

Group Assignment Cover Sheet

Never Stand Still

Faculty of Engineering

School of Mechanical and Manufacturing Engineering

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- Please retain a copy of this assignment for your records.

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

Date submitted: **10/11/2021** _____

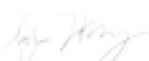


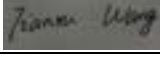
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We have retained a copy of this, our assignment, which we can provide if necessary. By signing this declaration we are agreeing to the statements and conditions above.

Team Attribution Survey and Signature Table

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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**.

Change Summary

- 21/10/2021
 - Modified the description of improper expression.
 - Added a description of project alignment with UNSW 2025 strategy
 - Added project charter.
- 01/11/2021
 - Changed some Responsibilities in Human resource Management.
 - Changed some figure in Human resource Management.
- 07/11/2021
 - Added the percentage of contingency reserve budget.
 - Adjusted the human resource and budget to shorten working period. (In task 3, we get more budget but less time to complete this project. For those budget, we choose employ more engineers to help us finish it. In task 2, we just employed 6 workers and our group team to do this project in time. And now we choose to employ 9 workers and our team to finish this project in 4 months. The project time be shorten from 162 days to 104 days and the budget also increased to \$298,966.)
- 10/11/2021
 - Optimized the risk register.
 - Adjusted the proportion of contingency reserve budget to adapt to changes in budget plan.

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1. Project Charter

Identification	
Name	UNSW Learning and Growing Platform
Description	Creates a platform for career development, study groups and guest speaker knowledge sharing to help job-seeking students in landing their dream jobs
Sponsor	Tong Ju
Project Team	Lijun Zhong, Qiyao Zhou, Rensen Zhang, Tianru Wang
Start Date	2021 Q3
End Date	2022 Q1

Purpose of Project
The purpose of the UNSW Learning and Growing Platform is to build a platform for career development, study groups and guest speaker knowledge sharing to help job-seeking students in landing their dream jobs. All products and deliverables have been defined in Chapter 3.1. This project is alignment with the UNSW 2025 Strategy.

Project Objectives
The key objective for this project is to build a platform for UNSW student career development, it will help students who struggled with job-seeking. Help current UNSW student fully prepared for the job market with develop professional skills, providing real-life working space knowledge and giving some experience in self-presenting. This project will demonstrate alignment with UNSW 2025 Strategy.

Requirements
Deliver software and hardware system including UI, database, server. Use existing services at UNSW The cost less than 350,000 including contingencies. Time less than 4 months. Demonstrate alignment with UNSW 2025 Strategy.

Project Scope
Deliver a website and an application to fulfill the purpose whose functions include career development, study groups and experience sharing about employment knowledge. Deliver end-user and admins training. See detailed scope statement in Section 2.Scope Statement.

Stakeholders
External implementation team Sponsor UNSW student development managers UNSW publicity managers

UNSW students Business enterprise

2. Scope Statement

This project is to build the UNSW Learning and Growing Platform under 350,000 AUD within 4 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.

2.1 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 to find their dream jobs to a greater extent, this project plans to build a learning platform.

2.2 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.

In addition, this project fits with UNSW 2025 Strategy, in the first place in our school under the cultivation of a batch of and a group of outstanding graduates enter the society, made huge contribution to social development, enjoy good reputation in all walks of life, to help graduates to find your dream job is the responsibility of the school, also help to continue to improve and maintain the reputation of the school. Secondly, due to the extensive and profound cooperation between the university and all walks of life, it is convenient for the project to find a third party.

2.2.1 Program

Application software installation program and software and website source code

2.2.2 Plug-ins and library files

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

2.2.3 Documents

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

2.3 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

2.4 Constraints

This project, UNSW Learning and Growing Platform, will cost no more than 350,000AUD within 4 months. The fund of project is provided by Tong Ju, who is the sponsor of this project.

2.5 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.

