FIT3162: Advanced Computer Science Project 2
Project Proposal including Literature Review
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Word Count: 2523 Words

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1.0 Introduction

In late 2019, a virus named SARS-CoV-2 emerged from Wuhan, China, which resulted in a world pandemic. The disease was officially named Covid-19 or Coronavirus by the World Health Organization. Coronavirus is an infectious disease that transmits via droplet or contact transmission, and many people might not have the appropriate knowledge, acceptance, and perception of Covid. The objective of our project is to create a Q&A system that can provide information related to covid. Our team consists of four members, and to maximize our work efficiency. We agreed to assign a single role to each team member. Wai Han is our team's technical lead since he is technically inclined. He would take charge of the technical team. Next, Yeonsoo Kim is responsible for evaluating our code and ensuring its correctness. Nawwaf Ali is our quality assurance. His responsibility is to utilize our resources efficiently and effectively.

2.0 Project Management

2.1 Introduction

The use of procedures, techniques, abilities, knowledge, and experience to accomplish certain project goals in accordance with predetermined guidelines is defined as project management. Final deliverables in project management are subject to a limited amount of time and money (*What is Project Management?*, n.d.). According to Wrike, software project management is defined as planning, scheduling, resource allocation, execution, tracking and delivery of software and web projects (What is Software Project Management?, n.d.).

In order to ensure that our team is able to carry out our project and deliver the final product in time, we have followed the project methodology that was decided on at the beginning of the year. Our team had decided on using the predictive life cycle model. This was followed by listing out the requirements and deadlines in the Gantt chart so that we stay on track and in scope of the project. However, we did implement a few agile methodologies, such as frequent stand up meetings and weekly meetings in order to update each other on our respective progress. This altered agile methodology has been working fine for our team.

2.2 Project Management Methodology

Our team's methodology is based on the waterfall methodology, which follows stages and plannings of projects and which each stage needs to be completed to proceed to the next stages. We selected the waterfall methodology at first because we noticed that the final goal was already set for the project and we had a brief planning for what steps to go through.
Our team created a concrete Gantt chart to set stages, to have a clearer understanding of what stages need to be completed and to modify the plannings if there are missing steps or unnecessary steps.

However, when our team followed the steps that were planned to build the final product, we realised that there are a lot of limitations in the waterfall methodology and we decided to use agile methodology together because there were steps that are not completed as planned and we needed to have quick meetings to resolve the issue to modify the existing stages. So, we are using both waterfall and agile methodology currently.

The decision of methodology was helpful in adjusting the existing stages and plannings, which happened in Week 4 - 5 due to the failure of the Database server set-up. Based on our planning, the Database set-up stage must be completed in Week 4 - 5. Because of the issue, our team had multiple quick meetings with the supervisor to adjust the stages and plannings. After the meetings, we decided to focus on finishing the basic design of the front-end website first without having actual functionalities so that the website can be fully functional once the website connects the website to the Database server and fetches the required data. By using this approach, we still could follow the initial stages and plannings.

2.3 Project Resources

2.3.1 Execution

Our team would devote 12 weeks to the execution phase. For this project, we have a total of four team members. Wai Han and Yi Sen would be in charge of front-end development, while Yeonsoo and Nawwaf would be in charge of back-end development. The front-end team would be in charge of creating a Question and Answer website as well as a Repository page for browsing. The backend team would be in charge of configuring the connection using Microsoft Azure and preparing the data. The final task is to find similar questions given freely by the user through the Q&A page.

2.3.2 Management

Team members	Project Roles	Execution Roles
Yi Sen	Project Manager	Front-end
Wai Han	Technical Lead	Front-end
Yeonsoo	Evaluation and Correction	Back-end
Nawwaf	Quality Assurance	Back-end

During our planning phase in the last semester we have agreed on all the roles that we will take on during the execution phase. Now the project is in the execution phase and the project roles are still the same. The execution roles were decided at the beginning of the semester.

