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**Group 30**

**FDM Mentor Matching App**

**ECS506U Software Engineering  
Group Project**

**Problem/Domain Analysis Report**

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# **1.Introduction**

The FDM Mentor Matching app automatically matches FDM employees looking for mentoring to FDM alumni and employees looking to mentor someone. Additionally, the app will offer a reverse mentoring program which is currently being trialled at FDM. This report summarises the problem and provides a detailed explanation of the solution our team came up with. We will go into detail to explain the key users considered, their roles and the significance of each task and procedure in meeting the criteria. We will also discuss why we chose this specific environment and why we think this is beneficial to our clients. By analysing the domain of mentor matching applications and identifying stakeholders, we are able to develop an app which satisfies all stakeholders and improves upon existing apps of competitors.

## **Problem Definition**

FDM currently hires more than 2000 graduates every year and has over 5000 global employees. Currently the mentor matching process is done by the Learning and Development team. 76% of people think having a mentor is important, yet only 37% of professionals have one [1]. This means that there is a considerable amount of people who want a mentor but do not have one. This could be due to the difficulty of finding a mentor since only 14% of mentor relationships started by outright asking someone to be their mentor [1]. This means that in order to find a mentor one would have to put in a lot of effort which could put people off from reaping the benefits of such a relationship. Employees that have received mentoring are promoted 5 times more often than employees without mentors. Mentors are also benefiting from this relationship since they are 6 times more likely to be promoted than non-mentors [2]. The app would facilitate finding a suitable mentor/ mentee so that more people can experience these benefits.

## **Motivation**

FDM employees would want to use this app over other mentor matching applications since it connects them with mentors who are currently or have previously worked at FDM, meaning their mentors know the company culture, hierarchy and, in the case of current employees, can stick up for their mentees within the company.

## **Solution**

This app would not only benefit people who are looking for a mentorship relationship but also the Learning and Development team - since they are now able to focus on other tasks. Finding a mentor takes a lot of time, from finding a suitable mentor, to messaging people, being ignored and then finally finding a person willing to be a mentor. The matching algorithm, therefore, saves individual users and the Learning and Development team time, which can be spent doing other productive tasks - in turn saving FDM money.

The software would allow people that are looking for mentors/mentees to create a profile stating their interests, fields and goals for the mentorship. The app's matching algorithm would then find

a suitable match instantly, rather than having to search for a suitable mentor manually. After being matched mentors and mentees can message each other via a communication panel. The matching algorithm saves users time while the messaging and profile features make sure that every user is satisfied in their mentoring pair.

## 2. Customers and Users

### **Learning and Development Team:**

The software will be supervised and administered by FDMs Learning and Development team; FDMs large mentoring programme is overseen in this particular department. As new people join this mentorship programme, the software aims to quickly and efficiently match mentors and mentees based on the profiles created by new individuals so that the Learning and Development Team can re-allocate their time towards other tasks and programmes.

The team would be taking on a few different responsibilities, but if we generalise them the key groups that we can focus on are:

**Admin/Mod:** Administrators and Moderators would be responsible for ensuring that users are satisfied with the outcome of the application.

Responsibilities include:

- Handling complaints or concerns raised about the application and taking the necessary action (e.g. letting IT technicians know of technical problems)
- Communicating and working closely with the IT technicians to let them know of any fixes or changes necessary
- Helping users set up the application (similar to a customer service platform where they are the first people to contact when dealing with issues)

Key Traits include:

- Good grasp of administrative tools available to them
- Problem solvers and critical thinkers to aid in resolving disputes or suggesting improvements for the application
- Good understanding of how FDM operates
- Some experience working with the Learning and Development Team at FDM

**IT Technicians:** IT technicians would be responsible for ensuring that the software runs smoothly and efficiently.

Responsibilities include:

- Communicating and working closely with administrators and moderators to help them in resolving technical difficulties that users raise concerns about