3.WBS

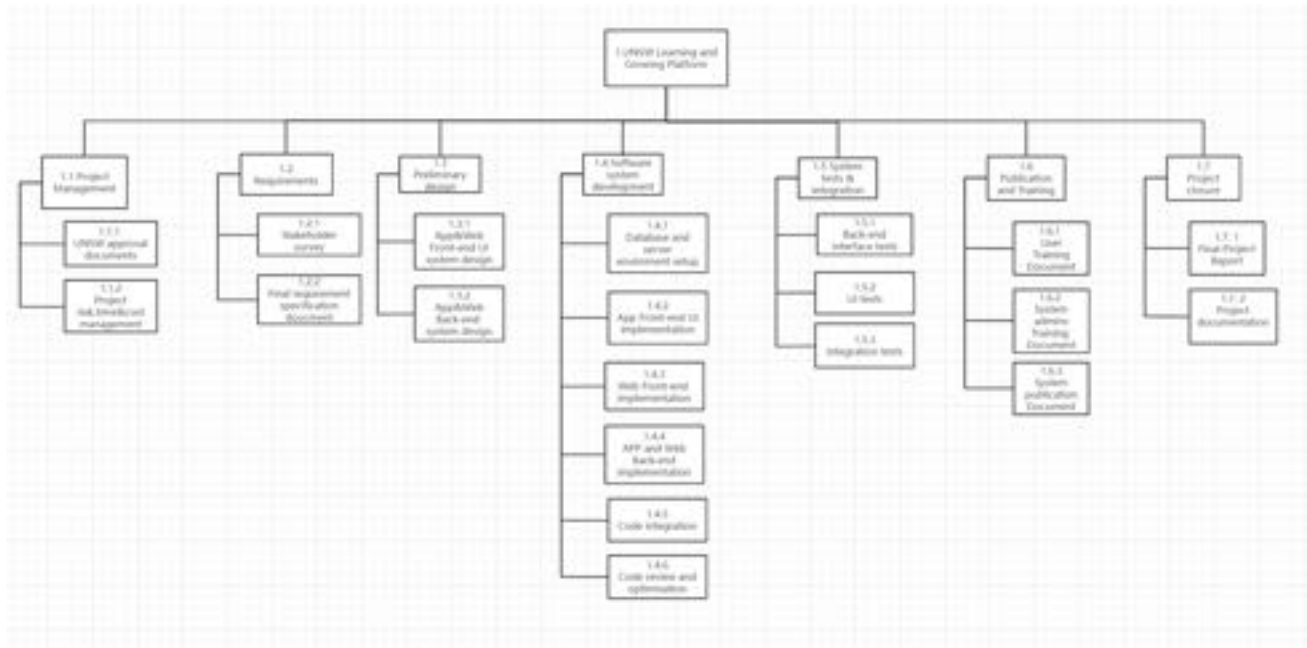


Figure 3.1 WBS

3.1 Deliverables Breakdown

Table 3.1 The Deliverables Breakdown Chart

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

4. Stakeholder Management

4.1 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.

4.2 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.

4.3 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".

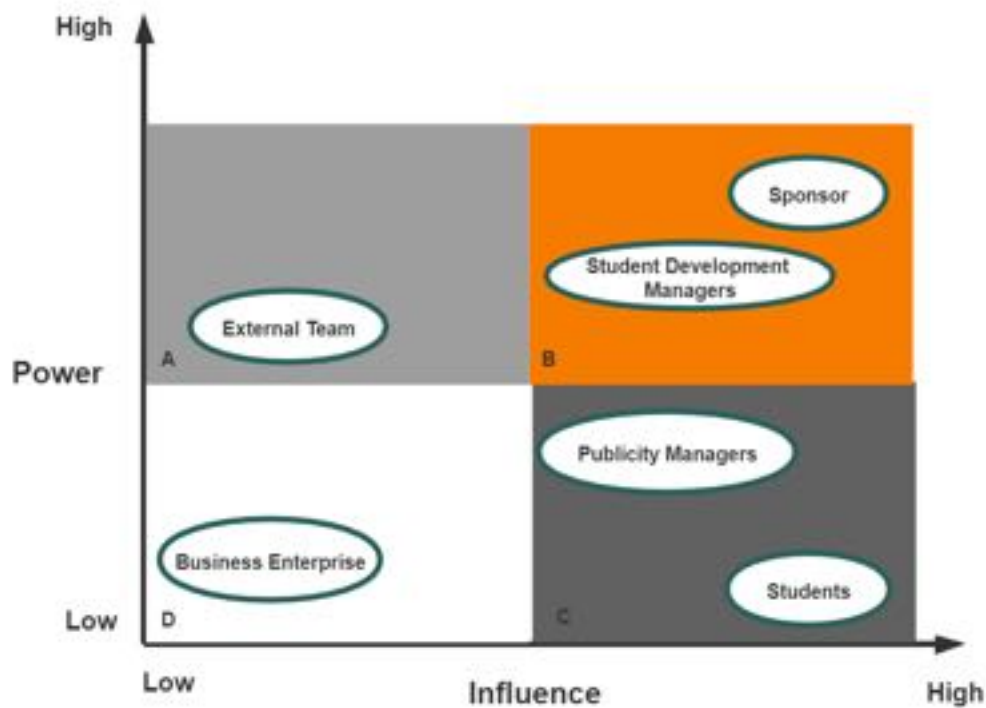


Figure 4.1 Power Influence Grid

Table 4.1 Identified Stakeholders

Category	Stakeholders	Interest
A	External implementation team	Complete the design of the platform as required to implement specific functions
B	Sponsor	Aims to obtain the required network platform through the project, and can provide constructive guidance and suggestions for the project
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

4.4 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 4.2 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.

