootstrap is used as a framework for the css which helps us create the website more comfortably with less code. It helps us in creating the website with effectiveness and responsively.

- **Backend**

1. Django

2. MongoDB

(b) For your project, you have to use the NoSQL databases of your choice strictly, and you can also explore and use ElasticSearch (DB) Database for the same.

2. We are using MongoDB as the NoSql Database

3. Estimating with Use Case Points:

Unadjusted Use Case Weight (UUCW):

Use Case Complexity	Weight	Number of Use Cases	Product
Simple	5	5	25
Average	10	3	30
Complex	15	2	30

UUCW = (Total No. of Simple Use Cases x 5) + (Total No. Average Use Cases x 10) + (Total No. Complex Use Cases x 15)

UUCW = (5 x 5) + (3 x 10) + (2 x 15)

= (25 + 30 + 30)

= **85**

Unadjusted Actor Weight (UAW)

Actor Complexity	Actor Weight	Number of Actors	Product
Simple	1	0	1×0
Average	2	1	2×1
Complex	3	4	3×4

We have 4 complex actors (HOD, student, TA, Faculty) and an average actor (main system).

So we have,

$$\text{UAW} = (\text{Total No. of Simple actors} \times 1) + (\text{Total No. Average actors} \times 2) \\ + (\text{Total No. Complex actors} \times 3)$$

$$\text{UAW} = (0 \times 1) + (1 \times 2) + (4 \times 3) \\ = \mathbf{14}$$

❖ 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	Distributed System	2.0	0	0.0
T2	Response time or throughput performance objectives	1.0	2	2.0
T3	End user efficiency	1.0	2	2.0
T4	Complex internal processing	1.0	2	2.0
T5	Code must be reusable	1.0	1	1.0
T6	Easy to install	0.5	2	1.0
T7	Easy to use	0.5	2	1.0
T8	Portable	0.5	2	1.0
T9	Easy to change	1.0	2	2.0
T10	Concurrent	1.0	2	2
T11	Includes special security objectives	1.0	0	1
T12	Provides direct access for third parties	1.0	1	1

T13	Special user training facilities are required	1.0	2	2
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Total Technical Factor (TF) = Sum of Impact of all the Factors
= 18

TCF (Technical Complexity Factor) = $0.6 + (0.01 \times TF)$
 $= 0.6 + (0.01 \times 18)$
 $= 0.60 + 0.18$
 $= 0.78$

❖ 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	3	3
E4	Lead analyst capability	0.5	4	2

E5	Motivation	1	5	5
E6	Stable requirements	2	4	8
E7	Part-time staff	-1	0	0
E8	Difficult programming language	-1	2	-2

Total EFactor (EF) = Sum of impact of all the factors

= 21.5

ECF (Environmental Complexity Factor) = $1.4 + (-0.03 \times EF)$

= $1.4 + (-0.03 \times 21.5)$

= $1.4 - 0.645$

ECF = 0.755

❖ **UCP (Use Case Points) :**

UCP are the adjusted use case points.

UCP = $(UUCW + UAW) \times TCF \times ECF$

UCP = $(85 + 14) \times 0.78 \times 0.755$

UCP = 58.3011

- **Approximately considering 4 man hours per use case point will be used**

➤ **Estimated Effort = $UCP \times \text{Hours/UCP}$**
= 58.3011×4
= 233 hours

References:

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