

Document Submission System

Project Plan

Software Engineering Project | 28

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SWE40001 EAT40003, Software Engineering Project A, Semester 1 AND 03/04/2022


DOCUMENT CHANGE CONTROL

Version	Date	Authors	Summary of Changes
1	25/03/2022	Adrian Sim Huan Tze	The entire document is formatted to the Cambria font style with 10-11 font size. All remarks are removed and put in the comment panel.
2	26/03/2022	Adrian Sim Huan Tze	Overview of Terms of Reference is added. Project objectives are summarized and included,
3	27/03/2022	Adrian Sim Huan Tze	Project Scope and Critical Success Factors are added.
4	27/03/2022	Jun Wee Tan	Section 7: Schedule is added
5	28/03/2022	Jun Wee Tan	Project timeline (Gantt chart) has been added into section 7.1 Project timeline
6	30/03/2022	Jun Wee Tan	Section 8: Budget is completed and added into document
7	31/03/2022	Adrian Sim Huan Tze	Modify and make adjustment on Project Goals and Project Objectives.
8	03/04/2022	Adrian Sim Huan Tze	Revise and review every section of the document. Some tables are reformatted.
9	18/05/2022	Adrian Sim Huan Tze	Revise and review every section of the document before resubmission

DOCUMENT SIGN OFF

Name	Position	Signature	Date
Jun Wee Tan	Team Leader		3/04/2022
Adrian Sim Huan Tze	Member		3/04/2022
Xin Zhe Chong	Member		3/04/2022
K.M. Yovinma M. Konara	Member		3/04/2022
Sandali T. Jayasinghe	Member		3/04/2022
Richard Ly	Member		3/04/2022

CLIENT SIGN OFF

Name	Position	Signature	Date
Caslon Chua	Client		4/04/2022
Organisation			
Department of Computing Technologies at Swinburne University of Technology			

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1. INTRODUCTION

1.1. BACKGROUND

The Document Submission System project came about from wanting students to increase their awareness of plagiarism and prevent students from committing it. This system will be predominately used by students and tutors in their respective courses at Swinburne University of Technology.

The purpose of this project is to conduct an analysis of the submitted work and check for plagiarism. Analysing submitted work will provide Swinburne University the necessary tools to check if students plagiarised and will serve as a reference for academic staff in grading students' work. This document will include a project goal, project scope, project objectives, standard procedures, deliverables, organisation and structure, risks, schedule, budget, and the overall description of the product.

1.2. KEY PROJECT PERSONNEL

The key personnel involve in this project are as follows:

1.2.1. CLIENT

Caslon Chua is the Department Chair in the Department of Computing Technologies at Swinburne University of Technology. Caslon Chua has requested to develop a web-based submission application which analyses submitted work and produce a text-based analysis report of the submitted work.

1.2.2. OTHER STAKE HOLDERS

Roles	Stakeholders	Responsibilities
Admin	Convenors	Check the submitted work and see if there are any forms of plagiarism. Can only perform data management on certain data which are related to his/her teaching units.
Admin	Swinburne School Departments	Departments from different faculties within Swinburne will also be using this to check and manage the data including editing, adding, updating and viewing the scores of the MCQ results and analysis results.
Users	Students	Submit their written work by uploading them to the application. Answer multiple-choice questions.

1.2.3. PROJECT SUPERVISOR, TEAM LEADER AND KEY PROJECT MEMBERS

Name	Roles	Responsibilities	Email
Jun Han	Supervisor	Makes sure the project team is on track to produce this application and deliver it to the client on time.	jhan@swin.edu.au
Jun Wee Tan	Project Team Members	Develop the web application. Handle the development of the product. Ensure that the prototype can be produced before the due date.	101231636@student.swin.edu.au
Xin Zhe Chong			103698851@student.swin.edu.au
Adrian Sim Huan Tze			101225244@student.swin.edu.au
K.M. Yovinma M. Konara			102426323@student.swin.edu.au
Sandali T. Jayasinghe			102849357@student.swin.edu.au
Richard Ly			103340644@student.swin.edu.au

Membership

The project group will comprise:

- ❖ Jun Han, Supervisor
- ❖ Jun Wee Tan, Leader, Cybersecurity major
- ❖ Adrian Sim Huan Tze, Member, Software Development major
- ❖ Xin Zhe Chong, Member, Data Science major
- ❖ K.M. Yovinma M. Konara, Member, Data Science major
- ❖ Richard Ly, Member, Software Development major
- ❖ Sandali T. Jayasinghe, Member, Data Science major

Roles and Responsibilities

The supervisor is accountable for:

- ❖ fostering collaboration
- ❖ always maintaining the focus of the group on the decided outcomes, scope and benefits
- ❖ supervising and controlling the external factors that are critical to its success.