2.3.3 Planning

All the planning is done via a Gantt Chart. Refer to Appendix I for the Gantt Chart. Our team had a meeting with our project supervisor at the start of the semester and brainstormed the due date of each task for this semester.

i. What software tools were used related to Project Management

Software Tools	Purpose
Visual Studio Code	To code the front-end user interface
Microsoft Azure SQL	To code the back-end database
Visual Studio Code	To code the algorithm which connects the front-end with the back-end, and having query features

TeamGantt	Keep track of all our tasks throughout the semester
Google Docs	For our team to write all the written submissions
GitHub	For version control and collaboration
Discord	Source of communication
Whatsapp	Source of communication

2.3.4 Project Phases

Initiating

Identifying and understanding product needs is the initial phase in our process. Our team met during this phase to extensively research the subject of our project and the specifications for the final result. At our group meetings with our project supervisor, we have also made an effort to better explore the project's scope and requirements. We can have any questions answered during these discussions with our supervisor. We were able to provide the first proposal of the project scope statement at the conclusion of this stage.

Planning

The creation of an early prototype and project design comprise the second phase of our project. We can only execute this phase if the project scope and requirements from Stage 1 have been fulfilled. At this phase, it is further investigated what the project's preliminary stages, architectural design, hardware and software requirements, and project management tools are. Finally, to demonstrate the feasibility of our project design, we created a Project Initial Prototype and Design Report. The second step of our project consists of developing an early prototype and designing the concept. We can only move on with this step if the project scope and requirements from Stage 1 have been met. At this level, the project preparatory phases, architectural design, hardware and software requirements, and project management tools are thoroughly studied. Finally, we prepared a Project Initial Prototype to illustrate the viability of our project design.

Implementation

Following the proposal stage, we moved on to the implementation stage, where we created the QnA chatbot and the repository website. Following that, we load the dataset into the database and run the query method. After ensuring that our algorithm and website are operational, we proceed to test our reasoning to guarantee that there are no errors or defects.

Testing

With the implementation step completed, we confirm the accuracy of our work by producing the appropriate test scripts, which include all essential testing. Because of time restrictions, the two processes are completed concurrently.

Closing

The project is ready for its last step, Project Closing, once the documentation is done. During this step, we will present our final project presentation, which will include our entire project source code. As confirmation of project completion, a final project report will be generated.

2.4 Risk Management

Refer to Appendix II for the risk register.

In this section, we will discuss how risks that were triggered were handled.

Risk can be defined as the possibility of loss or injury (Manage risk, n.d.). Project risk is inevitable when it comes to any project, hence our goal is to always minimize the potential negative risks and try to maximize our potential positive risks. Risk management will then be applied to meet our project goal. In this section, we will be discussing the risks that were triggered during development, and how it was handled.

A risk that was triggered during development was our fifth risk. This risk was triggered when our back end team ran into problems with creating the database. This risk consequently led to another risk, which was the second risk. Due to the delay in the back end team's progress in creating the database and populating it with data, the front end team could not work on displaying database queries onto the webpage.

The risks were handled carefully by following the risk register. The first risk that was triggered was solved by holding a meeting with the project supervisor and every team member in order to solve the error messages that were arising. Subsequently, the second risk was handled by adjusting the deadlines to further dates which would still be within the overall project deadline, despite essentially forcing the team members to work on a tighter schedule.

2.5 Limitations

During the population of the database, we noticed that it is likely that the input data size will exceed the data storage limit of our DB server. The plain datasets have 10 gb size, but we found that after putting in 6737 data rows, which were simple nugget data, the disk space used is already 23 mb. The data storage limit can be a risk in the future because the plain text file size of the nugget data was only 1 mb but the DB server already used 23 mb.

However, this problem is not a very significant issue at this moment as the 23 mb used space includes all the DB data with configuration and settings as well. Moreover, we have a relatively large data storage limit, which is 32 gb compared to the plain dataset size, which is 10 gb.

If the issue becomes serious in the future, we are planning to modify the CONTEXT table which stores data including the entire texts of documents. We are planning to remove the text section of the CONTEXT table to solve the issue because all the sentences of the context data are stored in the SENTENCE table as well. If we do not store the entire text in the CONTEXT table, it will take a relatively long time to fetch the entire document text as we have to use SQL queries to combine sentences into a single context (document).

