

Group Assignment Cover Sheet

Never Stand Still

Faculty of Engineering

School of Mechanical and Manufacturing Engineering

- Please print clearly and complete all sections. All group members must sign the declaration below.
- Before submitting this assignment, students are strongly recommended to review the course outline, assessment requirements, UNSW's Plagiarism and Academic Integrity website and Administrative Matters on the School's website.
- Please retain a copy of this assignment for your records.

Course code: **GSOE 9820** _____ Course name: **Project Management, Term 2 2021**

Date submitted: 26/10/2021

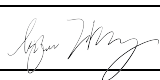
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We have retained a copy of this, our assignment, which we can provide if necessary. By signing this declaration we are agreeing to the statements and conditions above.

Team Attribution Survey and Signature Table

FAMILY NAME	GIVEN NAME(S)	STUDENT ID	CONTRIBUTION % (C)	SIGNATURE
ZHONG	LIJUN	5243425	25	
ZHOU	QIYAO		25	
ZHANG	RUNSEN		25	
WANG	TIANRU	5323309	25	Tianru Wang

Grading procedure:

1. The report is marked according to the marking guide giving raw grade **R**.
2. The team's demonstrator will check, modify if necessary, and approve the team attribution survey.
3. The approved contribution of a group member is **C**.
4. Each group member receives a final grade **F = R x C x N** (where **N** is number of group members).
5. You will be individually notified of **F** and **R**.

1. Scope Statement

This project is to build the UNSW Learning and Growing Platform under 250,000 AUD within 6 months. It will deliver a website and an application to fulfill the purpose whose functions include career development, study groups and experience sharing about employment knowledge., in addition to the supporting PM activities. It will also deliver end-user and admins training. This project will not include the convening of company recruitment information. Finally, this project help UNSW students who are looking for professional skills help.

1.1 Description of Project Rationality

Although UNSW has the world's top employment rate and employer reputation, there are still some graduates who cannot find suitable jobs. In order to help these students find their dream jobs to a greater extent, this project plans to build a learning platform.

1.2 Deliverables

The main deliverable of the project is a fully functional learning platform, including website, software and UI. Specifically, the main deliverables fall into the following three categories.

1.2.1 Program

Application software installation program and software and website source code

1.2.2 Plug-ins and library files

Third party plug-ins, development kits, and library files necessary to execute administrative tools

1.2.3 Documents

Description of the software itself, including interface description, main function realization and code description

1.3 Acceptance Criteria

The project will be considered complete when all testing of the platform is completed and the official first version of the website and software is released.

The specific acceptance requirements are as follows:

- 1)Acceptance materials are complete
- 2)All functions required by the project can be realized

- 3) Friendly interface, easy to interact
 - 4) The platform itself and its functions are stable without gross error
 - 5) All errors found during testing are corrected
- In addition, the way of acceptance is network acceptance

1.4 Constraints

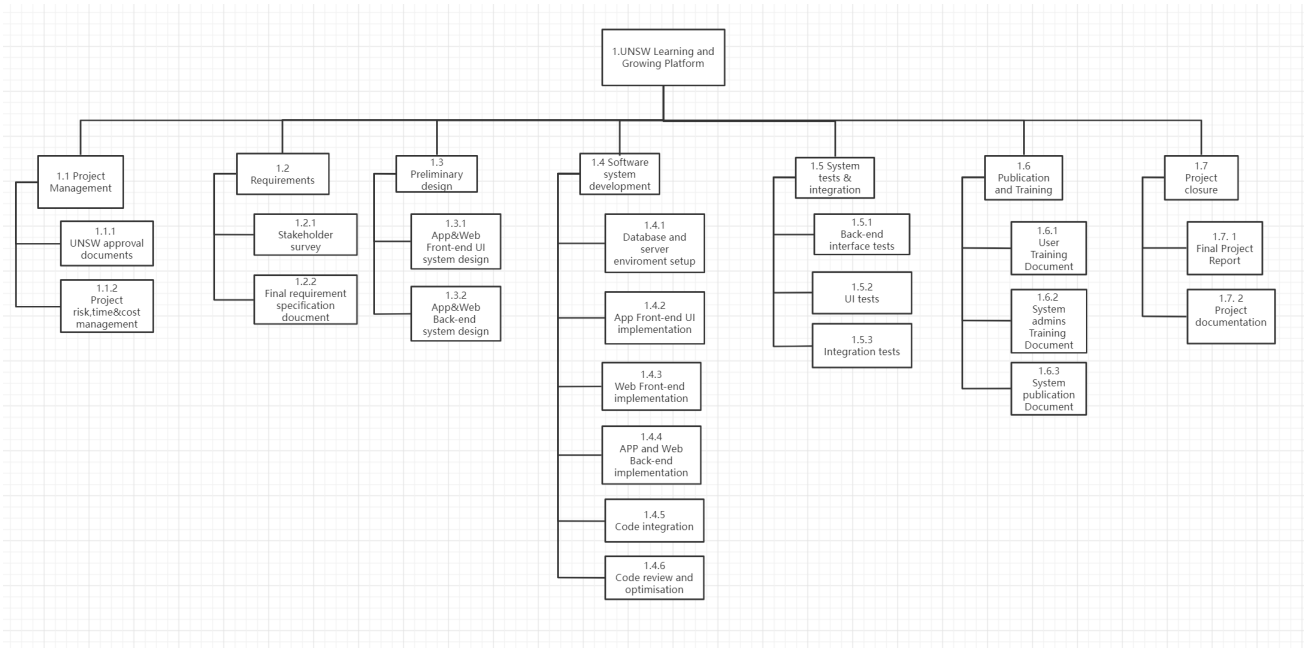
This project, UNSW Learning and Growing Platform, will cost no more than 250,000AUD within 9 months. The fund of project is provided by Tong Ju, who is the sponsor of this project.