The members of the group are accountable for:

- ❖ attending every scheduled group/supervisor/client meeting
- ❖ sharing all information and communication across all group members
- ❖ making well-timed decisions and taking actions to avoid procrastinating the project
- ❖ informing the entire group, as soon as practical, if any matter arises which may be deemed to affect the development of the project
- ❖ stay vigilant and alert to possible risks and matters that could influence the project once they occur
- ❖ open and honest discussions, without resort to any misleading assertions

Meetings

All meetings will be led by Jun Wee Tan (Team Leader).

Meeting minutes will be presented by each of the team member on a rotating basis, this includes:

1. arranging supporting papers and relevant documents
2. preparing meeting notes and information.

There are three types of meetings will be conducted throughout the project development.

- i. Client Meeting will be held on a fortnightly basis on Friday 2:30PM at Microsoft Team.
- ii. Supervisor Meeting will be held on a weekly basis on Friday 9:00AM at Microsoft Team.
- iii. Group Meeting will be held occasionally at Discord group channel.

If necessary, subgroup meetings will be organized outside of these times at a time convenient to subgroup members.

2. TERMS OF REFERENCE

Project Goal

The goal that drives the concept of the project is to develop a **document submission system** which accepts reports written by students from courses or departments. This can be accomplished by introducing a unique feedback mechanism to help academic staff like markers, graders and students understand ***what constitutes plagiarism and to increase the awareness of plagiarism among them***. In other words, the project encourages students or researchers to use paraphrasing techniques and citation in their report instead of committing plagiarism deliberately or accidentally.

2.1. OBJECTIVES

- Build a web application prototype which is document submission system, particularly focusing on uploading assignments, report analysis, generating multiple-choice questions, web searching on title-matching and performing CRUD backend operations. The prototype implemented must have these **5 domain level requirements** and it should be launched by the end of **Week 24**.
- The prototype should be able to accept document submitted by students. It should include the feature of uploading document and store the document to the database.
- The prototype should include the feature of extracting text from the document and perform analysis on searching keywords, gathering list of references used in the document as well as conducting sentiment analysis.
- The prototype is expected to carry out a web search against the assignment help portal with the keywords searched from the submitted assignment. The results obtained from the web search should be kept in the database.
- The prototype should be able to generate five multiple-choice questions from the extracted text. These questions are to be displayed to the student to answer.
- The prototype should send a summary of the result of multiple-choice questions to the convenor via email at the end of the day.

2.2. SCOPE

Boundaries of the project:

- The project will conduct research regarding the current state of contracting cheating. The scope of the research report includes studying the definitions and metrics of plagiarism and contract cheating.
- The project will develop a prototype of a document submission system which is web-based. The website will be hosted using AWS EC2 services. As for the backend server, a MySQL server hosted in AWS RDS services.
- The prototype will be able to support assignment submission and perform a report analysis on the submitted assignment. The report analysis will be solely a text-based analysis where it will analyse the tone, writing style, reference summary and sentiment analysis.

- During submission, the prototype will be able to generate five multiple-choice questions with answers from the assignment submission to complete the submission. The questions will be presented to the user in a procedural approach where the user will be redirected to a webpage to answer these questions. The user is expected to answer all the questions to complete the submission. The prototype will generate questions from different report sections randomly including Introduction, Methodology, Abstract, Discussion etc.
- The prototype will store the result of the report analysis. The result would contain information like word count, reference summary, content matching score, author, date etc. This information will be kept in MySQL database table.
- The prototype will notify the convenor through email comprising the result of analysis and the result of the multiple-choice questions once the overall result is set.
- The project will develop an admin-view of interface to support data management in the web application. The management comprises of fundamental CRUD database operations.

Identify project and prototype constraints:

- ❖ The report analysis could only support document which is submitted in PDF format.
- ❖ Code files are not allowed to be submitted to the portal as code analysis is not integrated.
- ❖ The prototype is not portable as it is limited to web application only and mobile application is not currently supported.

List assumptions regarding decisions outside the project team's control.

1. Assume that all the submissions are English-based report without any coding files.
2. Assume that each of the assignment submitted are of PDF format.
3. Assume that there are sufficient fundings given to support the project in hosting the web application using AWS cloud services.

2.3. CRITICAL SUCCESS FACTORS

- ❖ Academic writing skills and fundamental digital literacies.
- ❖ Comprehensive knowledge in contracting cheating and plagiarism particularly on the metrics and definitions.
- ❖ Well-defined project objectives and specifications.
- ❖ Experienced software developers with expertise knowledge on skills of database design, web development and basic NLP.
- ❖ Sufficient finance support and knowledge for AWS website hosting services.
- ❖ Practice effective project management and risk management.
- ❖ Clear communication and trust over the project team.
- ❖ Consider End Users and Implement User Testing.