5. Communication Plan

5.1 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.

5.2 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.
2. Understand cultural and personal differences.
3. Identify, set and manage stakeholder expectations.
4. Involve interested parties in project meetings.

Table 5.1 The Communications Plans

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

6. Cost Estimate

The management of cost and time plays an important role in a project. For this project, we estimated cost and time to make sure the project will be finished in time and within \$350,000. After the estimation, the total cost of this project should be \$298,966 excluding \$49,548 risk reserve budget. The detail of overall cost shows in Table 1. The volunteer in Table 1 means our group members, so the cost of volunteer is 0. The distribution of budget shows below. The salary of each employee get from UNSW Human Resources.

Based on the arrangement of WBS, the bottom-up approach has been chosen as the main method for estimating the cost and time. Cost of each component unit had been estimated first, and the final cost estimate has been obtained by summing up according to the work breakdown structure. By this way, we can choose and make flexible plan for some parts which acquires extra efforts. The whole schedule conflict also would be easier to solved by changing some of the less important parts.

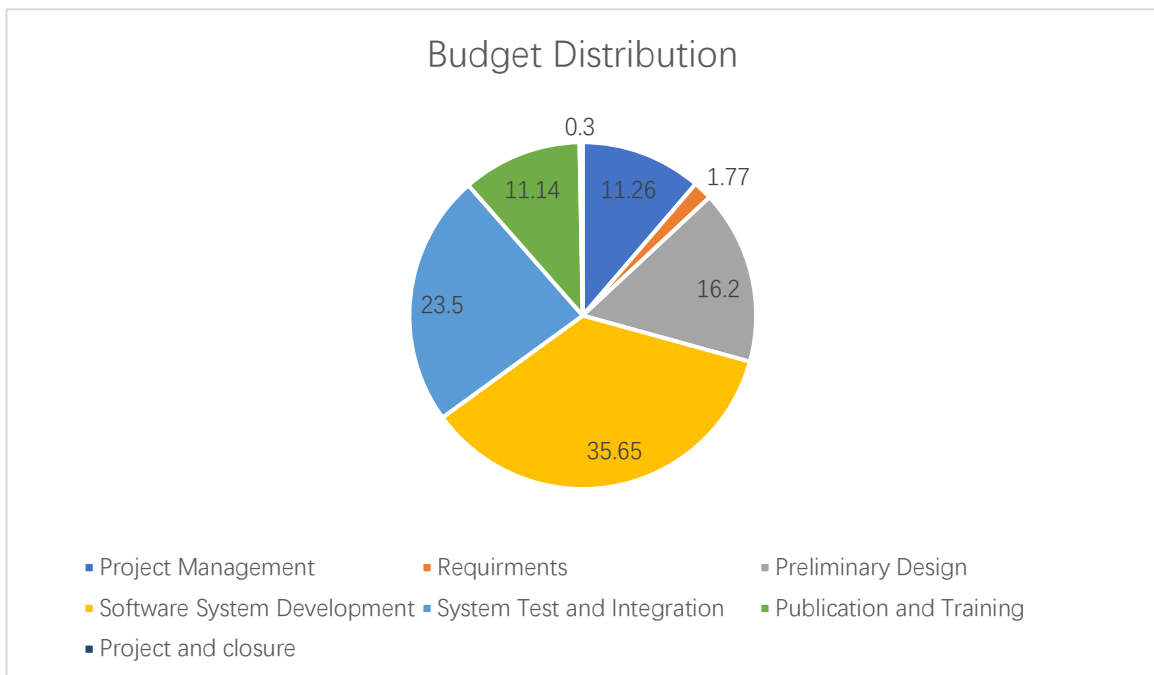
6.1 Detail of Total Cost

Following table shows the details of cost estimations.

