**7. Proposed Solution**

**7.1 Description including Justifying choice**

The first step of the proposed solution was to evaluate the aesthetic design of the system. Draw.io was primarily utilised, as a means of producing detailed diagrams which were later presented as low-fidelity prototypes, with feedback and criticisms subsequently given by supervisors. Upon unanimous agreement as to which design to move forward with, more emphasis was placed on the functionality of the system.

Microsoft SQL was chosen for various reasons. It is a secure database management system, allowing for the efficient maintenance of data. It is also important to note that Microsoft SQL provides support for code first development with Entity Framework Core, being an extension employed with ASP.Net MVC.

To expand upon the aforementioned ASP.Net MVC, it is a technology that utilises web-based strategies whilst providing extensive backend functionality for server-side development. MVC, being the Model View Controller strategy, permits the segregation of the file structure as a means of placing focus on, web page views, server-side models, and controllers to mediate between the two.

The projected solution will be able to identify and allocate, through a one to one relationship, with one student for each supervisor, and vice versa. As has been observed through the discussions in [3], priority will be placed upon ensuring the allocation of a top preference, thus having this prioritization impact the final quality of the project. One of the main focuses will be to preserve the main points made in [3], keeping preferences as the primary allocation factor to the furthest possible extent.

Python and C# were used as programming languages whilst developing the functionality of the system. The use of these server-side languages resulted in the system returning results for allocation in a minimal timespan, usually measured in just a few seconds. Such a result proves to be better than the current system which involves hours of work to successfully perform allocations. Furthermore, having a system which works alongside an administrator may produce better result. As discussed by [4], the collaboration between an algorithm and human by means of a Human-Computer Interface (HCI) may produce more optimal results.

[3] [Andrew D. Madden,](https://www.emerald.com/insight/search?q=Andrew%20D.%20Madden)[Sheila Webber,](https://www.emerald.com/insight/search?q=Sheila%20Webber)[Nigel Ford,](https://www.emerald.com/insight/search?q=Nigel%20Ford)[Mary Crowder](https://www.emerald.com/insight/search?q=Mary%20Crowder), “The relationship between students’ subject preferences and their information behaviour“**,** [Journal of Documentation](https://www.emerald.com/insight/publication/issn/0022-0418) ISSN: 0022-0418, 9 July 2018, Available: <https://www.emerald.com/insight/content/doi/10.1108/JD-07-2017-0097/full/html>, [Accessed: 15-04-2020].

[4] D. Valeriani, “Humans and machines can improve accuracy when they work together “, The conversation, 11 March 2019, Available: <https://phys.org/news/2019-03-humans-machines-accuracy.html>, [Accessed: 16-04-2020].

**7.2 Task Breakdown**

The work was divided between each member of the group in the following manner:

1. Connor Sant Fournier was assigned as team leader and was given the task of working with all processes relating to the allocation algorithm and the optimization of these processes. Also, he worked alongside Nicole Cassar with back-end functionality and database management.
2. Nicole Cassar was assigned the role of scribe, whilst also being tasked with back-end development and database management. Nicole Cassar also assisted Caoimhe Camilleri with front-end tasks and data entry.
3. Caoimhe Camilleri was appropriated the front-end tasks and User Interface (UI) related development. Caoimhe also dealt with the majority of data entry involved amidst development.
4. The fourth team member Joshua Spiteri was assigned with the compilation of the documentation. Whilst doing such compilation, Joshua Spiteri also aided in data entry and completion of front-end tasks.

Each group member familiarized themselves with all tasks encapsulating the system in order to provide well revised input during meetings. This was done in order to gather needed information or to be able to tackle problems as a team, irrespective of whether members were assigned to the area of the issue or not.

It is also important to note, meetings with project supervisors proved beneficial as a means of ensuring and maintaining a balanced breakdown of workload.

**7.3 Project Plan and Methodology of Work**

The project was initiated with two meetings, serving as an introduction to help in better understanding the situation that current administrators find themselves in. Such meetings encapsulated the prevalent issues that were to be changed, as well as parts of the system that proved adequate, and should stand unchanged as a result.

Meetings were frequently set up with both Mr. Bonello, the main project supervisor, and Dr. Abela, being the co-supervisor. Any problems faced were discussed during such meetings, with frequent updates being delivered to them with regards to the progress made as a group. When a meeting could not be scheduled, the team leader updated the supervisors by means of email communication.

Good communication proves to be a major factor in having a high-quality solution. A group was created on the Messenger service provided by Facebook where discussions were held. To keep track of progress from each member of the group, Trello was utilised, with both supervisors being added as a means of being updated without having to await an email with information on progress.

Whenever progress was made, draft materials and resources were initially uploaded on Google Drive, enabling every group member to upload or download any material required. This also acted as a backup and prevented loss of data from occurring. With regards to the actual system and resources that proved more vital to the final project composition, a GitHub repository was set up, as a means of keeping each group members system up to date through version control.

During team meetings, each member brought forward any progress made, with suggestions for improvements subsequently discussed. To add to this point, new tasks were assigned after each meeting and a date for when tasks were to be complete and delivered was agreed upon. This allowed for a continuous flow of progress throughout the project life cycle. It is vital to point out that, although the group may have agreed as to the completion of a particular task, supervisors were to be the ultimate approval as to whether any given task was complete or required further refinement.