2.4. ACCEPTANCE CRITERIA

For the system to be considered acceptable by the client, the system should perform the 5 domain level requirements listed below:

a. **Assignment submission**

The system should be able to support assignment submission. The users can upload their assignments in PDF document to the system.

b. **Report analysis**

The algorithm in the prototype system should analyse sections of the report. It will summarize the report and provide information like word count, reference summary, sentiment analysis result, author, date, etc.

c. **Web Searching**

The system should conduct a web search in the submitted solution against posted in the assignment help based on title-matching.

d. **Data storing**

Storing of assignments, questions, results from report analysis and answers from the MCQ by the candidates. This information will be kept in MySQL database table.

e. **Generate multiple choice questions**

Utilize the text extraction function to generate a set of questions to be answered by the candidates.

3. ESTABLISHMENT

3.1. PROCESSES, PROCEDURES AND STANDARDS

The software methodology applied in this project would be the Scrum methodology; the project is of a larger scale and thus has many requirements that can alternate with the progress of the project. Therefore, undertaking scrum methodology for this project ensures frictionless adaptability and organization of tasks required to be completed within the expected timeframe. Furthermore, the team expects to show continuous improvement in the project development in an agile mindset, where the scrum methodology assists in.

The project will be primarily adhered to the SDLC (*Software Development Life Cycle*). There will be a total of seven phases in SDLC consisting of planning, analysis, design, development, testing, implementation, and maintenance. The project inception starts off on **18th March 2022** which is during the planning phase while the estimated final day for this project will be on **16th September 2022**. The estimated duration of the project is **183 days** including semester break.

During the software development, any further maintenance, or updates to the contents of the project would be communicated via the Github repository created by the team. It is also important to note that the updates to the Github repository during the implementation phase will also be available to the client for viewing purposes. The use of version control ensures that the product be deployed in a successful manner. Each update would also be described textually under a README file to ensure that developers keep a detailed track of any changes or fixes to the product's previous version.

During the design phase of the software, following the principles of user-centred design, the client is involved in the design planning from the beginning. Involving the client in the design planning process will help us clarify the requirements of the client with the team. Client's/user's feedback would be collected and analysed regularly to make more client focused decisions in the product lifecycle. After the completion of the project, new changes could also be introduced to improve the client experience.

Coding standards will be followed to produce a well-manageable solution that is easy to interpret in the future. According to (Pal, 2019), these well-accepted standards are as follows:

1. Limited usage of global values – in the event of global values are used, the best practice is to aim constant values as global values.
2. Inclusion of standard headers for different modules implemented in the system – the format would consist of the following information to maintain proper documentation:
 - Name of module
 - Date of creation
 - Brief description of the purpose of implementing module
 - Functions implemented in the module

- Description of global constants used and its purpose (if any are required in the module)
3. Writing functions such that each conventionally named function carries out a non-repetitive singular task. This includes:
 - Usage of camelCase for module names, local variables, functions, SQL tables and fields
 - Not including digits in any module names, function names, SQL tables and fields
 - Usage of meaningful names for modules, variables, SQL tables and fields
 4. Indentation of code for increased readability. This includes following well-accepted standards such as:
 - Usage of whitespaces between function arguments if more than one is required
 - Indentation of code in each module created for easy readability
 - Usage of braces such that each brace lands on a new line (this standard is to be followed for all class, modules and conditions used in implementing the system)
 5. Inclusion of error handling in code – this is to ensure that errors are captured and dealt with in a standardized manner for producing high quality code
 6. Coding comments must be included, and its content must be easily comprehensible
 7. Aiming to keep the number of lines of code as minimal as possible – code refactoring would also occur with each completion of module to ensure that functions written are not unnecessarily lengthy.

3.2. PROJECT ENVIRONMENT

The project environment would be cloud-based where the project will be utilizing Amazon Web Services (AWS EC2) and its Relational Database Services (RDS) to host the solution on the cloud. The server account used for the solution is offered by the client which is a lab account. The solution will also include the usage of a database management system; for this solution, the MySQL server will be used to manage all the database related activities. A user account will also be created to manage all admin and subscription services used in the project. This will be created by the team and handed over to the client upon project completion. When the project is deployed, the solution will be uploaded to a web server for the client to utilize.