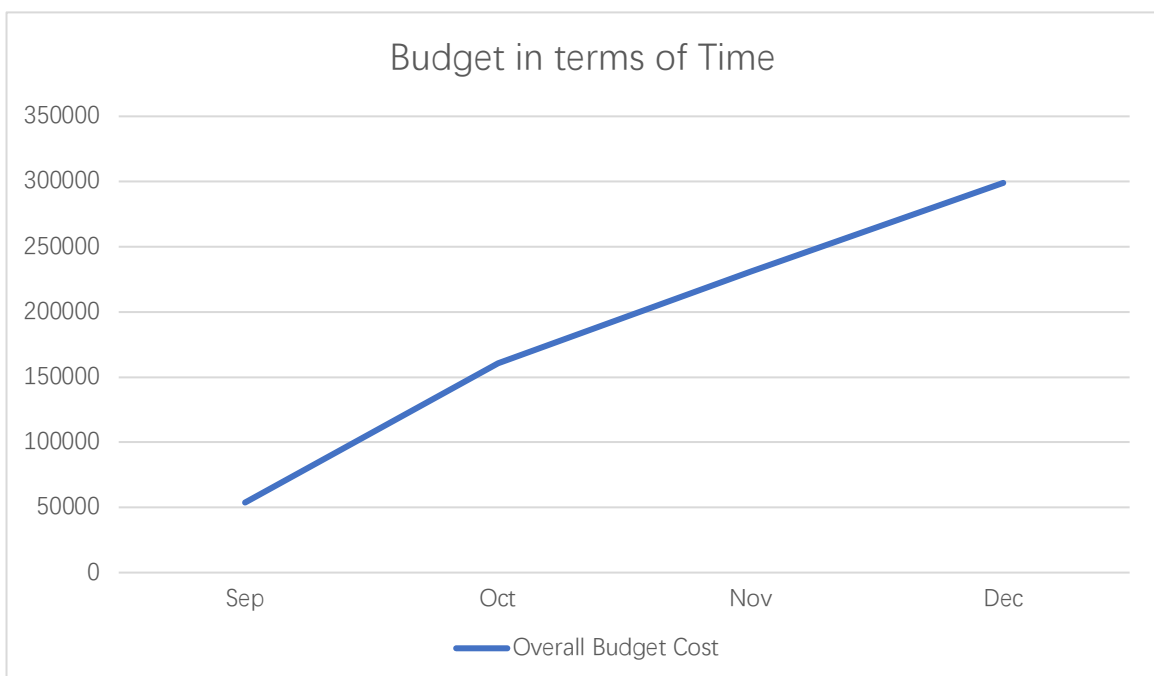
Project Management Total Cost (\$): 33660												
ID	Activity	Labour							Equipment		cost	
		Expert		Worker		Volunteer		Salary				
		Duration(h)	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost		
1.1.1.1	Project sponsor signoff	0	0	0	0	1	4	0	0	0	0	0
1.1.1.2	Project risk management	104 /days	1	0	0	0	0	7015	0	0	0	7015
1.1.2.2	project time and cost management	0	0	0	0	12	1	0	0	0	0	0
	Monitor and Control Project	0	0	0	0	832	1	26645	0	0	0	26645
Requirements Total Cost (\$): 5280												
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	20	1	20	4	1060	0	0	0	0
1.2.1.2	Make market research	0	0	50	1	50	4	2650	0	0	0	0
1.2.2.1	Make a requirement survey	0	0	8	1	8	2	424	0	0	0	0
1.2.2.2	Write final requirement specification document	8	1	0	0	0	0	1146	0	0	0	1146
Preliminary Design Total Cost (\$): 48462												
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 UI system design	0	0	100	2	0	0	9945	0	0	0	9945
1.3.1.2	Web Front-end UI system design	0	0	80	2	0	0	7952	0	0	0	7952
1.3.2.1	Back-end interface design	0	0	73	2	0	0	7641	0	0	0	7641
1.3.2.2	Back-end database design	0	0	123	2	0	0	12875	0	0	0	12875
1.3.2.3	Back-end infrastructure design	0	0	96	2	0	0	10049	0	0	0	10049
Software system development Total Cost (\$): 106599												
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	122	3	0	0	7925	0	0	0	23775
1.4.1.2	Back-end server setup	0	0	99	3	0	0	6431	0	0	0	19293
1.4.2.1	APP Front-end coding	0	0	99	3	0	0	6431	0	0	0	19293
1.4.3.1	Web Front-end coding	0	0	83	3	0	0	5391	0	0	0	16175
1.4.4.1	Back-end coding	0	0	144	3	0	0	9354	0	0	0	28063

System Test and Integration											
Total Cost (\$): 70472											
ID	Activity	Labour		Worker		Volunteer		Salary	Equipment		cost
		Expert	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.4.5.2	Front-end and Back-end Code integration	0	0	61	3	0	0	3962	0	0	11866
1.4.6.1	Code review	0	0	20	3	0	0	1299	0	0	3897
1.4.6.2	Code optimization	0	0	22	3	0	0	1429	0	0	4287
1.5.1	Back-end interface test and report	0	0	84	3	0	0	5456	0	0	16368
1.5.2	UI test and report	0	0	84	3	0	0	5456	0	0	16368
1.5.3	Front-end and Back-end Code test and report	0	0	84	3	0	0	5456	0	0	16368
1.6.1.1	Write User manual	0	0	10	2	0	0	649	0	0	1298
Publication and Training											
Total Cost (\$): 33324											
ID	Activity	Labour		Worker		Volunteer		Salary	Equipment		cost
		Expert	Number	Duration(h)	Number	Duration(h)	Number		Hardware	Cost	
1.6.1.2	User training	0	0	78	3	0	0	5067	0	0	15201
1.6.2.1	System admin manual	0	0	26	3	0	0	1689	0	0	5067
1.6.2.2	system admin training	0	0	26	3	0	0	1689	0	0	5067
1.6.3.1	System publication manual	0	0	26	3	0	0	1689	0	0	5067
1.6.3.2	system publication training	0	0	15	3	0	0	974	0	0	2922
Project Closure											
Total Cost (\$): 1169											
ID	Activity	Labour		Worker		Volunteer		Salary	Equipment		cost
		Expert	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

