Evan Louie
72210099                     EECE443: Assignment 3

## Definitions/Additional Parameters:

**Cost/Person:** $5,500/month

**UUCW** – Unadjusted Use Case Weight: number of points, which account for the number and complexity of use cases.

**UAW** – Unadjusted Actor Weight: number of points, which account for the number and complexity of actors (users).

**TCF** – Technical Complexity Factor: multiplication factor, which accounts for the issues stemmed from technical considerations.

**ECF** – Environmental Complexity Factor: multiplication factor, which accounts for the issues stemmed from environmental considerations.

**UCP** – Use Case Points

**UCP = (UUCW + UAW) x TCF x ECF**

## Unadjusted Use Case Weight

**Note**: Using the use case survey from appendix A, we will map L, M, and H complexity use cases to Simple, Average, and Complex use case point classifications prospectively.

> **UUCW** = (Total No. Simple Use Cases x 5) + (Total No. Average Use Case x 10) + (Total No. Complex Use Cases x 15)
>> = (9 x 5) + (6 x 10) + (2 x 15)
>> = 45 + 60 + 30
>
> **UUCW = 135**

## Unadjusted Actor Weight

**Assumption:** database is hosted on the same network as application/modeling layer and is not considered an API call over network/protocol and therefore is considered *simple*.

| Simple | Average | Complex |
|--------|---------|---------|

| System | | Partner<br>Treasurer<br>Trader<br>Admin |
|---|---|---|

**NOTE:** We do not use the 'all' actor shown in Appendix. A due to it's being an abstract actor, which is utilized by all other actors.

> **UAW** = (Total No. Simple Actors x 1) + (Total No. Average Actors x 2) + (Total No. Complex Actors x 3)
> = (1 x 1) + (0 x 2) + (4 x 3)
> = 1 + 0 + 12
> **UAW = 13**

## Technical Complexity Factor

**Assumptions:**
- Project database is hosted using an in-memory database (i.e. SAP HANA), therefor negating the need for distributed system and allowing the Application Layer to be hosted within the same application server.
- The platform is only available as a cloud solution; therefore there is no need for installation to on premise systems
- The only way to consume the application is a front end website and the website is designed using HTML5/CSS3 with responsive design to allow usage on all devices with an Internet browser.

| Factor | Description | Weight | Assigned Value | Weight x Assigned Value |
|---|---|---|---|---|
| T1 | Distributed system | 2.0 | 0 | 0 |
| T2 | Response time/performance objectives | 1.0 | 2 | 2 |
| T3 | End-user efficiency | 1.0 | 3 | 3 |
| T4 | Internal processing complexity | 1.0 | 5 | 5 |
| T5 | Code reusability | 1.0 | 2 | 2 |
| T6 | Easy to install | 0.5 | 0 | 0 |
| T7 | Easy to use | 0.5 | 3 | 1.5 |
| T8 | Portability to other platforms | 2.0 | 0 | 0 |
| T9 | System maintenance | 1.0 | 3 | 3 |
| T10 | Concurrent/parallel processing | 1.0 | 4 | 4 |

| T11 | Security features | 1.0 | 5 | 5 |
| T12 | Access for third parties | 1.0 | 2 | 2 |
| T13 | End user training | 1.0 | 4 | 4 |
| | | | **Total (TF):** | **31.5** |

TCF = 0.6 + (TF/100)

TCF = 0.6 + (31.5/100)

**TCF = 0.915**

## Environmental Complexity Factor

**Assumptions:**
- The development team has been working together for quite a while as they took on quite a few startup projects before graduating.
- The team has a good grasp on how the system should behave in terms of simple stock/bonds transactions, however the team is still somewhat unsure on how to implement any sort of predictive analytics or BI.
- As all the members are only working part time, motivation and communication will be a major issue.
- Development team is using a language/framework that they have all used together before.

| Factor | Description | Weight | Assigned Value | Weight x Assigned Value |
|--------|-------------|--------|----------------|-------------------------|
| E1 | Familiarity with development process used | 1.5 | 4 | 6 |
| E2 | Application experience | 0.5 | 3 | 1.5 |
| E3 | Object-oriented experience of team | 1.0 | 5 | 5 |
| E4 | Lead analyst capability | 0.5 | 2 | 1 |
| E5 | Motivation of the team | 1.0 | 2 | 2 |
| E6 | Stability of requirements | 2.0 | 4 | 8 |
| E7 | Part-time staff | -1.0 | 5 | -5 |
| E8 | Difficult programming language | -1.0 | 1 | -1 |
| | | | **Total (EF):** | **17.5** |

ECF = 1.4 + (-0.03 x EF)

ECF = 1.4 + (-0.03 * 17.5)

**ECF = 0.875**

## Use Case Points

UCP = (UUCW + UAW) x TCF x ECF

UCP = (135 + 13) x 0.915 x 0.875

**UCP = 118.4925**

## Estimated Effort

**Assumption:**
- Although the team has been working together for quite a while, this is the first time the project manager has ever done this type of analysis. Because of this, a Productivity Factor of 24 will be used. (Higher than the recommended 20)

Estimated Effort = UCP x Hours/UCP

Estimated Effort = 118.4925 x 24

**Estimated Effort = 2843.82 Person Hours**

## Estimated Time

**Assumption:**
- On average, a month has 160 'work' hours. We will classify a part timer as someone who works <=**100 hours/week.**

Estimated Time = Estimated Effort / (part-time Hours/Week)

Estimated Time = (2843.82 Hours) / (100 Hours/Month)

**Estimated Time = 28.4382 person-months**

## Estimated Cost

**Assumption:**

- The $5,500/person-month is **already** taking into account that each person is only working part time.

  Estimated Cost = Estimated Time x (Cost/Person-Month)

  Estimated Cost = 28.4382 x $5,500/Person-Month

  **Estimated Cost = $156410.10**

## Conclusion

This project will take an estimated **28.4382 person-months** to complete. That means, with our **team of 5**, it should take approximately **5.69 months to complete** and cost an estimated **$156,410.10.**