- Working on fixes and changes that the administrative team ask for or suggest
- Ensuring the application runs smoothly and efficiently whilst also producing the best results
- Ensuring all functions of the application work as expected even after long durations of time (e.g. matching is accurate, inactive accounts are not considered and data considered to match is up to date)

Key Traits include:

- Good understanding of computers and how they work
- Understands how to diagnose problems on the application quickly and efficiently
- Critical thinker and able to suggest updates or improvements based on diagnosis
- Good communicator when it comes to discussing possible changes to the application
- Well versed with new updates to technologies and environments and able to update application to meet the same criteria for easier usage

## **Users/Individuals:**

**Mentors:** (Alumni, Consultants and Staff)

Roles include:

- Creating an account on the application. This includes a simple registration process that verifies users by letting them choose which of the three categories they fall under (with proof).
- Setting up their profile on the application, using data such as free time in schedule, experiences (includes: departments worked in, previous jobs or opportunities) and interests, (includes: research or dissertations, hobbies, larger projects)
- Waiting for matches to be made (the more data provided above, the better the results)
- Approving of potential candidates
- Contacting mentee when chosen as a mentor (this will be possible via the communication panel)

Key Traits include:

- The FDM website shows that there are mentoring opportunities for the following groups of people: **(Alumni, Consultants and Staff)**
- Familiar with FDM and know how they operate

**Mentees:** (Graduates, Returners to Work, Ex-Forces)

Roles include:

- Creating an account on the application. This includes a simple registration process that verifies users by letting them choose which of the three categories they fall under (with proof).

- Setting up their profile on the application, using data such as free time in schedule, experiences (includes: departments worked in, previous jobs or opportunities) and interests, (includes: research or dissertations, hobbies, larger projects)
- Verifying and choosing which of the three categories they fall under (with proof)
- Waiting for matches to be made (the more data provided above, the better the results)
- Contacting and choosing mentor based on matches (this will be possible via the communication panel)

Key Traits include:

- The FDM website shows that they aim to provide mentorship programmes to three particular groups: (**Graduates, Returners to Work and Ex-Forces**)
- Keen to work with FDM
- Interested in telecommunications, media and technology markets

Both individual user types include the role and responsibility to contact their match in order to make the decision. Whilst some may argue this role is unnecessary in the process of matching the mentor and mentee, this step is just as crucial within this process of matching mentors and mentees as it is after the match is made. Whilst the programme aims to make the optimal match for each mentor or mentee, there is still a scope for human error. If, for example, the mentor or mentee miss-clicked and set up the wrong schedule, after communicating they may realise that their schedules clash and they cannot work together. They would be able to edit their profile and fix this mistake - allowing mentors and mentees to go back to looking for a new match. Other examples of potential human errors include: miss-clicking and choosing a mentor or mentee before contacting them, entering the wrong data or having typos in data (potentially disrupting the software and making it harder to find a match), etc.

The main difference is that the mentee gets the choice of mentors that they have been matched with and contacts them to help them make a better decision. The idea is that the software uses an objective algorithm to make matches and present them to each individual. This removes potential bias and letting them choose from the matches, allows them to provide their own input in the process. To make this fair and allow for both the mentor and mentees to have some choice, mentors are given the option to approve of potential candidates before mentees get the option to choose them. Approved candidates would then be shown these mentors as potential choices – thus taking both individuals' input into consideration.

## Other Users:

There may be rare cases where people other than mentors, mentees or the learning and development team may visit this application. Since the app has a login and registration feature in order to make use of profiles, there will still be a limited amount of information that can be accessed without an account. As a result, guest users or other officials and clients may visit the software and browse through the application. They will see an option to register and login, however, verifying and joining the programme requires being a part of the key categories that were listed above, so they would not gain access to the entire software.