6.2 Budget Distribution



6.3 Budget In terms of Time



7. Schedule

Belowing shows the network diagram.

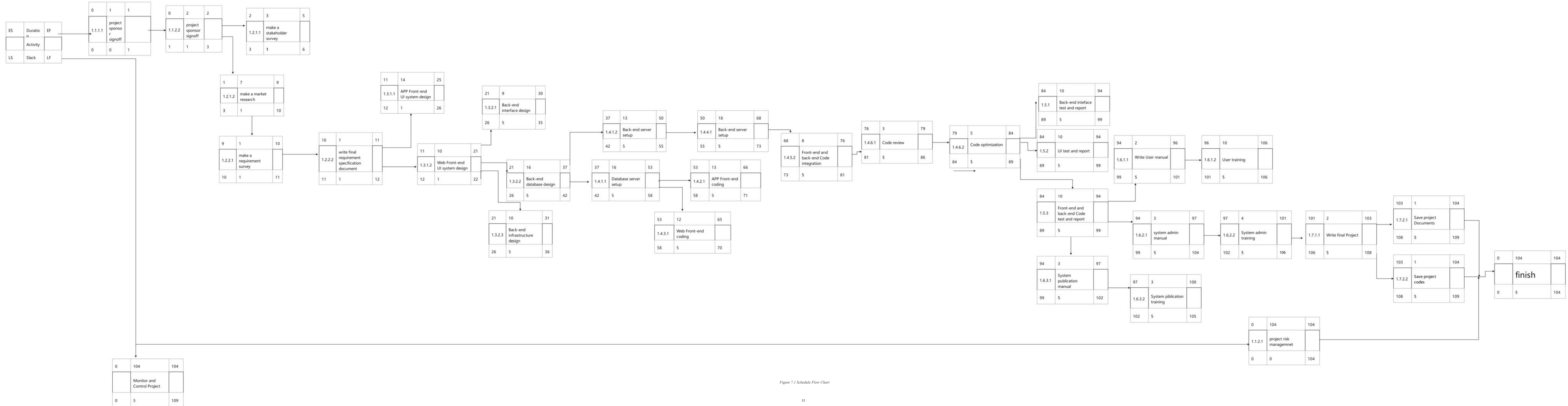


Figure 7.1 Schedule Flow Chart

Belowing shows the details of project schedule table.

Table 7.1 The Schedule Table

ID	Description	Early Start	Duration	Early End	Preceding Activity
1	Project Management	0	104	104	~
1.1.1.1	Project sponsor signoff	0	1	1	~
1.1.2.1	Project risk management	0	104	104	~
1.1.2.2	Project time and cost management	0	2	2	1.1.1.1
	Monitor and ControlProject	0	104	104	~
1.2.1.1	Make a stakeholder survey	2	3	5	1.1.2.2
1.2.1.2	Make a market survey	2	7	9	1.1.2.2
1.2.2.1	Make a requiremnet survey	9	1	10	1.2.1.2
1.2.2.2	final requirement specification doc	10	1	11	1.2.2.1
1.3.1.1	APP Front-end UI system design	11	14	25	1.2.2.2
1.3.1.2	Web Front-end UI system design	11	10	21	1.2.2.2
1.3.2.1	Back-end interface design	21	9	30	1.3.1.2
1.3.2.2	Back-end database design	21	16	37	1.3.1.2
1.3.2.3	back-end infrastructure design	21	10	31	1.3.1.2
1.4.1.1	Database server setup	37	16	53	1.3.2.2
1.4.1.2	Back-end server setup	37	13	50	1.3.2.2
1.4.2.1	APP Front-end coding	53	13	66	1.4.1.1
1.4.3.1	Web Front-end coding	53	12	65	1.4.1.1
1.4.4.1	Back-end coding	50	18	68	1.4.1.2
1.4.5.2	nt-end and back-end Code intergrat	68	8	76	1.4.4.1
1.4.6.1	Code review	76	3	79	1.4.5.2
1.4.6.2	Code optimization	79	5	84	1.4.6.1
1.5.1	Back-end interface test and report	84	10	94	1.4.6.2
1.5.2	UI test and report	84	10	94	1.4.6.2
1.5.3	t-end and back-end Code test and re	84	10	94	1.4.6.2
1.6.1.1	Write User manual	94	2	96	1.5.3
1.6.1.2	User training	96	10	106	1.6.1.1
1.6.2.1	System admin manual	94	3	97	1.5.3
1.6.2.2	system admin training	97	4	101	1.6.2.1
1.6.3.1	System publication manual	94	3	97	1.5.3
1.6.3.2	System rsblcation training	97	3	100	1.6.3.1
1.7.1.1	Write final project	101	2	103	1.6.2.2
1.7.2.1	Save project documents	103	1	104	1.7.1.1
1.7.2.2	Save project codes	103	1	104	1.7.1.1

