IT314 - Software Engineering
Lab-4

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Tools technologies and framework

MongoDB

MongoDB is a **non-relational database**. As it is a document database, it stores data in JSON-like documents and these documents also support arrays and nested objects.
When the data cannot be represented in the form of tables or when different instances of objects have different fields the schema is not fixed then using SQL would result in the creation of a large number of tables making accessing the data a slow process. Other than this MongoDB also supports scale out making it easier for applications to run well when large numbers of users are accessing it at once, this can be the case for our public news aggregator website as it is not a private application anyone can use it from anywhere.

Express

Express is a server side framework used to build single page, multipage, hybrid mobile, web, applications. Some of the key features that could be used in our project.

It allows for users to define routes for the application based on URLs and HTTP methods like sending a get request may lead to a different result than sending a put request to the same URL.
It also includes various types of middleware modules that allows to perform additional tasks on request and response including the error handling middleware.
Allows to create a REST API server.
It is easy to connect with many well known databases like Postgres and MongoDB.

React.JS

Most popular front-end Javascript library that allows us to divide the frontend in components increasing the reusability of code as these components only need to be made once and then can be imported in multiple projects. Making changes to the code also becomes easier as there is only one point where the change needs to happen instead of changing everywhere that frontend is used. It is very similar to Javascript so one can easily use it if he/she is already familiar with Javascript.

Node.js

A server side programming framework built on top of Chrome's Javascript engine which provides event driven and non-blocking IO which eliminates the waiting time and continues with the next request to be made,

b) Database Used: Our group will be using MongoDB which is the world's most popular NoSQL database.

Use Case Size Point Estimation

Unadjusted Use Case Points

Use Case Classification	Number of Use Case	Weight Assigned
Simple	**19**	**5**
Average	**0**	**10**
Complex	**0**	**15**

UUCW = 19 * 5 + 0*10 + 0*10

UUCW = 95

Unadjusted Actor Points

Actors	Complexity
Users	Complex
System	Average

Actor Classification	Number of Use Case	Weight Assigned
Simple	**0**	**1**
Average	**1**	**2**
Complex	**1**	**3**

$$UAW = 1*2 + 1*3$$

$$\boxed{UAW = 5}$$

Technical Factor

Factor	Description	Weight (W)	Rated Value (0 to 5) (RV)	Impact (I = W × RV)
T1	Distributed System	2.0	5	10
T2	Response time or throughput performance objectives	1.0	0	0
T3	End user efficiency	1.0	5	5
T4	Complex internal processing	1.0	0	0
T5	Code must be reusable	1.0	3	3
T6	Easy to install	.5	0	0

T7	Easy to use	.5	5	2.5
T8	Portable	2.0	0	0
T9	Easy to change	1.0	2	2
T10	Concurrent	1.0	3	3
T11	Includes special security objectives	1.0	0	0
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)				**25.5**

TCF = 0.6 +(TF)/100

For News Aggregator system, TCF = 0.6 + (25.5/100) = 0.855

TCF = 0.855

Environmental Factor

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	0	**0**
F2	Application experience	.5	0	**0**
F3	Object-oriented experience	1.0	2	**2**
F4	Lead analyst capability	.5	0	**0**
F5	Motivation	1.0	2	**2**
F6	Stable requirements	2.0	1	**2**
F7	Part-time staff	-1.0	1	**-1**
F8	Difficult programming language	-1.0	0	**0**
Total Environment Factor (EFactor)				**5**

ECF = 1.4 + (-0.03 * EF)

For News Aggregator system, ECF = 1.4 + (-0.03*5) = 1.25

ECF = 1.25

Calculating Adjusted Use Case Points (UCP)

- UUCP = UUCW + UAW
- UUCP = 95 + 5
- **UUCP = 100**

- UCP = UUCP * TCF * EF
- **UCP = 100 * 0.855 * 1.25**

UCP = 106.875

Considering 3 man hours per use case point

Estimated Efforts = UCP x Hours/UCP
Estimated Efforts = 106.875 x 3

Estimated Efforts = 320.625 Hours

Approximating it to 320 hours

Considering 40 man hours work can be performed in 1 week

Estimated Efforts = 8 Weeks