**Guest Users** (people browsing the app but unable to login):

Roles include:

- Browsing through the limited pages available
- Putting in a register request (most likely will fail due to lack of verification)
- Contacting FDM if there interest is piqued (through contact numbers provided on other pages or FDM official website)

Key Traits include:

- A third party not necessarily involved in the mentorship programme
- Someone who came across the website whilst browsing through opportunities or reading about FDM specifically
- Potentially interested in FDM
- Potentially interested in the application (perhaps because they wish to make their own)

**Supervisors** (people assessing the strength of the application or the company):

Roles include:

- Browsing through the limited pages available
- Putting in a register request (most likely will fail due to lack of verification)
- Contacting FDM if there interest is piqued (through contact numbers provided on other pages or FDM official website)

Key Traits include:

- A third party not necessarily involved in the mentorship programme
- Affiliated with FDM in some way
- Clients, Former Employees, Future Partners, Competitors or any professional with some interest in FDM
- Someone interested in the format of the application (perhaps because they wish to make their own)

### 3.The Environment

The application will be developed as a web application. Many existing mentor matching applications, such as Mentorloop, MentorCloud, and MentorNet are also web based, so we saw no need to deviate from this trend. Our reasoning for choosing to develop the application as a web application is because the goal of the application is to match mentors with mentees, as such, having a wide pool of users is valuable. Therefore, having it be a web application is the best choice out of all platforms, as all that is required for a user to use the application is an internet connection. As FDM hires upwards of 5000+ employees, ensuring that all can have ease of access to the application, regardless of their device and its operating system is integral. We chose to avoid developing it as a desktop application as installation of the application can cause a reduction of the pool of potential users due to the need for developing the applications

cross platform capabilities. With a web application, the platform isn't important so long as the internet is used. In addition, application is more short term in its usage, so having a user download an entire application for a short term use is impractical from the users point of view, as well as the companies point of view, due to the need to create updated versions of the application for each update of the operating system, which will cause more spending on the application.

We chose a somewhat middle ground approach when it comes to mobile applications, choosing to extend the development of the application as a webview app for mobile. The reasoning behind this is due to the mentees being younger (as FDM hires upwards of 2000+ graduates every year), and therefore more likely to use a phone, creating a mobile-based webview app would allow them to get on the application with ease, expanding the pool of users. Extending it into a webview app would not cause the same problems as developing it as a mobile app from scratch. We did however choose to not develop it as a full mobile app as it would suffer from the same problems that a desktop application would have, like installation and updated versions.

The application will be developed using Javascript React framework and CSS Bootstrap framework to handle the front end. We'll use React as it is the most popular front end Javascript framework [3], is compatible with all modern browsers [4], and allows us to use react native to develop the mobile webview app for both IOS and Android with a single code base [5]. We'll combine this with the CSS Bootstrap framework so that the application can become responsive to mobile web layout[6]. We will use PHP to develop the back end, as it remains the most used server side scripting language on the internet [7]. As the application is reliant on user information, we will be using a mySQL database to store user information, this is because MySQL is better suited for ensuring data integrity and structure than a noSQL database, thus preserving the data and keeping it unchanged, which is integral for the matching algorithm, which is the core of the application, it also has better security than noSQL databases, due to keeping of ACID properties [8].

## 4.Tasks and Procedures Currently Performed

The FDM Mentor Matching App will mainly be used by mentors and mentees only as it will connect them using a designated algorithm and create a platform for them to communicate. Other users such as Admins will only be using the app when needed. Each type of user will have different features available to them in the app for users to do their specific role efficiently.

### Mentees & Mentors

**Create user profiles:** Allows users to sign up for the app and create personal profiles. Profiles should include information such as: skills, qualifications, experience, interests, and career goals. This information can currently be collected via surveys and interviews and will be used to manually match similar mentors and mentees.

**Finding a Mentor:** This step involves manually matching mentors with mentees based on their interests, goals, and experience. This can be a time-consuming process, but it is important to match the mentees with mentors who can provide the best support and guidance. Our app will



have a designated algorithm for this process to drastically reduce the time taken to match mentee and mentor whilst doing it correctly and finding a perfect match.