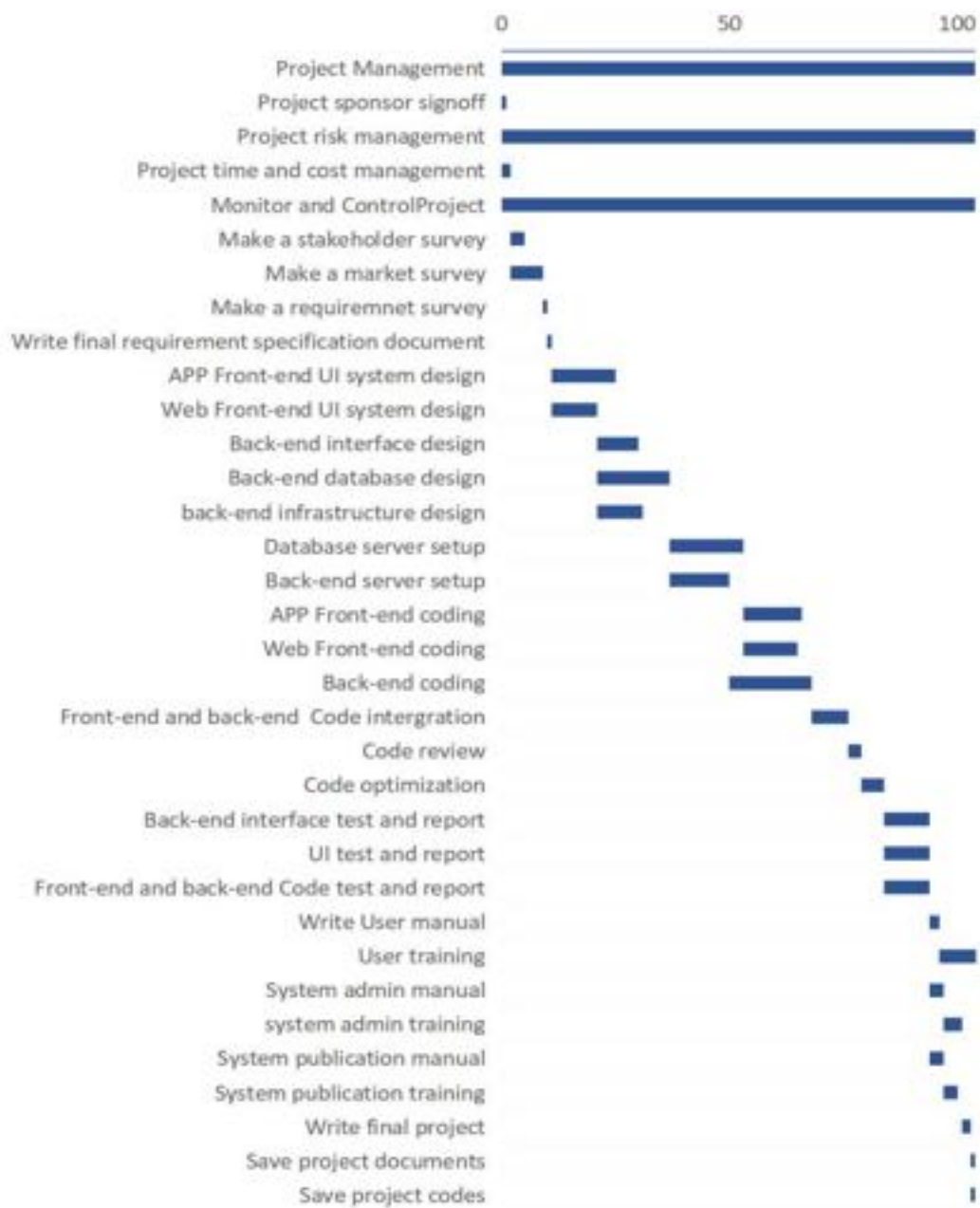


Figure 7.1 Schedule Flow Chart

8. Human Resource Plan

8.1 Overview

In this project, we will acquire 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.