In addition to the data size problem, we faced an issue in inserting the data into the database as we have an extremely large datasets which include 350,000 numbers of documents.

Another issue we faced is that the DB server is located in the US and it takes a long time to do any operations on the DB server due to a time delay caused by the long physical distance. We cannot change the server location because we are currently using the free-version of Microsoft Azure SQL server and only US-server is provided for the free users. This is not a serious problem now, but it is likely that the issue will slow down the process speed of the final product and our progress in the future if we have to fetch multiple data at the same time.

2.6 Reflection

Overall the project management plan we implemented helped us immensely in terms of what role every member had to do involving the project and keeping us on track in terms of what to do every week. The Gantt Chart was immense, because it helped the team understand exactly what tasks needed to be done, what date these tasks had to be completed by, as well as by whom said tasks should be done by.

However due to the amount of technical issues that arose during the initial implementation stages of the project, this led to many stalls to the overall progress of the project, exposing one of the fatal flaws that come with choosing the waterfall methodology for our project management which is that waterfall methodology makes having changes in our plans difficult. Since everything has to be completed by a certain date or time, there is no room for many of the delays caused by the technical problems in our project. To deal with said problems that came up, we needed to re-plan again from scratch and integrate these problems into the project moving forward.

Another main shortcoming in our project management in terms of following through with the plans made involving having weekly meetings, but due to the fact that each team members schedules were very different and the work loads from other units taken by team members made the idea and reality of having weekly meetings very unsustainable, leading us to mainly having meetings when needed by planning ahead via whatsapp. These meetings however were very productive in dealing with the problems that arose during project inception and progressing the project.

In terms of what we could have done differently involving project management, we should have done more research into the software and tasks we would be needing to do. This would greatly reduce the chance of technical problems occurring and there is a high chance of predicting the technical problems and taking it into account when planning the project.

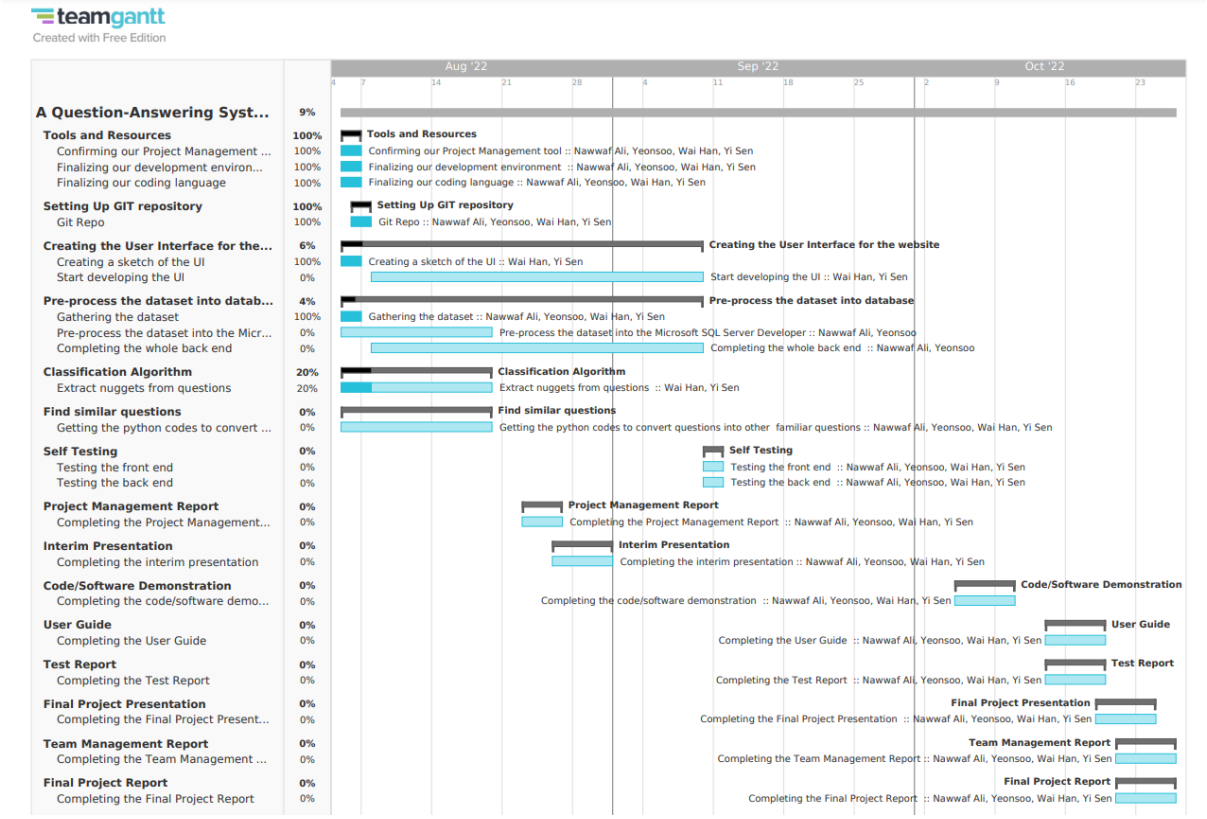
The obvious different way we could have dealt with the weekly meeting problem would be planning the time for the weekly meetings ahead while taking into account the future schedules or change it to planning a weekly meeting not on a particular day or just when needed.