1.5 Assumptions

The UNSW learning and growing platform building project will be launched on the premise of providing hardware such as computers and offices. In addition, all required materials will be delivered on time, and school officials and students will be happy to participate in the platform construction process, especially in the private beta.

In case of unexpected events such as inclement weather or large-scale power failure during the construction period, it can be postponed appropriately, but not more than one week.

2.WBS



2.1 Deliverables Breakdown

Work Package	Activity
1.1.1 UNSW approval documents	1.1.1.1 Project sponsor signoff
	1.1.1.2 Internal UNSW compliance signoff
1.1.2 Project risk, time & cost management	1.1.2.1 Project risk management document
	1.1.2.2 Project time & cost management document
1.2.1 Stakeholder survey	1.2.1.1 Make a Stakeholder survey
	1.2.1.2 Make market research
1.2.2 Final requirement specification document	1.2.2.1 Make a requirement survey
	1.2.2.2 Write final requirement specification document
1.3.1 App & Web Front-end UI system design	1.3.1.1 App Front-end UI system design
	1.3.1.2 Web Front-end UI system design
1.3.2 App & Web Back-end system design	1.3.2.1 Back-end interface design
	1.3.2.2 Back-end database design
	1.3.2.3 Back-end infrastructure design
1.4.1 Database and server environment setup	1.4.1.1 Database server setup
	1.4.1.2 Back-end server setup
1.4.2 App Front-end UI implementation	1.4.2.1 App Front-end coding
1.4.3 Web Front-end implementation	1.4.3.1 Web Front-end coding
1.4.4 APP and Web Back-end implementation	1.4.4.1 Back-end coding
1.4.5 Code integration	1.4.5.2 Front-end and Back-end Code integration

1.4.6 Code review and optimization	1.4.6.1 Code review
	1.4.6.2 Code optimization
1.5.1 Back-end interface tests	1.5.1.1 Back-end interface test
	1.5.1.2 Back-end interface test report
1.5.2 UI tests	1.5.2.1 UI test
	1.5.2.2 UI test report
1.5.3 Integration tests	1.5.3.1 Front-end and Back-end integration test
	1.5.3.2 Front-end and Back-end integration test report
1.6.1 User Training Document	1.6.1.1 Write User manual
	1.6.1.2 User training
1.6.2 System admins Training Document	1.6.2.1 System admin manual
	1.6.2.2 System admin training
1.6.3 System publication Document	1.6.3.1 System publication manual
	1.6.3.2 System publication training
1.7.1 Final Project Report	1.7.1.1 Write final project report
1.7.2 Project documentation	1.7.2.1 Save project documents
	1.7.2.2 Save project codes

3. Stakeholder Management

3.1 Overview

Stakeholder management is a crucial part of the project management plan. It mainly focuses on identifying project stakeholders and promoting the communication between project and stakeholders, so as to meet the requirements of project stakeholders and facilitate the timely solution of possible problems.

3.2 Management Method

According to Power Influence Grid in data representation methods [1], we can identify the type of relationship the project needs to establish with each stakeholder to distinguish the various stakeholders of this project. In addition, we manage stakeholder participation through Stakeholder Engagement Assessment Matrix [2]. And with the guidance of the grid, we can generate a reasonable communication plan with all of the stakeholders.

3.3 Stakeholders Identification

Based on the principle of power influence grid, all of the stakeholders can be divided into four categories called 'A B C D' which represent different kind of relationships that need to be built. These relationships are as followed:

A: satisfaction

Stakeholders in A are characterized by "great power and low attention to project results", so it is crucial to win the support of relevant parties in A for the success of the project

B: The key management

They have a high level of authority over the project and are concerned about the results of the project. The project manager should "focus on management, timely report, and take forceful actions to satisfy the relevant parties in B.

C: Keep inform

Despite the low power of the relevant parties in C, they pay attention to the results of the project. So, the project manager is "keep inform" of the status of the project. To maintain the satisfaction of the parties concerned in C. Underestimating the interests of the parties involved in C can have dangerous consequences and may lead to opposition from the parties involved in C.

D: Supervision

Properly address the needs of interested parties in D. Related parties in D are characterized by "low power and low attention to project results", so the project manager can mainly "supervise them with the least effort".