8.2 Project Organization Chart

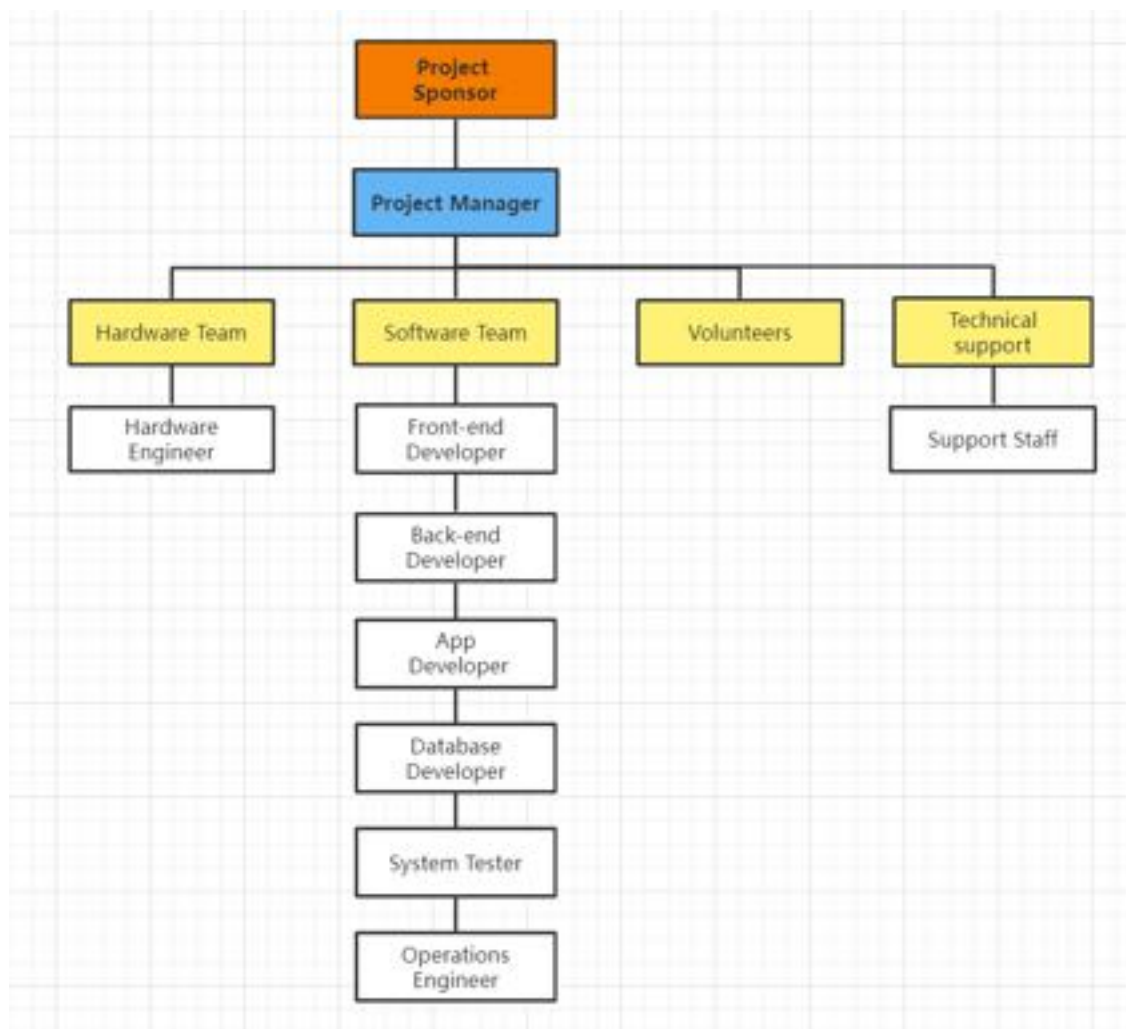


Figure 8.1 Schedule Flow Chart

8.3 Role and Responsibilities (RACI)

Table 8.1 The RACI Table

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

R=Responsible, A=Accountable, C=Consulted, I=Informed.

8.4 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, 4 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, 4 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, 4 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, 4 months, Full-Time.

Database Developer

Responsibilities: Design of system database.

Experience: 3 years of Database development experience required.

Duration: Full project, 4 months, Full-Time.

System Tester

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

Experience: 3 years of software test experience required.

Duration: Full project, 4 months, Full-Time.

Operations Engineer

Operation engineers should be software engineers first, but the responsibilities and focus are different. Operation engineers are not system administrators. The biggest difference from a system administrator is that the job of an operation engineer is not only to configure and manage the system, but also to use software development methods to enhance the function of the system or analyze data. Operation engineers should be a combination of software engineers, system engineers and other roles. Compared with general software engineers, they should have a broader knowledge background and improving the overall return on investment.