3.3. PROJECT TEAM SKILL DEVELOPMENT REQUIREMENTS

The skills needed by the group members for this can be categorized as project planning skills, web development skills, web hosting skills, programming skills and database management skills. Most of the team members have experience working with the above skill sets throughout their studies of the degree.

For extra expertise knowledge on skills like web development and programming, resources like online courses and tutorials could be used. The team members can also share each other's knowledge by sharing their skills and helping with ideas when problem solving.

4. DELIVERABLES, ACTIVITIES AND CAPITAL RESOURCES

4.1. DELIVERABLES

In this project, there are 11 items that need to be delivered to the client. This includes:

- a. Research report – The report regarding the current state, definition, and metrics of plagiarism and contract cheating
- b. Project Plan – A formal document, approved by the client to guide the execution and management of the whole project
- c. Software Quality Assurance Plan – A document containing the standards and practices that must be adhered for a quality delivery of the project
- d. Software Requirements Specification – A document describing the functionality of the prototype software
- e. Software Design and Research Report – A document containing high-level designs and concepts of the prototype software
- f. Test Plan – A document that includes the functionalities of the system to be tested.
- g. Completed web prototype – The prototype of the Document Submission System
- h. Product video – A video presentation featuring the functionalities and development process of the product.
- i. Final report – The documented process and functionalities of the system
- j. User training – Guiding the users to familiarise with the system
- k. Usability assessment – The document feedback from the users and their experience in using the prototype software

4.2. ACTIVITIES

The development process involved in this project primarily adheres to the Systems Development Life Cycle (SDLC). Therefore, the project is divided into 6 stages.

The first stage of the project is **planning**. In this process, we identify the project's background issue, risk, key project personnel, and business goals with the client by conducting a fortnightly meeting. The supervisor meeting is also held weekly to provide updates and progression to the project supervisor. This stage will start at week 3 and will continue throughout both semesters until the end of 2022.

The second stage of the project is **analysis**. In this process, we conduct studies and research on the topic of contracting cheating and plagiarism to better understand the current issues of contracting cheating and the metrics of plagiarism and cheating. This stage of the project begins on week 2 and ends at week 6. During this stage of the project, we will carry out a research report of existing work, materials and processes to comprehend on how students cheat and how they manipulate the flaws of existing solutions to their advantage. The project plan, software quality assurance plan, and the software requirements specification will also be carried out in this stage.

The next stage of the project is the **system design** phase which is done in parallel to the analysis stage. Within this stage, we will design a suitable system as the solution to the document submission issue by identifying the input, output, and process that should be supported by the document submission system. This is achieved by:

- UML diagram to describe the business rules, processes and features
- Use case diagram and use case description
- User interface drafting to provide a general outline and visualisation of the functionalities included within the developed system

The fourth stage of the project is **system implementation**. This stage starts from Week 10 to the end of Semester 2 of 2022. We will establish the development environment, configuring the tools and frameworks used, coordinating the code guidelines and standards as well as coding the system. At the end of this stage, the prototype system will be produced. At the very least, the login module for the system prototype will be completed on Week 12 of Semester 1, and the submission module will be completed on Week 14 of Semester 1.

The following stage of the project is **testing and integration** where the system will be evaluated at the end of Semester 2 of 2022 (3rd Oct 2022 to 17 Oct 2022) to determine the system's effectiveness and whether the system conforms to the previously stipulated requirements and features. Thus, it is planned to conduct a usability testing on the prototype of the document submission system to discover flaws and shortcomings. Necessary changes will be made to incorporate improvements and fixes to the system based on the findings of the usability testing.

Lastly, the final stage of the project will be adding **future enhancements** and improvements which can be implemented into the developed system. Some additional features that may not be a fundamental part of the system but will provide more convenience to the users will be included at this stage to integrate better into the overall education management infrastructure to deliver a higher degree of automation.

4.3. RESOURCES

For the project to be completed, certain software needs to be utilized for the system to perform its intended function.

In the software department, the website is hosted on Amazon EC2 by AWS so that the system can be carried out from multiple devices rather than relying on the host machine. The database system will be hosted on Amazon RDS so that the data can be stored on the cloud without relying on the host machine.

The campus library will be used for:

1. Carry out group meetings
2. Gather the information regarding contracting cheating

3. Programming technique development (PHP, MySQL)

5. ORGANISATION AND STRUCTURE

The following list provides the group of individuals involved with the project solution:

1. **Scrum team** – Responsible for providing project solution by analysing information related to creating the solution, developing and deploying the software and testing the solution with the users.
2. **Client** – Responsible for providing finances and feedback in the creation and deployment of the solution and approving of project components included for the solution.
3. **Business users** – Responsible for user testing the solution along with accurately and honestly providing feedback regarding the solution's functionality and interface.