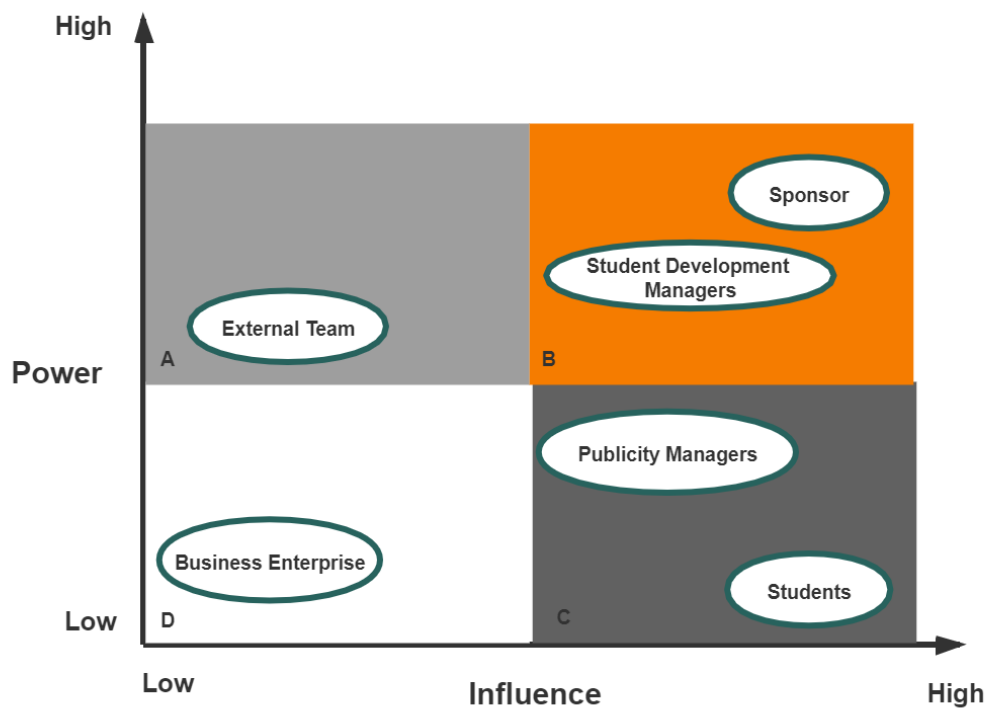


Figure 3.1 Power Influence Grid

Table 3.1 Identified Stakeholders

Category	Stakeholders	Interest
A	External implementation team	Responsible for the overall design of the platform and the implementation of specific function
B	Sponsor	Give guidance and suggestions to the project, gain support for the project by presenting it to the rest of the organization
B	UNSW student development managers	To find future directions for more graduates
C	UNSW publicity managers	Promote the school through better employment data advantages
C	UNSW students	Allow UNSW students have better chance to find their dream job after graduation
D	Business enterprise	Have better chance of hiring the right graduates

3.4 Stakeholders Engagement

Stakeholder Engagement Assessment Matrix is used to compare the current level of stakeholder participation with the expected level of participation. Stakeholder Engagement Assessment Matrix divide stakeholders into five positions: Unaware, Resistant, Neutral, Supportive and Leading.

Table 3.2 The Engagement Level Of Stakeholders

Stakeholders	Unaware	Resistant	Neutral	Supportive	Leading
External implementation team			C		D
Sponsor				CD	
UNSW student development managers			C		D
UNSW publicity managers			C		D
UNSW students			C		D
Business enterprise	C		D		

C = Current D = Desired

In Table 3.2, C represents the current level of participation of each interested party, while D is the level of participation (expected) assessed by the project team as necessary to ensure the success of the project.

4. Communication Plan

4.1 Overview

Project communication plan is a part of the overall project plan, which is very important and often overlooked. Understanding the organizational structure and doing stakeholder analysis are the most important aspects of developing a project communication plan. There are many forms of communication in the project, usually divided into written and oral forms.

4.2 Communications Tools and Skills

Communication tools:

Conferences, face-to-face conversation, online meeting, telephone, Email, websites and other technologies.

Communication skills [3]:

1. Listen actively. Interact with the speaker and summarize the conversation to ensure an effective exchange of information.
2. Understand cultural and personal differences. Promote team awareness of cultural and personal differences to reduce misunderstandings and improve communication skills.
3. Identify, set and manage stakeholder expectations. In consultation with interested parties, reduce conflicting expectations in interested parties' communities.
4. Involve interested parties in project meetings. Project meetings should be attended by stakeholders from outside the project and even, where appropriate, outside the organization.

TABLE 4.1 COMMUNICATIONS PLAN

Communication Type	Receive	Owner	Medium	Content
Daily Report	Team Leaders	External implementation team	Email, websites	The process of a particular project
Weekly Report	Sponsor, UNSW student development managers	Team Leaders	Face-to-face/online meeting	The process of the whole project
Monthly Report	Sponsor, UNSW student development managers	Team Leaders	Email	The process of the whole project
Public Report	UNSW Students	Sponsor, UNSW student development managers	social media, website	The process of the whole project
Emergency	Sponsor, UNSW student development managers	Incident Leader	Telephone, face-to-face/online meeting	possible problems and solutions
Milestone Event	The public	UNSW publicity managers	Social media, website	The phased progress of the project