**Communication:** To ensure that the mentoring relationship is effective, a communication plan needs to be established. Mentors and mentees between them organise meetings using their preferred choice of communication. These can include in-person meetings, phone or video calls, or email communication. Our App will have its own messaging platform instead of a 3<sup>rd</sup> party app so that it can be monitored and used to solve any disputes or issues if any arise.

**Feedback and ratings:** Currently to improve the mentor matching program, gathering feedback from both mentors and mentees is crucial. This can be done through regular check-ups, surveys, or interviews. The feedback can be used to make improvements to the program and ensure that both mentors and mentees are receiving the support they need. The app will make this process significantly easier as it will be an easily accessible section for both mentors and mentees to provide their feedback.

## **Mentees**

**Approving Mentor:** Before the mentoring relationship begins, it is important for the mentee to review the mentor's profile and confirm that they approve of the match. This can be done through a meeting or conversation between the mentee and potential mentor, or through a review of the mentor's qualifications, background, and experience. The goal of this task is to ensure that the mentee is comfortable with the mentor and feels confident in the match.

## **Admin**

**Dispute Resolution:** Based on the Feedback, Admins monitor the relationship between matched mentors and mentees and have the task to solve and find a solution to any disputes or conflicts that may arise. This would be done via a ticket system with the end result being making sure both mentor and mentee are satisfied with their match and the program itself. If not, there will be an option to match with another mentor/mentee. However, if an admin feels like either user acted inappropriately (i.e using abusive language) the admin will have the power to remove the user from the program.

**Progress Tracking:** Currently regular check-ins can be used to track progression and check whether goals are being met in the mentoring relationship. Progress tracking can help to identify any areas of improvement or potential challenges in the mentoring relationship and can be used to adjust or provide additional support as needed. By tracking progress, the mentor matching program can ensure that both mentors and mentees are making progress towards their goals and that the mentoring relationship is working effectively. Our app will store progression tracking so that admins can see how well the mentorship is working and how close the mentee is to reaching goals by using the program.

## 5.Competing Software

### MentorCloud [9]

This platform connects individuals with mentors and mentees based on their interests and career goals. It allows users to create a profile, search for potential mentors or mentees, and message each other to set up meetings.

#### Pros:

- Wide variety of mentors to choose from: With MentorCloud, users have access to a diverse pool of mentors with different backgrounds and experience levels. This increases the chances of finding a mentor who is a good fit for the mentee's interests and career goals.
- Ability to search by specific industries or job titles: MentorCloud allows users to filter their search for mentors by specific industries or job titles. This makes it easy for mentees to find mentors who have experience in the field they're interested in.

#### Cons:

- Lack of a matching algorithm: MentorCloud does not have a built-in matching algorithm to match mentees with mentors. This means that mentees have to manually search through the pool of mentors to find someone who aligns with their interests and goals.
- Less user-friendly interface: Some users have reported that the interface of MentorCloud can be confusing and difficult to navigate, which can make it less user-friendly.

### Mentorloop [10]

This software allows companies to set up internal mentoring programs for their employees. It includes features such as matching algorithms, mentoring goals, and progress tracking.

#### Pros:

- Ability to track progress and set specific mentoring goals: Mentorloop includes features such as progress tracking and the ability to set specific mentoring goals. This allows both mentees and mentors to track their progress and measure the success of the mentoring relationship.
- Designed for internal company use: Mentorloop is designed to be used by companies to set up internal mentoring programs for their employees. This makes it an ideal choice for organisations looking to implement a mentoring program within their own company.

#### Cons:

- May not be suitable for external mentoring: Since Mentorloop is designed for internal company use, it may not be the best option for organisations looking to connect employees with mentors outside of their company.

- Cost of the software may be high: Mentorloop requires a subscription fee to use the software. Some companies may find the cost to be too high, especially if they have a small number of employees.

## **MentorNet [11]**

This software connects students and professionals in STEM fields with mentors in their field of study. It includes a matching algorithm, progress tracking, and the ability to message mentors.