The information presented in table 2 will be interpreted with the structure as follows with the example result presented in table 1:

Example: The research report deliverable and system design activity will involve only the members of the scrum team (group 1). This will be presented in the structure as follows:

<i>Activities</i> <i>Deliverables</i>	<i>1</i>	<i>2</i>	<i>3</i>
<i>Systems design</i>	<i>Yes</i>	<i>No</i>	<i>No</i>
<i>Research Report</i>	<i>Yes</i>	<i>No</i>	<i>No</i>

Table 1 Activities and Deliverables

The group numbers are assigned based on the list presented above where the group number corresponds to the numbered point in the group list.

<i>Activities</i> <i>Deliverables</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>
<i>Research and Analysis</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
<i>Research report</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>
<i>System development</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>
<i>Web prototype</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>
<i>Testing</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>
<i>Test Plan</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>
<i>User training</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Usability assessment</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>

Further enhancements	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Final report	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Planning	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Project Plan	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Software Quality Assurance Plan	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Software Requirements Specification	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Software Design and Research Report	<i>Yes</i>	<i>Yes</i>	<i>No</i>
Product Video	<i>Yes</i>	<i>No</i>	<i>No</i>

Table 2 Activities and Deliverables

6. RISKS

The risks that will affect the project plan are the unforeseen events that we will have to face during the completion of the project. It is important to analyse the risks related to the project plan as it helps with identifying weaknesses and strengths during the completion of the project.

Scope variation

Scope variations may occur when the workload of an agreed iteration changes. It will impact the team members' ability to carry on the work according to the original timeline.

Poor productivity

The group may sometimes fall short on the planned works within a timeframe which will make the group's productivity poor.

Team member leaving the project

A team member may leave the project during the project completion period which may delay the project outcomes.

Schedule flaws

Hard to estimate and schedule the time.

Poor quality code

When the quality of the project code does not meet the expectations of the client, it can be a risk to a successful project completion. Poor code refers to code that is difficult to comprehend and not tested. Events such as this may occur when the developers are rushing to complete their work.

Resource risks

Resource risks occur if there are insufficient resources like time, skills and budget to complete the project. It is important to communicate with the team about the status of the resources when available and needed.

Risks associated with this project.

Rank	Name / Description	Occurrence Probability (H/M/L)	Severity (H/M/L)	Mitigation Strategy Number	Contingency
1	Scope Variation	M	M	1	Carry out the project with the new scope
2	Poor Productivity	M	H	2	Introduce short iterations.
3	Team member leaving the project	L	H	3	Re-arrange the workload between the members.
4	Schedule flaws	M	M	4	
5	Poor quality Code	M	M	5	Recheck code for bugs and fix the code.
6	Resource Risks	M	M	6	Introduce new resources to the project.

Table 3 Risks

Strategies to mitigate the risks:

- 1) Constant involvement of client and team members to the project.
- 2) We can use burndown charts to track the group's productivity. Rather than having long project timelines, introduce short iterations (1-2 weeks) so that the work is manageable and there is always a sense of urgency to complete the workload.
- 3) Increasing the team's collaboration by sharing key information with the group and the supervisor during the weekly stand-up meetings. Practicing information sharing techniques like working in pairs, common code ownership will also reduce the risk.
- 4) Involving the team members in planning and estimating the project outcomes. Getting frequent feedback from the client and discuss the products regularly.
- 5) Carrying out code reviews. Creating clear code standards and guidelines. Testing all the codes for bugs and redundancy.
- 6) A resource allocation plan can be used to efficiently utilize the resources available to support the project goals. The chances of running out of resources in latter parts of the project can be minimized by this.

7. SCHEDULE

The schedule of this project is to ensure that every task, resource, and software development process is well managed and can be completed on time. Our group will be using the **Gantt Chart** from Microsoft Project to track our project timeline with start dates, end dates, and milestones in this software project.

7.1. PROJECT TIMELINE

Below is the Gantt chart that indicates all the due dates of the Document Submission System task in the planning, analysis, and design phase.

This timeline is in accordance to SDLC development phase which includes the Planning phase, Analysis phase, Design phase, Implementation phase, Testing and Integration phase and Maintenance phase. The estimated final day for this project will be on **30th of October 2022**.

