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1. Introduction

1.1 Overview of the Project

The online dashboard for the Mentorship Network is a tool that automates and simplifies many of the functions that are currently done manually by the board of the Mentorship Network.

1.2 Objectives of the Project

The objectives of this project are to:

- Develop a central database of Mentors and Mentees
- Make sure that information is properly stored and secured
- Simplify the process of sending mass emails to subgroups of the program
- Simplify the process of finding information about a specific member of the program

- Automate the process of matching Mentors and Mentees
- Provide statistical information about the members of the program in many forms (including graphs, tabular form).

1.3 The Need for the Project

The board of the Mentorship Network spends immense amounts of time doing manual tasks that can easily be automated. This project would bring about that automation, which would allow the board of the Mentorship Board to focus their efforts in other areas that need their attention.

1.4 Overview of Existing Systems and Technologies

Main Technologies associated with the software:

- Web programming technologies (JS,React,HTML,CSS, Python, Flask)
- Firebase(Database)
- Diagram and design tools (StarUML, Google Docs)

1.5 Scope of the Project

Main actors of this system:

- Board Members
- Admins

Main use cases associated:

1. Boards Members can:
    - Add new Mentors
    - Add new Mentees
    - Look up Mentors and Mentees
    - Generate matches of Mentors and Mentees
    - Send emails to Mentors and/or Mentors
    - View statistics about Mentors and Mentees
2. Admins can:
    - Add new Board Members
    - Remove Board Members

1.6 Deliverables

A web-based software system. This contains a central database and functionalities for various stakeholders. Since a number of stakeholders are involved, different GUIs will be provided to different users.

2. Feasibility Study

2.1 Financial Feasibility

Being a web application the project could have an associated hosting cost. However, we will be using a free hosting service. Since the system doesn't consist of any multimedia data transfer, the bandwidth required for the operation of this application is very low.

The system will follow the freeware software standards. No cost will be charged from the potential customers. Bug fixes and maintaining tasks not will have an associated cost either.

The potential market is the Mentorship Network at NYUAD and any other Mentorship-oriented organization at any other university or company.

Besides the associated cost, there will be many benefits for the Mentorship Network. Especially the extra effort that is associated with handling excel sheets in Google Drive, matching pairs manually, reporting statistics about the members and using software like mail merge.

From these, it's clear that the project is financially feasible.

2.2 Technical Feasibility

The Project is a complete web-based application. The main technologies and tools that are associated with the project are:

- HTML
- CSS
- JS
- React
- Python
- Firebase
- Flask

Each of the technologies is freely available and the technical skills required are manageable. The time limitations of product development and the ease of implementing using these technologies are synchronized.

The web site will be hosted in a free web hosting space. The bandwidth required in this application is very low, since it doesn't incorporate any multimedia aspect.

From these, it's clear that the project OES is technically feasible.

2.3 Resource and Time Feasibility

Resource feasibility

Resources that are required for the project includes:

- Programming device (Laptop)
- Hosting space (freely available)
- Programming tools (freely available)
- Programming individuals (Gabriel Garcia, Daniel Watson, Jaisal Friedman)

So it's clear that the project has the required resource feasibility.

2.4 Risk Feasibility

Risk feasibility can be discussed under several contexts.

Risk associated with size:

Estimated size of the product in line of codes:

Being a web application with many stakeholders, the project will contain a significant amount of code lines (~9K) . As the system doesn’t contain any multimedia aspect, the file sizes and the complete project size will not exceed 200MB.

Estimated size of product in number of programs:

Though the application supports many stakeholders, it will be constructed as a single web application with a single login page rather than having many sites for different users. Depending on the access rights, the contents will be shown or hidden.

Size of the database created or used by the product:

Database size will not exceed the values supported by Firebase. The number of relations and entities is minimized by using the best practices of normalization theories.

Users of the product:

- Board Members
- Admins

Number of projected changes to the requirements for the product? Before delivery? After delivery:

The requirements are clearly identified before the implementation phase. Being a specific product, the requirements will be changed only if new functionalities are added to the system.

Amount of reused software:

Though the main logics are implemented throughout the project, the project will use some JS and Python libraries to incorporate additional functionalities.