Experience: 3 years of operations experience required.

Duration: Full project, 4 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, 4 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, 4 months, Full-Time.

Volunteers

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

Experience: No experience required.

Duration: Full project, 4 months, Part-Time.

8.5 Training

There are some training programs for project staff.

Table 8.2 Training Program Table

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

9. Risk Management

9.1 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.

9.2 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, to reduce the potential impacts of any risk 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.

9.3 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 whole project, the number and level of each risk may change accordingly. Under such circumstances, formulating a plan for risk management 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.

9.4 Risk Assessment

According to the risk analysis chapter in PMBOK (PMI, 2017)[5], team members, referring to the characteristics of this 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.

9.5 Risk Likelihood

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

Table 9.1 Risk Likelihood Table

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

9.6 Risk Severity

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

Table 9.2 Risk Severity Table

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 impacts on the schedule of project 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

9.7 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).

Table 9.3 Risk Matrix Table

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	10	15	20	25
	Likely	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

9.8 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 impacts of any 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].)

9.9 Risk Response Control

Through the implementation of risk response strategies, a control plan have been formulated, including monitoring as well as reporting, initiating emergency plans and then allocating emergency funds and timetables, monitoring any changes, preventing new risks, and formulating risk response control plans.

Risk Register									
Work Package ID	Risk Description	Owner	Impact	Likelihood	Severity	Risk Level	Description of Response Strategy	Risk Response	Contingency
1.1.1 1.1.2	The project proposal get 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	The project manager harmonizes the relationship between the members and strengthens the bond; to ensure the exchange of information with UNSW lecturers.	Accept	Convene an emergency meeting to urgently change the project plan matching requirements
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	Extend special emergency funds for time buffering and start extending time buffers.	Avoid	Convene an emergency meeting to urgently change the project plan matching requirements

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	Supervise developers to back up code files in time and use the code files that were backed up last time.	Transfer	Make backups with security, at the same time retrieve or rewrite the code, you can consider the automatic code saving 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	It does not adopt the idea of App design, and the use of the web-side platform has guaranteed it.	Avoid	Timely add responsive features and deploy tests
1.4.5	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	Extend a time buffer, re-run the software and locate the problem code for maintenance.	Mitigate	Shorten the software test cycle, increase the number of test cycles and regularly maintain code optimization,
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	Extend time buffer hardware maintenance	Transfer	Activate emergency funds to purchase equipment in time

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	Extend time buffer	Transfer	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	Extend time buffer hardware maintenance	Transfer	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	Extend time buffers	Accept	Quickly organize personnel to connect to the server and restore the system to go online as soon as possible
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	Project Team	Project completion delay	3	5	16	Extend time buffer to optimize software and hardware and increase test time	Mitigate	Strengthen communication with the testing department, regularly maintain and upgrade system functions, and improve user satisfaction.

	hardware contact, and interface display errors.								
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	Reader documents are as detailed and straightforward as possible, and can achieve 100% satisfaction of checking software and user self-test.	Accept	Strengthen communication with the testing department, regularly maintain and upgrade system functions, and improve user satisfaction.
1.6.3	User information leakage	Project Sponsor	Project completion delays, damage to individual reputation rights	3	4	12	Use the Microfost login port that UNSW has always used, and stay vigilant to find similar traces	Avoid	Cooperate with intern companies to adopt commercial-level confidentiality measures to improve the protection level of sensitive information

Table 9.4 Risk Register Table

Table 9.5 Contingency Reserve Budget Table

Contingency Reserve Budget					
Activity ID	Baseline(\$)	Contingency Reserve (\$)	Proportion (%)	Overall Cost (\$)	Description
1.1.2.2	0	1200	2.4%	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	1492	3.0%	11437	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.1.2	7952	1193	2.4%	9145	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.2.1	6909	1146	2.3%	8787	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.2.2	9316	1931	3.9%	14806	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.3.2.3	6909	1507	3.0%	11556	Due to changes in requirements, projects may be delayed since the design needs to be modified.
1.4.1.1	15904	5944	12.0%	29719	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	4823	9.7%	24116	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	4823	9.7%	24116	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	4044	8.2%	20219	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	7016	14.2%	35079	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	2972	6.0%	14858	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	974	2.0%	4871	Some of the tasks were backtracked due to problems found in the code review process, which resulted in delays.
1.4.6.2	4690	1072	2.2%	5359	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	2292	4.6%	18660	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	2292	4.6%	18660	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	2292	4.6%	18660	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	2128	4.3%	17329	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	409	0.8%	3331	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 (\$)		49548			

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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