	Task Mode	Task Name	Duration	Start	Finish	Predecessors	
0		Document Submission System Gantt Chart (Phase 1)	157 days	Fri 11/3/22	Fri 14/10/22		
1		Planning	51 days	Mon 28/3/22	Fri 3/6/22		
2		Project requirement meeting	1 day	Fri 11/3/22	Fri 11/3/22		
3		Fortnightly client meeting	57 days	Fri 18/3/22	Fri 3/6/22		
4		Fortnightly client meeting 1	1 day	Fri 18/3/22	Fri 18/3/22		
5		Fortnightly client meeting 2	1 day	Fri 1/4/22	Fri 1/4/22	4	
6		Fortnightly client meeting 3	1 day	Fri 22/4/22	Fri 22/4/22	5	
7		Fortnightly client meeting 4	1 day	Fri 6/5/22	Fri 6/5/22	6	
8		Fortnightly client meeting 5	1 day	Fri 20/5/22	Fri 20/5/22	7	
9		Fortnightly client meeting 6	1 day	Fri 3/6/22	Fri 3/6/22	8	
10		Weekly Supervisors meeting	57 days	Fri 18/3/22	Fri 3/6/22		
11		Weekly Supervisors meeting 1	1 day	Fri 18/3/22	Fri 18/3/22		
12		Weekly Supervisors meeting 2	1 day	Fri 25/3/22	Fri 25/3/22	11	
13		Weekly Supervisors meeting 3	1 day	Fri 1/4/22	Fri 1/4/22	12	
14		Weekly Supervisors meeting 4	1 day	Fri 8/4/22	Fri 8/4/22	13	
15		Weekly Supervisors meeting 5	1 day	Fri 22/4/22	Fri 22/4/22	14	
16		Weekly Supervisors meeting 6	1 day	Fri 29/4/22	Fri 29/4/22	15	
17		Weekly Supervisors meeting 7	1 day	Fri 6/5/22	Fri 6/5/22	16	
18		Weekly Supervisors meeting 8	1 day	Fri 13/5/22	Fri 13/5/22	17	
19		Weekly Supervisors meeting 9	1 day	Fri 20/5/22	Fri 20/5/22	18	

	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Res
GANIT CHART	20	Weekly Supervisours meeting 10	1 day	Fri 27/5/22	Fri 27/5/22	19	
	21	Weekly Supervisours meeting 11	1 day	Fri 3/6/22	Fri 3/6/22	20	
	22	Plan for collaboration tools with all skateholders	2 days	Fri 18/3/22	Mon 21/3/22	4	
	23	Identify key project personnel	2 days	Fri 18/3/22	Mon 21/3/22	4	
	24	Identify goals and background issue of the project plan	2 days	Fri 18/3/22	Mon 21/3/22	4	
	25	Identify risk associated with project	2 days	Fri 18/3/22	Mon 21/3/22	4	
	26	Analysis	53 days	Fri 18/3/22	Mon 30/5/22		
	27	Produce Project Plan	10 days	Mon 21/3/22	Fri 1/4/22	22,23,24,25	
	28	Produce Software Quality Assurance Plan (SQAP)	11 days	Mon 21/3/22	Mon 4/4/22	22,23,24,25	
	29	Project Specific Assessment Criteria	11 days	Mon 21/3/22	Mon 4/4/22		
	30	Produce Software Requirement Specification (SRS)	16 days	Mon 21/3/22	Mon 11/4/22	22,23,24,25	
	31	Produce Research report for contracting cheating and plagiarism	16 days	Mon 21/3/22	Mon 11/4/22		
	32	Software/System Design and Research Report (SDRR)	36 days	Mon 21/3/22	Mon 9/5/22	22,23,24,25	
	33	Product Video	45 days	Mon 21/3/22	Fri 20/5/22		
	34	Test Plan	52 days	Mon 21/3/22	Mon 30/5/22		
	35	Usability Assessment Plan	52 days	Mon 21/3/22	Mon 30/5/22		
	36	System Design	37 days	Fri 18/3/22	Mon 9/5/22		
	37	defined coding guideline (in SQAP)	11 days	Mon 21/3/22	Mon 4/4/22		
	38	User interface wireframe (in SRS)	16 days	Mon 21/3/22	Mon 11/4/22		
GANIT CHART	38	User interface wireframe (in SRS)	16 days	Mon 21/3/22	Mon 11/4/22		
	39	Use case diagram with task description (in SRS)	16 days	Mon 21/3/22	Mon 11/4/22		
	40	All High-level software architectural design (in SDRR)	36 days	Mon 21/3/22	Mon 9/5/22		
	41	UML class diagram (In SDRR)	36 days	Mon 21/3/22	Mon 9/5/22		
	42	Entity Relationship Diagram (ERD) for database	36 days	Mon 21/3/22	Mon 9/5/22		
	43	Software work-breakdown structure	36 days	Mon 21/3/22	Mon 9/5/22		
	44	System Implementation	102 days	Mon 9/5/22	Mon 26/9/22		
	45	Login module	17 days	Mon 9/5/22	Mon 30/5/22		
	46	create front-end user interface	6 days	Mon 9/5/22	Mon 16/5/22		
	47	create login database schema and object oriented class	6 days	Mon 9/5/22	Mon 16/5/22		
	48	create connection between user interface and database	6 days	Mon 16/5/22	Mon 23/5/22		
	49	Program user login form and validation	6 days	Tue 24/5/22	Mon 30/5/22		
	50	testing login module	1 day	Mon 30/5/22	Mon 30/5/22		
	51	Student Submission Module	72 days	Mon 9/5/22	Mon 15/8/22		
	52	create submission front-end page	6 days	Mon 9/5/22	Mon 16/5/22		
	53	create respective database infrastructure and link both front-end and back-end	6 days	Mon 1/8/22	Mon 8/8/22		
	54	create object oriented class	6 days	Mon 1/8/22	Mon 8/8/22		
	55	create upload, delete file function	6 days	Mon 8/8/22	Mon 15/8/22		
	56	create link MCQ question page	6 days	Mon 8/8/22	Mon 15/8/22		