Business impact risks:

Effect of this product on company revenue:

The Mentorship Network is a non-profit student organization at NYUAD, therefore, even though the project will increase their productivity, it will have no revenue to affect.

Reasonableness of delivery deadlines:

Being a 5 weeks project, the project will have several deadlines and deliverables that are scheduled successively. Depending on the coding and designing cost and effort, the deadlines are quite reasonable.

Number of customers who will use this product and the consistency of their needs relative to the product:

As mentioned above, we can categorize stakeholders into 2 main categories. This system can support many users simultaneously due to the low bandwidth requirements.

Number of other products/systems with which this product must be interoperable:

Not applicable at this stage. The project could use APIs of larger services to provide more automation to the team and act as a homepage for the board of the Mentorship Network.

Sophistication of end users:

The project is designed while maintaining the complexity at a very low level. Usability is highly improved by providing help documents and making GUIs easy to use.

Amount and quality of product documentation that must be produced and delivered to the customer:

Customers will be provided with a complete online user manual. As the software is implemented as a freeware and open-source system, the code will be available for free.

Costs associated with delivery:

There are no costs associated with delivery.

Customer-related risks:

The project is a specific type of product designed for NYUAD. Before implementing the system in any other educational institute, there will be some basic modifications required.

Development environment risks:

Is a software project management tool available?

Github will be used as the main project management tool.

Are tools for analysis and design available?

The Project will require several designing software

StarUML (class diagram)
StarUML (activity diagram)

Are compilers or code generators available and appropriate for the product to be built?

JS and Python will be used as the main scripting languages. All the libraries and interpreters will be freely available.

Are software configuration management tools available?

Configuration management will be done using GIT that is freely available.

Does the environment make use of a database or repository?

This is a database-oriented system that will use Firebase (non-SQL DB)

Are all the software tools integrated with one another?

The main deliverables will be packaged under a single project. All the stakeholders will have a single login page.

Process issue risks

The project will follow the Agile software development process. This provides the flexibility to accommodate the rollout of new features for the project.

Technical issue risks

Are specific conventions for code documentation defined and used?

Software code will be freely available and the code documentation will be provided.

Are configuration management software tools used to control and track change activity throughout the software process?

GIT will be used throughout the software implementation process.

Technology risks

Is the technology to be built new?

All the technologies are very well established and old enough (but not obsolete).

Do the system requirements demand the creation of new algorithms, input or output technology?

The project will have several algorithms to generate statistical distributions and generate matches of Mentors and Mentees.

2.5 Social/Legal Feasibility

The project uses freely available development tools, and provide the system as an open-source system.

JS and Python libraries that are used in this system are free open-source libraries.

Since this new system automates many mundane tasks that take large amounts of time for the board of the Mentorship Network, it will have a large impact.

3. Considerations

Performance:

The project requires very low bandwidth, hence the performance will not degrade with an increasing number of potential users. A free hosting service will be used.

Firebase will provide adequate speed for database transactions. Since no big data analysis is done, Firebase is the ideal database for this project.

Response time: less than 2 seconds
Processing time: Less than 2 seconds (no batch processing involved)
Query and reporting times: yet to be tested
Throughput: Managed by Heroku
Storage: Managed by Heroku

Security:

Security measures are provided in many aspects in this system.

User authentication:

Users will have to authenticate using the username and passwords. Depending on the access level each user will gain functionality of the system. Passwords can be changed by the user.

Login details:

Each user's login time and logout time will be recorded in the system, to make the tractability process easy in case of a faulty action.

Usability and ease of use:

Users will be provided with a complete user manual as a pdf. The interfaces are designed to make it easy for any potential user to get familiar with the system within 10 minutes. No additional training is required to use the system.

Capacity and scalability:

The system can accommodate many simultaneous users.

Availability:

The system will be available throughout the 24 hours. Mean time to failure and mean time to repair will be decided to increase the availability.

Maintainability:

The project is designed using the best practices of Agile Development and OOP. Since every single segment in the system is very well structured, the system is highly maintainable.

4. References

(groups.engin.umd.umich.edu/CIS/course.des/cis375/projects/, n.d.)
(eyefodder.com/2011/06/, n.d.)