3.0 Conclusion

In conclusion, The project management methodology we chose to follow was a hybrid of mainly waterfall methodology with the weekly meeting aspects of agile scrum methodology. Twelve weeks have been allocated to the execution phase of the project. Each team member has been given an execution role overall in the project as well as the software being used was changed and finalised during the implementation. A gantt chart was created with consultation from our supervisor for every task that needs to be completed and the due dates of each task. There are multiple phases in our project which were initiating, planning, implementation, testing and closing. We handled every risk that occurred according to our risk register such as the technical problems that came up on the back end which involved the database and also had a few problems in terms of having weekly meetings. Overall the project management plan was very effective, even though there were some shortcomings, the overall planning was followed and the contingencies that the risk register mentioned helped deal with the problems that came up.

4.0 Appendix

Appendix I



Appendix II

Risk Register for Computer Science Project

Prepared by: Yi Sen, Wai Han, Nawwaf, Yeonsoo **Date: 25/8/2022**

No.	Rank	Risk	Description	Category	Root Cause	Triggers	Potential Responses	Risk Owner	Probability	Impact	Status	Score
1	1	Team members	Team members are not contributing to the assignment as they should	People risk	Team members unable to contribute to the assignment	Team members falls sick due to covid vaccination, contracted covid, absent due to family matters	Other members to share his workload	Nawwaf Ali	9	9		81
2	3	Cannot complete allocated tasks	Team members are not completing their allocated tasks as they should	People risk	Poor time management of individually allocated tasks	Ongoing project clashes with workloads of other course units	Pre-allocate the team's time for working on the project and plan and work on the project ahead of time	Chan Wai Han	5	5		25
3	2	Insufficient technical skills	Team members have never worked on a project like this before and lacks the skills required	Internal Project Management (Team)	Algorithm risks when providing information	Algorithm contains biased logic, inappropriate modeling techniques and coding errors	Ensure sufficient research is made before using the algorithm	Yeonsoo Kim	5	7		35
4	5	Insufficient soft skills	Team members are not very good when it comes to communicating with other team members	People risk	Communication barrier	Idea conflicts between team members on project and lack of team monitoring	Team members have set up communication solutions such as a Whatsapp group to keep tight track of each other's work	Ooi Yi Sen	7	9		63
5	4	Cannot solve bugs, errors and warnings	Team members who are allocated with their respective tasks are unable to solve bugs, errors and warnings that arise during development.	Technical risk	Unfamiliar with the development platform or libraries used	Error messages arise during development which cannot be solved, thus delaying progress	Communicate with other members and project supervisor	Chan Wai Han	9	10		90

5.0 References

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6.0 Team Member’s Contribution Annex

Team Members’	Contribution
Yi Sen	Introduction, Project Resources
Wai Han	Introduction to Project Management, Risk Management
Yeonsoo Kim	Project Management Methodology, Limitations
Nawwaf Ali	Reflection, Conclusion