	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Re
57		create system feedback function on submission	6 days	Mon 8/8/22	Mon 15/8/22		
58		testing submission module	1 day	Mon 15/8/22	Mon 15/8/22		
59		MCQ Question Module	11 days	Mon 1/8/22	Mon 15/8/22		
60		create MCQ question module front-end page	6 days	Mon 1/8/22	Mon 8/8/22		
61		create respective database infrastructure and link both front-end and back-end	6 days	Mon 1/8/22	Mon 8/8/22		
62		create object oriented class	6 days	Mon 1/8/22	Mon 8/8/22		
63		create generate question function based on user submission	6 days	Mon 8/8/22	Mon 15/8/22		
64		testing MCQ question module	1 day	Mon 15/8/22	Mon 15/8/22		
65		Admin Management Module	31 days	Mon 15/8/22	Mon 26/9/22		
66		create 4 sub-page (student submission, student list, question list, report analysis)	6 days	Mon 15/8/22	Mon 22/8/22		
67		create respective database infrastructure and link both front-end and back-end	11 days	Mon 22/8/22	Mon 5/9/22		
68		Create object oriented class	11 days	Mon 22/8/22	Mon 5/9/22		
69		create analysis function based on submission (sentiment, web search)	11 days	Mon 5/9/22	Mon 19/9/22		
70		create function for generate user analysis report	6 days	Mon 19/9/22	Mon 26/9/22		
71		testing admin management module	1 day	Mon 26/9/22	Mon 26/9/22		
72		Testing and Intergration	11 days	Mon 26/9/22	Mon 10/10/22		
73		integration and acceptance testing	6 days	Mon 26/9/22	Mon 3/10/22		
74		bug fixing	6 days	Mon 3/10/22	Mon 10/10/22		
75		Maintenance and support	4 days	Tue 11/10/22	Fri 14/10/22		
76		user training	4 days	Tue 11/10/22	Fri 14/10/22		

7.2. EXTERNAL DEPENDENCIES

Aside from internal dependencies in this project, there are no external dependencies involved.

7.3. ASSUMPTIONS

Assumption in arriving at the schedule:

Planning phase:

1. Assume both the weekly client and supervisor meeting has no delays or postponements.
2. Assume the background of the Document Submission System has been understood by every project stakeholder.
3. Assume the business goals, objective and key issue has been identified by all stakeholders.
4. Assume the feasibility and risks of the software has been considered by all stakeholders.
5. Assume the key project personnel has been identified by all stakeholders.

Analysis phase:

1. Assume all the requirement of the project has been discovered by project team members.
2. Assume all the requirement of the project has been documented in project plan.
3. Assume all the aspect of the software project such as Background, Key holders, objectives, project scope, establishment, deliverables, risk, schedule, and risks has been documented into Software Quality Assurance Plan (SQAP)

4. Assume the result of the project research has fulfilled the client's expectations.
5. Assume the budget allocated for software project is sufficient.
6. Assume the project members acknowledge the project's environment and possess sufficient skills.

Design phase:

1. Assume all the requirements of the project such as SRS has been proposed prior to the model design.
2. Assume the architectural modules of the product are clearly defined by design.
3. Assume all the high-level design are created and revised by all stakeholders.
4. Assume all the design model such as Software Architectural Framework, UML diagram, use case scenario, user interface wireframe, work-breakdown structure is well designed, and all the requirements stated in document are included.
5. Assume the client has involved in Design phase for overiewing the big picture of the software.