### **Pros:**

- Focus on STEM mentoring: MentorNet specifically focuses on connecting students and professionals in STEM fields with mentors in their field of study, making it ideal for those in STEM-related careers.
- As a platform dedicated to STEM fields, MentorNet has a wide pool of mentors from different STEM-related industries, providing a variety of experiences and perspectives.

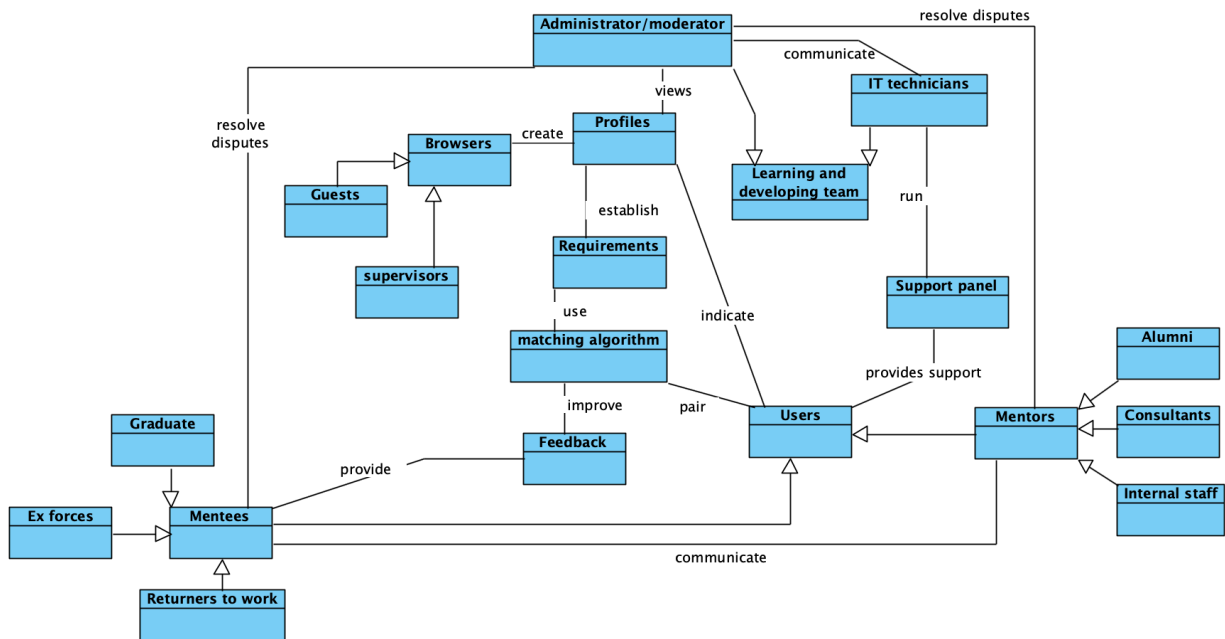
### **Cons:**

- While this is a pro for those in STEM fields, it may not be suitable for those outside of STEM careers.
- The platform may have limited customization options, and the matching algorithm may not take into account specific preferences or requirements.

In conclusion, MentorCloud, Mentorloop, and MentorNet are three mentoring platforms that match mentees and mentors according to their interests and career objectives. MentorCloud lacks a matching algorithm, despite its extensive selection of mentors. Although Mentorloop has features like progress tracking and specific mentoring goals that are intended for use within the company, it may not be suitable for external mentoring and may cost a lot. MentorNet focuses on connecting STEM professionals and students, but it may not be appropriate for non-STEM professionals.

A matching algorithm could be added to our own mentoring platform to assist in matching mentees with mentors who share their interests and objectives. A mobile application could also be included so that users could access the platform while on the go. In addition, I would include career development features like resume building, tools for job searching, and career resources. Last but not least, We could provide a community platform for mentors and mentees to connect and exchange information.

## 6.Domain Model



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