5. Cost Estimate

5.1 The Detail of Total Cost

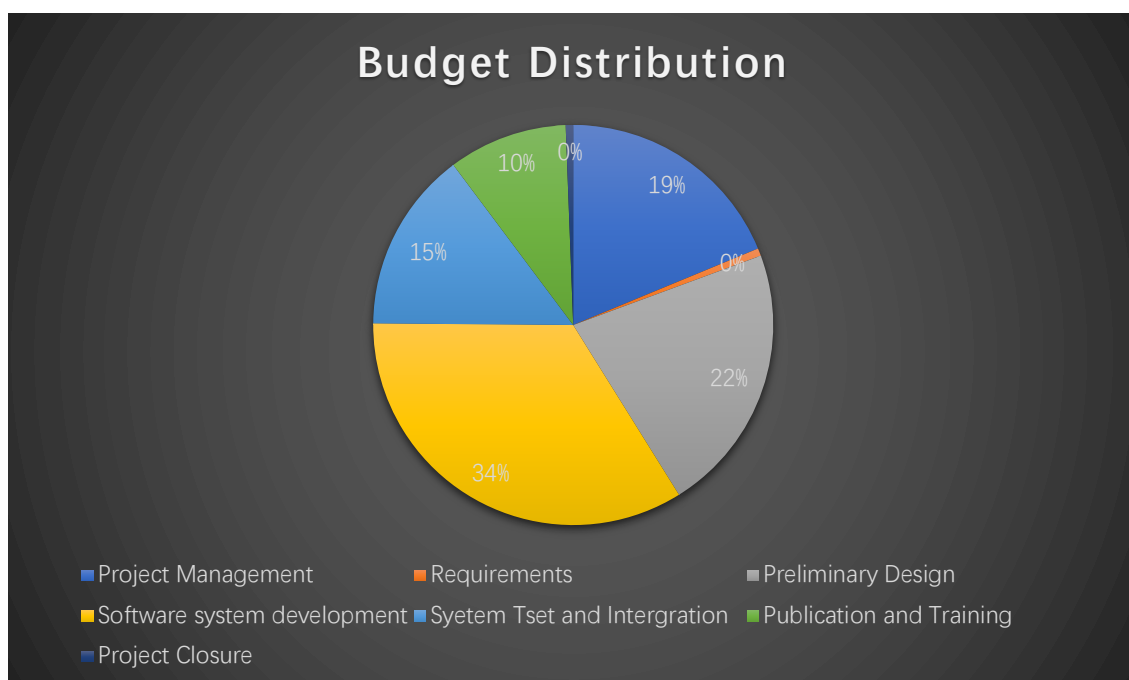
Project Management											
Total Cost (\$): 35377											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.1.1.1	Project sponsor signoff	0	0	0	0	1	4	0	0	0	0
1.1.1.2	Project risk management	104	1	0	0	0	0	6757	0	0	6757
1.1.2.2	project time and cost management	0	0	0	0	12	1	0	0	0	0
	Monitor and Control Project	0	0	0	0	928	1	28620	0	0	28620
Requirements											
Total Cost (\$): 1146											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.2.1.1	Make a stakeholder survey	0	0	0	0	30	4	0	0	0	0
1.2.1.2	Make market research	0	0	0	0	70	4	0	0	0	0
1.2.2.1	Make a requirement survey	0	0	0	0	15	2	0	0	0	0
1.2.2.2	Write final requirement specification document	8	1	0	0		0	1146	0	0	1146

Preliminary Design											
Total Cost (\$): 41036											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.3.1.1	APP Front-end design	0	0	190	1	0	0	9945	0	0	9945
1.3.1.2	Web Front-end UI system design	0	0	152	1	0	0	7952	0	0	7952
1.3.2.1	Back-end interface design	0	0	132	1	0	0	6909	0	0	6909
1.3.2.2	Back-end database design	0	0	178	1	0	0	9316	0	0	9316
1.3.2.3	Back-end infrastructure design	0	0	132	1	0	0	6909	0	0	6909
Software system development											
Total Cost (\$): 63931											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.4.1.1	Database server setup	0	0	152	2	0	0	7952	0	0	15904
1.4.1.2	Back-end server setup	0	0	128	2	0	0	6696	0	0	13392

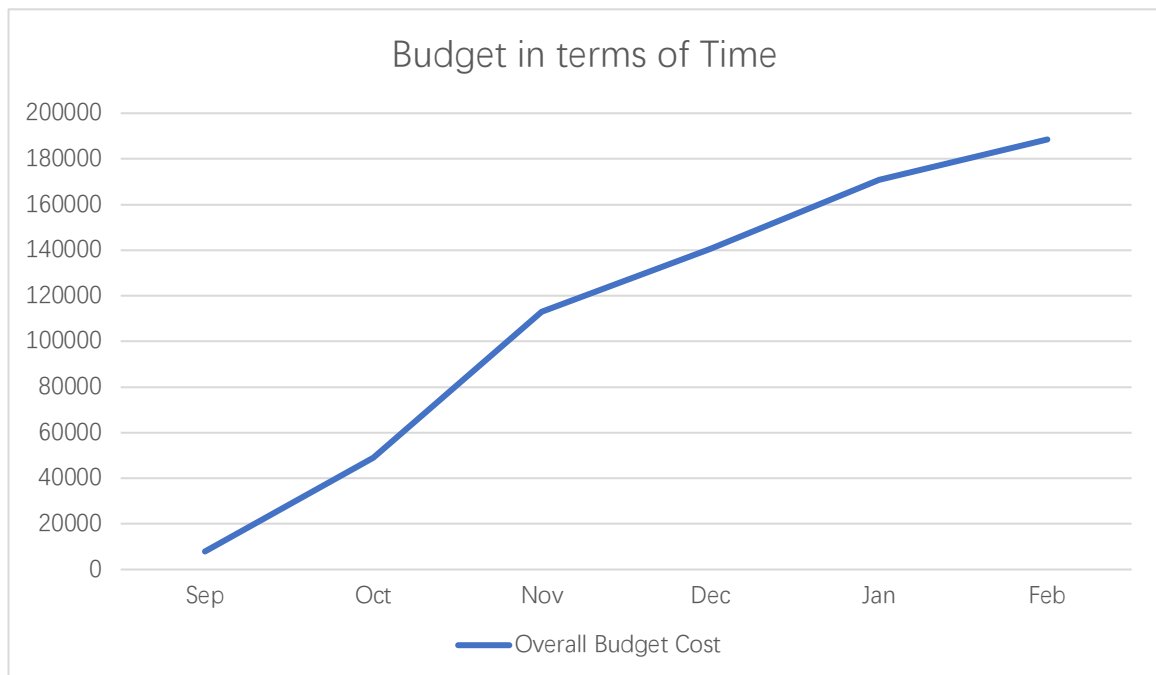
1.4.2.1	APP Front-end coding	0	0	123	2	0	0	6434	0	0	12868
1.4.3.1	Web Front-end coding	0	0	116	2	0	0	6068	0	0	12136
1.4.4.1	Back-end coding	0	0	208	2	0	0	10881	0	0	21762
System Test and Integration											
Total Cost (\$): 27664											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.4.5.2	Front-end and Back-end Code integration	0	0	76	1	0	0	5836	0	0	5836
1.4.6.1	Code review	0	0	38	1	0	0	1146	0	0	1146
1.4.6.2	Code optimization	0	0	38	1	0	0	4690	0	0	4690
1.5.1	Back-end interface test and report	0	0	128	1	0	0	5755	0	0	5755
1.5.2	UI test and report	0	0	128	1	0	0	3308	0	0	3308
1.5.3	Front-end and Back-end Code test and report	0	0	128	1	0	0	5755	0	0	5755
1.6.1.1	Write User manual	0	0	18	1	0	0	1169	0	0	1169