Implementation phase:

1. Assume all the project members acknowledged their responsibilities on their assigned task(s).
2. Assume all the project members have started developing the software by following the given work schedule.
3. Assume the client did not intervene and adding any last-minute feature(s).
4. Assume there are no communication, technical, nor knowledge issue among the project team.
5. Assume every project member knows how the software works and its background mechanisms such as the connection between front-end and back-end.
6. Assume each module of the project has successfully passed the tests conducted.

Testing and Integration phase:

1. Assume the integration of the module in project is completed successfully without any errors.
2. Assume the use case is successfully examined by the client.
3. Assume the feedback from the client is documented by project teams.
4. Assume the client is satisfied with the software prototype to pass the usability test.

Maintenance phase:

1. Assume all issues provided in the feedback are solved by the project team.
2. Assume the process of debugging any error in current software is solved.

8. BUDGET

Below is the table that describes the ideal personnel cost for this software project.

Personnel Cost

Name	Rate per Hour
Web developers	
Jun Wee Tan	\$27/hr
Sandali Thathsarani Jayashinghe	\$27/hr
Yovinma Mandini Konara Konara Mudiyansele	\$27/hr
Richard Ly	\$27/hr
Xin Zhe Chong	\$27/hr
Adrian Sim	\$27/hr

The rate per hour of web developers is referenced from payscale.com

Table 4 Personnel Cost

Time Estimated to Complete Each Task

The total contribute hours for this Document Submission System software will be control in 1200 hours (10 hrs per week x 20 weeks x 6 members). Each project members will be expected to work on project for at least 10 hour(s) per week, excluding weekends. The purpose of the time estimation is to ensure that all steps of software development are tracked and acknowledge by every stakeholder.

The subtasks under Analysis, Design, Implementation, Testing and Implementation, and Maintenance will be estimated 10 hour(s) per subtask, which is one week of working days.

Activity	Task	Estimated hours needed (hrs)	Total per activity (hrs)
Planning			
1	Produce requirement meeting	1	
2	Weekly Client meeting (total)	6	
3	Weekly Supervisors meeting (total)	12	
4	Plan for collaboration tools with all stakeholders	1	
5	Identify key project personnel	1	
6	Identify goals and background issue of the project plan	1	
7	Identify risk associated with project	1	23
Analysis			
1	Produce Project Plan	20	

2	Produce Software Quality Assurance Plan (SQAP)	20	
3	Project Specific Assessment Criteria	20	
4	Produce Software Requirement Specification (SRS)	20	
5	Produce Client Research report for Contracting Cheating and Plagiarism	20	
6	Software/System Design and Research Report (SDRR)	20	
7	Test Plan	20	
8	Usability Assessment Plan	20	
9	Product Video	20	180
System Design			
1	Define coding guideline (in SQAP)	10	
2	User interface wireframe (in SRS)	30	
3	Use case diagram with task description (in SRS)	20	
4	All High-level software architectural design (in SDRR)	30	
5	UML class diagram (In SDRR)	30	
6	Entity Relationship Diagram (ERD) for database	30	
7	Software work-breakdown structure	30	180
Implementation			
Login module			
1	Create front-end user interface	10	
2	Create login database schema and object-oriented class	50	
3	Create connection between user interface and database	50	
4	Program user login form and validation	30	
5	Testing login module	5	145
Student Submission Module			

1	Create submission front-end page	20	
2	Create respective database infrastructure and link both front-end and back-end	50	
3	Create object-oriented class	50	
4	Create upload, delete file function	20	
5	Create navigation link to MCQ question page	20	
6	Create system feedback function on submission	20	
7	Develop submission module	5	185
MCQ Question Module			
1	Create MCQ question module front-end page	20	
2	Create respective database infrastructure and link both front-end and back-end	50	
3	Create object-oriented class	50	
4	Create generate question function based on user submission	50	
5	Testing MCQ question module	5	175
Admin Management Module			
1	Create 4 sub-pages (student submission, student list, question list, report analysis)	50	
2	Create respective database infrastructure and link both front-end and back-end	50	
3	Create object-oriented class	50	
4	Create analysis function based on submission (sentiment, web search)	50	
5	Create function for generate user analysis report	50	
6	Testing admin management module	5	255
Testing and Integration			
1	Integration and acceptance testing	10	
2	Bug fixing	10	20
Maintenance and Support			
1	User training	10	10
Total Estimated hours			1173

Table 5 Task time estimate

9. REFERENCES

Hourly Rate for Industry: Web Development, payscale, viewed 1 April 2022,

<https://www.payscale.com/research/AU/Industry=Web_Development/Hourly_Rate>.

Pal, S., 2019. *Coding Standards and Guidelines*. [online] Geeks For Geeks. Available at:

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