Publication and Training											
Total Cost (\$): 18196											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
16.1.2	User training	0	0	78	2	0	0	5067	0	0	10135
1.6.2.1	System admin manual	0	0	38	1	38	1	2469	0	0	2469
1.6.2.2	system admin training	0	0	38	1	38	1	2469	0	0	2469
1.6.3.1	System publication manual	0	0	24	1	24	1	1559	0	0	1559
1.6.3.2	system publication training	0	0	24	1	24	1	1559	0	0	1559
Project Closure											
Total Cost (\$): 1169											
ID	Activity	Labour							Equipment		cost
		Expert		Worker		Volunteer		Salary			
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.7.1.1	Write final project report	0	0	18	1	0	0	1169	0	0	1169
1.7.2.1	Save project documents	0	0	0	0	8	1	0	0	0	0
1.7.2.2	Save project codes	0	0	0	0	8	1	0	0	0	0

5.2 Budget Distribution



5.3 Budget In terms of Time



ID	Description	Preceding Activity	Duration	Early Start	Early Finish
~	Project Start	~	~	~	~
1	Project Management		162	0	162
1.1.1.1	Project sponsor signoff	~	1	0	1
1.1.2.1	Project risk management		162	0	162
1.1.2.2	Project time and cost management	1.1.1.1	2	0	2
	Monitor and control Project		162	0	162
1.2.1.1	Make a stakeholder survey	1.1.2.2	5	2	7
1.2.1.2	Make market research	1.1.2.2	10	2	12
1.2.2.1	Make a requirement survey	1.2.1.2	3	12	15
1.2.2.2	Write final requirement specification document	1.2.2.1	2	15	17
1.3.1.1	APP Front-end UI system design	1.2.2.2	30	17	47
1.3.1.2	Web Front-end UI system design	1.2.2.2	25	17	42
1.3.2.1	Back-end interface design	1.3.1.2	20	42	62
1.3.2.2	Back-end database design	1.3.1.2	27	42	69
1.3.2.3	Back-end infrastructure design	1.3.1.2	25	42	67
1.4.1.1	Database server setup	1.3.2.2	27	69	96
1.4.1.2	Back-end server setup	1.3.2.2	15	69	84
1.4.2.1	APP Front-end coding	1.4.1.1	15	96	111
1.4.3.1	Web Front-end coding	1.4.1.1	15	96	111
1.4.4.1	Back-end coding	1.4.1.2	30	84	114
1.4.5.2	Front-end and back-end Code integration	1.4.4.1	10	114	124
1.4.6.1	Code review	1.4.5.2	5	124	129
1.4.6.2	Code optimization	1.4.6.1	5	129	134
1.5.1	Back-end interface test and report	1.4.6.2	10	134	144
1.5.2	UI test and report	1.4.6.2	10	134	144
1.5.3	Front-end and back-end Code test and report	1.4.6.2	10	134	144
1.6.1.1	Write User manual	1.5.3	2	144	146
1.6.1.2	User training	1.6.1.1	8	146	154
1.6.2.1	System admin manual	1.5.3	5	144	149
1.6.2.2	System admin training	1.6.2.1	5	149	154
1.6.3.1	System publication manual	1.5.3	3	144	147
1.6.3.2	System publication training	1.6.3.1	3	147	150
1.7.1.1	Write final project	1.6.2.2	2	154	156
1.7.2.1	Save project documents	1.7.1.1	1	156	157
1.7.2.2	Save project codes	1.7.1.1	1	156	157

6.Schedule

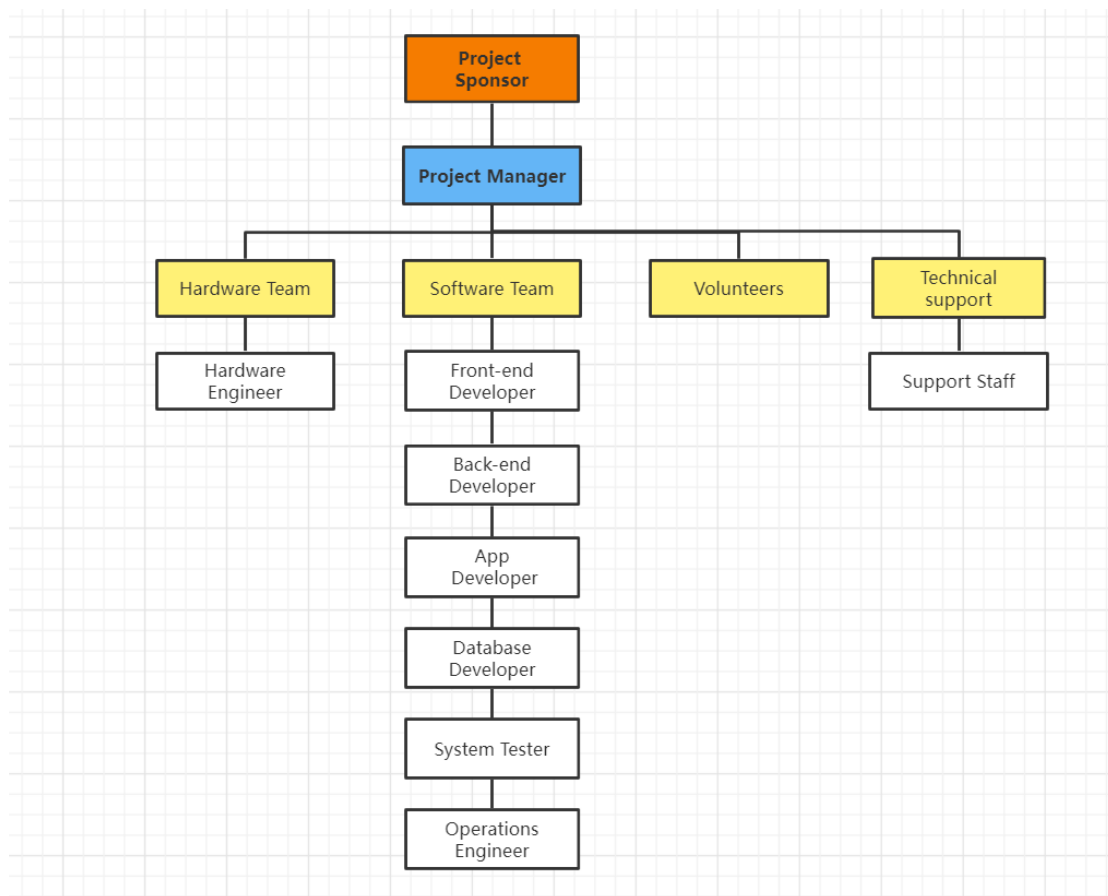
Please refer next page for project schedule .

7.1 Human Resource Plan

7.1.1 Overview

In this project, we will acquiring our human resources in two ways. First is hiring staff online, the second is hiring staff from UNSW. For online hiring, we need some experienced engineers to complete the project efficiently. For hiring in UNSW, we need some volunteers and they will benefit from this project.

1.1.2 Project Organization Chart



1.1.3 Role and Responsibilities (RACI)

Work Package	Project Manager	Front-end Developer	Back-end Developer	App Developer	Database Developer	System Tester	Operations Engineer	Hardware Engineer	Support Staff	Volunteers
1.1.1 UNSW approval documents	A,C									R
1.1.2 Project risk, time&cost management	A,C									R
1.2.1 Stakeholder survey	A,C									R
1.2.2 Final requirement specification document	A,C									R
1.3.1 App&Web Front-end UI system design	I	R		R						
1.3.2 App&Web Back-end system design	I		R		R		R			
1.4.1 Database and server environment setup	I				R		R	R		
1.4.2 App Front-end UI implementation	I			R						
1.4.3 Web Front-end implementation	I	R								
1.4.4 APP and Web Back-end implementation	I		R		R		R	R		
1.4.5 Code integration	I	R	R	R	R					
1.4.6 Code review and optimization	I	R	R	R	R	R				
1.5.1 Back-end interface tests	I					R				
1.5.2 UI tests	I					R				
1.5.3 Integration tests	I					R				
1.6.1 User Training Document	I								R	R
1.6.2 System admins Training Document	I								R	R
1.6.3 System publication Document	I								R	R
1.7.1 Final Project Report	A,C									R
1.7.2 Project documentation	I									R

7.1.4 Position Descriptions

Project Manager:

Responsibilities: Defining project scope, roles & responsibilities, defining resource requirements and managing resource. Preparing a detailed project management plan to schedule key project time. Managing delivery of the project. Tracking project, managing, and adjusting for changes in project scope, schedule, and budget. Ensuring the project is delivered to their satisfaction.

Experience: Have at least 1 previous experience in project management.

Duration: Full project, 6 months, Full-Time.

Front-end Developer:

Responsibilities: The design of the Web front-end, communicate with other parts of the project.

Experience: 3 years of front-end development experience required.

Duration: Full project, 6 months, Full-Time.

Back-end Developer:

Responsibilities: The design of back-end functions, interfaces. Communicate with other parts of the project

Experience: 3 years of back-end development experience required.

Duration: Full project, 6 months, Full-Time.

App Developer:

Responsibilities: The design of App-front end, communicate with other parts of the project.

Experience: 3 years of App development experience required.

Duration: Full project, 6 months, Full-Time.

Database Developer

Responsibilities: Design of system database.

Experience: 3 years of Database development experience required.

Duration: Full project, 6 months, Full-Time.

System Tester:

Responsibilities: System front-end and back-end testing.

Experience: 3 years of software test experience required.

Duration: Full project, 6 months, Full-Time.

Operations Engineer:

Responsibilities: The operations engineer is responsible for maintaining and ensuring the high availability of the whole service, continuously optimizing the system architecture, improving deployment efficiency, optimizing resource utilization and improving the overall ROI.

Experience: 3 years of operations experience required.

Duration: Full project, 6 months, Full-Time.

Hardware Engineer:

Responsibilities: Set up and operation of the whole system server.

Experience: 3 years of hardware experience required.

Duration: Full project, 6 months, Full-Time.

Support Staff:

Responsibilities: Project support, preparation of project documents and customer service

Experience: 1 years of support experience required.

Duration: Full project, 6 months, Full-Time.

Volunteers:

Responsibilities: Project preparation, make some survey and make advertisement.

Experience: No experience required.

Duration: Full project, 6 months, Part-Time.

7.1.5 Training

There are some training programs for project staff.

Training Program	Recommended recipients
Basic project knowledge, project requirements and design specifications, code style writing specifications, document writing specifications.	All
Learn the machine learning algorithms required for some projects from some online courses.	Specific
Some online courses on effective teamwork.	All
Customer service training for this project.	Specific
Some course from UNSW lectures related to this project	Specific

8. Risk Management

8.1 Overview

For most projects, there are too many situations that can directly threaten the project's existence beyond the planned time and budget. In fact, there is no project without any risk. This is because each project is a unique enterprise with varying degrees of complexity. At the same time, any project has its purpose, including profitability or the benefit of the target population. In this way, the identification, analysis, processing and monitoring of potential risks are particularly important. This risk management plan will follow the procedures recommended in the PMBOK and analyze how to assess and manage the risks of the UNSW Learning and Growing Platform project.

8.2 Risk Management Planning

Combining the project life cycle time plan and budget plan management risk activities, we have carefully identified potential risks for the UNSW Learning and Growing Platform project and listed all estimated risks in detail. At the same time, according to the matrix assessment risk method, after fully considering the possible impact on the stakeholder, the corresponding possibility and potential consequences of the impact level are classified. Finally, in order to reduce the potential impact of risks and even avoid some risks from appearing, a series of solutions and contingency plans are proposed for potential risks to seek and budget estimates for these methods.

8.3 Risk Identification

According to the method mentioned in PMBOK (PMI, 2017) [4], project team members can collect risk data with reference significance through risk identification activities such as brainstorming, cross-checking and visiting professionals. In risk identification activities, project managers, project team members, project sponsors, and users are all participants. In each different operating phase of the project, the number and level of risks may change accordingly. Under such circumstances, formulating a risk management plan is particularly important for dealing with risks in a positive and effective manner. Therefore, the members of this group compiled the detailed information of the risk registration.

8.4 Risk Assessment

According to the risk analysis chapter in PMBOK (PMI, 2017)[5], the project team members, referring to the characteristics of the project, carried out the risk tolerance of related parties on the probability of occurrence of a single potential risk, potential impact, and affected groups. Evaluate. Among them, high-level risks and catastrophe-level risks received special attention. Based on this, a risk matrix was further developed based on the probability and degree of impact of the risk. The purpose is to purposefully formulate risk response measures.

8.5 Risk Likelihood

The following list levels are based on the possibility of risk occurrence:

Rare	Possibility Description	Level
Insignificant	The chance of occurrence is almost negligible.	1
Unlikely	it will happen under rare special circumstances.	2
Possible	The probability of a certain risk occurring is a probability that cannot be ignored, although this value is not high.	3
Likely	The probability of occurrence exceeds 50%.	4
Almost Certain	It will happen almost absolutely, with extremely high probability.	5

8.6 Risk Severity

The following list levels are based on the influence when risk occurrence:

Severity	Severity Description	Level
Insignificant	very insignificant risk, almost negligible impact.	1
Minor	The impact is slight, and it can be completely resolved with very little time and passive response.	2
Moderate	The impact on the project schedule and overall budget cannot be ignored and requires proactive response.	3
Major	It will have a more serious impact, and the loss will be greater if it is not actively handled.	4
Catastrophic	Significant impact and loss caused the project to fail to proceed smoothly.	5

8.7 Risk Matrix

The following matrix is based on the product of the intersection of the likelihood of the known risk and the magnitude of the potential hazard. There are 4 levels: low risk (0-4), intermediate (5-9), high risk (10-14) and extreme (15-25).

Low		0~4	Severity				
Moderate		5~9					
High		10~14	Insignificant	Minor	Moderate	Major	Catastrophic
Extremely High		15~25	1	2	3	4	5
Likelihood	Almost Certain	5	5	10	15	20	25
	Likely	4	4	8	12	16	20
	Possible	3	3	6	9	12	15
	Unlikely	2	2	4	6	8	10
	Rare	1	1	2	3	4	5

8.8 Risk response strategy

The teammate in charge of risk has formulated effective and appropriate risk response measures for each risk obtained from the analysis, and proposed the following four strategies:

Avoidance: The project team needs to take action to eliminate the impact of the risk before it appears, in order to avoid being affected by it.

Transformation: Reasonable evasion by transferring the risk responsibility to a third party.

Mitigation: Take proactive measures to reduce the possibility of risks, or minimize negative effects.

Acceptance: adopt an attitude of accepting the existence of risks in a passive way.

(Referring to the planning risk response in PMBOK (PMI, 2017) [6].)

8.9 Risk Response Control

By implementing the risk response strategies that have been formulated, monitoring and reporting risks, initiating emergency plans and allocating emergency funds and timetables, monitoring project changes and preventing new risks, and formulating risk response control plans.

Risk Registration

Work Package ID	Risk Description	Owner	Impact	Likelihood	Severity	Risk Level	Risk Response	Mitigation	Contingency
1.1.1 1.1.2	The project proposal was rejected, the communication between the project team or the University of New South Wales was not smooth and there was even a conflict of cooperation	Project Team	Project completion delays, project quality degradation	3	2	6	Accept	The project manager harmonizes the relationship between the members and strengthens the bond; to ensure the exchange of information with UNSW lecturers.	Convene an emergency meeting and urgently change the project plan
1.2.1 1.2.2	Project requirements or project conditions have changed significantly.	Project Sponsor	Project completion delays, rising costs, increased spending, and budget re-engineering	3	3	9	Avoid	Extend special emergency funds for time buffering and start extending time buffers.	Convene an emergency meeting to urgently change the project plan
1.4.1 1.4.2 1.4.3 1.4.4 1.4.5	The source code is lost due to reasons including but not limited to human factors and environmental factors during the implementation process.	Project Team	Project completion delay	2	5	10	Transfer	Supervise developers to back up code files in time and use the code files that were backed up last time.	Retrieve or rewrite the code, adopt automatic code saving function (considering the confidentiality function)
1.4.1 1.4.2 1.4.3 1.4.4 1.4.5	Platform-based software cannot be deployed on all platforms	Project Team	Project completion delays, rising costs, increased spending, and budget re-engineering	3	4	6	Avoid	It does not adopt the idea of App design, and the use of the web-side platform has guaranteed it.	Deploy on the web side, add Responsive features

	System crashes caused by software running errors and lost unstored files at the same time.	Project Team	Project delays and impact on project quality	3	4	12	Mitigate	Extend a time buffer, re-run the software and locate the problem code for maintenance.	Code optimization to increase the software testing cycle and regular maintenance
1.4.1	Problems such as system disconnection, inability to log in, etc. caused by hardware quality problems or other reasons	Project Team	Project completion delays, rising costs, increased spending, and budget re-engineering	3	5	17	Transfer	Extend time buffer hardware maintenance	Replace new hardware and call emergency funds.
1.5.1	Lack or shortage of hardware conditions, such as insufficient storage space.	Project Team	Project completion delays, rising costs, increased spending, and budget re-engineering	2	5	10	Transfer	Extend time buffer	Report to the project sponsor
1.5.1	Hardware damage or abnormality caused by installation problems or transportation problems.	Project Team	Project completion delays, rising costs, increased spending, and budget re-engineering	2	4	8	Transfer	Extend time buffer hardware maintenance	Convene project sponsors to meet to discuss and discuss increasing the quantity and quality of hardware
	Encountered bad or extreme weather during installation.	Project Team	Project completion delays, rising costs, increased spending, and budget re-engineering	3	3	6	Accept	Extend time buffers	Convene project sponsors to meet and discuss, adjust and allocate more reasonable workload and intensity
1.5.1 1.5.2 1.5.3	Bugs found in the test such as connection problems between systems, data transmission errors, data loss, poor hardware contact, and interface display errors.	Project Team	Project completion delay	3	5	16	Mitigate	Extend time buffer to optimize software and hardware and increase test time	Convene a meeting with the project sponsors to discuss, change the software program and replace the hardware

1.6.1 1.6.2 1.6.3	Users are very unfamiliar or even unable to understand the operation of the platform.	Project Team	Project completion delays threaten the overall quality of the project	4	3	12	Accept	Reader documents are as detailed and straightforward as possible, and can achieve 100% satisfaction of checking software and user self-test.	Directly communicate with testers and regularly maintain and change platform functions to improve user experience.
1.6.3	User information leakage	Project Sponsor	Project completion delays, damage to individual reputation rights	3	4	12	Avoid	Use the Microfost login port that UNSW has always used, and stay vigilant to find similar traces	Cooperate with companies to adopt commercial-level confidentiality measures to increase the level of sensitive protection

Contingency Reserve Budget				
Activity ID	Baseline(\$)	Contingency Reserve (\$)	Overall Cost (\$)	Description
1.1.2.2	0	1500	1500	The project is delayed due to changes in requirements, or the budget needs to be increased due to the need to change and plan the project plan.
1.3.1.1	9945	2000	11945	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.1.2	7952	1750	9702	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.2.1	6909	1650	8559	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.2.2	9316	1930	11246	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.2.3	6909	1500	8409	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.4.1.1	15904	3500	19404	Due to system operation failure or loss of source code, the project may be delayed, and it takes time and money to organize manpower to recheck and rewrite.
1.4.1.2	13392	3300	16692	Due to system operation failure or loss of source code, the project may be delayed, and it takes time and money to organize manpower to recheck and rewrite.
1.4.2.1	12868	3280	16148	Due to system operation failure or loss of source code, the project may be delayed, and it takes time and money to organize manpower to recheck and rewrite.
1.4.3.1	12136	3192	15328	Due to system operation failure or loss of source code, the project may be delayed, and it takes time and money to organize manpower to recheck and rewrite.

1.4.4.1	21762	4287	26049	Due to system operation failure or loss of source code, the project may be delayed, and it takes time and money to organize manpower to recheck and rewrite.
1.4.5.2	5836	3500	9336	Due to software failures or data abnormalities, the software system needs to be changed and reorganized to test in order to solve the project as soon as possible.
1.4.6.1	1146	2050	3196	Some of the tasks were backtracked due to problems found in the code review process, which resulted in delays.
1.4.6.2	4690	2790	7480	Due to software failures or data abnormalities, the software system needs to be changed and reorganized to test in order to solve the project as soon as possible.
1.5.1	5755	4897	10652	Due to software failures or data abnormalities, the software system needs to be changed and reorganized to test in order to solve the project as soon as possible.
1.5.2	3308	2700	6008	Due to software failures or data abnormalities, the software system needs to be changed and reorganized to test in order to solve the project as soon as possible.
1.5.3	5755	3550	9305	Due to software failures or data abnormalities, the software system needs to be changed and reorganized to test in order to solve the project as soon as possible.
1.6.1.2	10135	5647	15782	Because the user is not familiar with the system interface or the user guide is not detailed enough, the user's use cost increases, and the user manual needs to be rewritten
1.6.3.2	1559	1387	2946	Due to information security issues caused by data collection or data entry, in order to resist viruses and external attacks in order to increase robustness, it is very necessary to conduct regular maintenance inspections and optimization processing of the system.
Total Contingency Reserve (\$)		54410		

Reference

- [1] Project Management Institute. (2017). A guide to the Project Management Body of Knowledge (PMBOK guide) (6th ed.). 13.1.2. Project Management Institute.
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- [6]Project Management Institute. (2017). A guide to the Project Management Body of Knowledge (PMBOK guide) (6th ed.). 11.5.2. Project Management Institute.