

## 1. Project Initiation

This is the first step of the project. There are two main processes in the first phase which include: i) Create the Project Charter and ii) Identify the Project Stakeholder [1].

### 1.1 Create the project charter

Project charter is the process of developing a document that formally authorizes a project and documenting initial requirements that satisfy the stakeholders needs and expectations. Project charter is shown in the below table:

#### Project charter

**Project title:** Mobile App for School of Maths

**Start date:** 15 November 2022

**Finish date:** 15 March 2023

**Budget information:** The budget is 5,000.00 USD. The project is fully funded by School of Maths, represented by Ms. Khy Srey Sros.

**Project manager:** Mr. Touch Sopheak, (+855) 89987900, touchsopheak@yahoo.com

**Project objectives:** To build a mobile app for School of Maths

**Approach:**

- Schedule data collection at School of Math
- Assign the channel to communicate well with all stakeholders.
- Define clear requirements with the client.

**Roles and Responsibilities:**

Role	Name	Organization/Position	Contact information
PM	Mr. Touch Sopheak	Project manager	+855 89987900
Developer	Mr. Pen Chentra	Developer	+855 12252525
User, Tester	Ms. Chheang Sreypich	Tester	+855 10452654

**Contract:**

- Progress meeting every Monday at Data Solution meeting room from 9am.
- Meeting with the client every month on the 15<sup>th</sup>
- The major channel for communication is telegram group

### 1.2 Identify the project stakeholder

This is the process to identifying all people or organizations impacted by the project and documenting relevant information regarding their interests, involvement and impact on project success. **Outputs:** Stakeholder register, Stakeholder management strategy. For this particular project, the stakeholder register and stakeholder management strategy are shown in table 1 and table 2 below.

### Stakeholder register

Name	Organization/Position	Internal/External	Project Role	Contact information
Ms. Khy Srey Sros	CEO of School of Maths	Internal	Client	+855 11757475
Mr. Touch Sopheak	Project Manager of Data Solution	Internal	Project manager	+855 89987900
Mr. Pen Chentra	Developer of Data Solution	Internal	Developer	+855 12252525
Ms. Chheang Sreypich	Tester of Data Solution	Internal	Tester	+855 10452654
All teachers at School of Maths	Teachers	External	Users	
All parents of students studying at School of Maths	Parents	External	Users	
All students studying at Shool of Maths	Students	External	Users	

Table 1. Stakeholder register

### Stakeholder management strategy

Name	Level of Interest	Level of Influence	Potential Management Strategies
Ms. Khy Srey Sros	High	High	She is the client of this project. She has short time for meetings, focuses on results and financial benefits.
Parents of student	Low	Hight	Parents may not interest in this project, but they are likely to high influence on this project as they are the clients of School of Maths.

### Sign off the project

Name	Internal/External	Project Role	Contact information	Signature
Ms. Khy Srey Sros	Internal	Client	+855 11757475	
Mr. Touch Sopheak	Internal	Project manager	+855 89987900	
Mr. Pen Chentra	Internal	Developer	+855 12252525	

Ms. Chheang Sreypich	Internal	Tester	+855 10452654	
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## 2. Project Planning

With the respect to the School of Maths' mobile app, the project planning processes required to establish the scope of the project, refine the objectives and define the course of action required to attain the objectives of the project.

### 2.1 Develop Project Management Plan (Integration):

Process of documenting is necessary to define, prepare, integrate and coordinate all subsidiary plans. In other world, this process is about creating the project management plan.

**Outputs:** Project Management plan. With the project management plan, our project team will use Microsoft office such as word and excel to plan the project. Moreover, we look forward to use Microsoft project in the next project due to lack of experience in Microsoft project. The Project Management Plan is shown below:

#### Mobile App for School of Maths

##### Introduction:

This project is to build **School of Maths** a mobile app that will be used as communication platform between the school admin, teachers, parents and students. This project will make a great benefit to **School of Maths** if it succeeds.

##### Objectives:

The objectives of this project are:

- To build a mobile app that can transfer paper works to this app
- To connect parents/students/teachers with the school
- To make it easy for the school to extend

##### Scope:

Build **School of Maths** an app that can be both used by Android and IOS.

##### Key Stakeholders:

Client	School of Maths, represented by Mrs. Khy Srey Sros
Contractor	Data Solution, represented by Mr. Touch Sopheak

##### Resources and Tools:

- Native mobile app development tools
  - Xcode

- Android Studio
- AppCode
- Cross-platform mobile app development tools
  - Appcelerator
  - Xamarin
  - Adobe PhoneGap
  - Ionic
  - React Native
  - MobiLoud
  - Ninox
  - Sencha
  - NativeScript
  - Onsen UI
  - OutSystems
  - Fliplet
  - TrackVIA
  - AppSheet
  - Quick Base
  - Alpha anywhere
  - BuildFire

**Milestone list:**

First, for client meeting/update, our team have to send the update to the project client every month. In addition, for progress meeting, we use waterfall software developing life cycle having one per week the project progress meeting on every Monday morning. For other tasks will be shown in the table of milestone list below:

Milestone	Description	Date
Complete Requirement Gathering	All requirements for mobile app must be determined to mobile app-based architecture design upon	15/12/2022
Complete mobile app architecture design	All database, back-end and dataflow will be design	31/12/2022
Complete UI Design	The UI is design for normal user easy to understand and use.	31/01/2023
Complete transaction Design	All the transaction of mobile will be discussed and designed to one agreement.	15/02/2023
Complete Coding	All coding is finished	25/02/2023

Complete Testing	Use test case to test all the transaction of website	01/03/2023
Complete implementation	The rest of the time is to implement with SEO update and applying	12/03/2023
Closing the project	All processes are done to close the project.	15/03/2023

Approval Signature



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Mrs. Khy Srey Sros  
Director of School of Maths



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Mr. Touch Sopheak  
CEO of Data Solution

#### Scope Requirement:

For scope requirement to me, I think it is not necessary to make it because it is already specified from the client already.

#### 2.2 Collect requirements (Scope):

With the respect to this mobile project, the process of collecting requirements the process of defining and documenting stakeholders' needs to meet the project objectives. And the output of this process contains 2 document types which include: requirements documentation and requirements traceability matrix. The below description shows the detail of Requirement Specification which include requirements documentation and requirements traceability matrix:

#### Requirement Specification

##### Review by:

Project Manager: Touch Sopheak

Version: 1.0

Dated: 15 November 2022

#### Requirement Specification

##### Document Change Record

The table below shows the Project Change Update in version 1.0

Date	Version	Author	Change Description
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20/11/2022	1.0	All	Create Requirement Specification document
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#### **Document Review:**

The following table identifies all management authorities who have successively approved the present issue of this document.

No	Reviewer	Position	Sent	Returned
1	Mrs. Khy Srey Sros	Project Client	15-11-2022	22-11-2022

### **i. Introduction**

This project is to build School of Maths a mobile app. This app will be used as the communication platform between the school, parents, students and lecturers.

### **ii. The Stakeholders**

- Sponsor
- Users
- Technology experts
- System architect
- Maintainers
- Support
- Current system specialists / Administer
- Project manager
- Business leaders
- Business analysts
- Designers
- Programmers
- Testers

### **iii. Use case for shared calendar**

#### **Functional Properties:**

- F1. The user must login or register.
- F2. The user can connect gmail or facebook.
- F3. User have to pay for some value document or course
- F4. User can get certificate after finishing a short course
- F5. The user can get links, videos, and e-books.
- F6. The user can read online for links, videos, and e-books

F7. The user can search by title, author name, and keywords

F8. The user can search by date, rank and other.

F9. The user can preview links, videos, and e-books

F10. The user can share material on facebook

F11. The user can vote the rate on links, videos, and e-books

F12. The user can see notification for material update

F13. After finish

F14. The administrator manage user

F15. The administrator upload material

#### **iv. Requirements Description**

School of Maths mobile app will be exclusively used by School of Maths admin and provide access to teacher, parents and students. Admin can manage all aspect of the app.

##### **iv.1 Functionality Requirements**

###### **UsrReq001**

1. The product shall retrieve e-books, videos and links from data source and show sort the files by date, by alphabet of the name file, by popularity or by content.

###### **UsrReq002**

2. The product shall mange client by check username and password.

###### **UsrReq003**

3. The product shall support .pdf file types.

###### **UsrReq004**

4. The product shall have update files.

###### **UsrReq005**

5. The product shall have the preview feature before the user download the file. By reviewing the file, the users will not need to download the file if the information in the file is not useful to time.

###### **UsrReq006**

6. Search function is important for libraries. If the search function has high capability, it can satisfy the users. Good indexing means that when a user search by a keyword, not only the

search function reads the tiles or headlines of the file but also it is necessary to look the text inside the documents.

#### **UsrReq007**

7. The product shall provide the popular files (Ranking) up-to-date so that users can know the trend and get up-to-date knowledge.

#### **UsrReq008**

8. The product shall have social sharing feature so that the members of the library can show the interesting files, videos and news of the library to their co-workers, friends and their society. Every time the files are shared, information about the library and the mission can lead to increasing awareness. Twitter and Facebook are popular social media for sharing information of libraries.

#### **UsrReq009**

9. The product shall have a popular online community platform that let the members of library to get access the files from one central location.

#### **UsrReq010**

10. The product shall have notifications and alerts to users when there is update in the library. Sometimes, when the user search something but it is not on the library. So, the library asks the users to send notification when the file is available on the library. Some libraries have this feature.

#### **UsrReq011**

11. The User have to pay for short course of MIS course, then after finish the certificate will be provided.

### **iv.2 Non-Functionality Requirements**

#### **iv.2.1 Performance Requirements**

##### **NFRsReq001**

1. Any interface between a user and the automated system shall have a maximum response time of 5 seconds.

##### **NFRsReq002**

2. The product shall download the real data within 5 minutes of a change.

##### **NFRsReq003**



3. The product shall cater for 10,000 simultaneous users and maximum loading at other periods will be 6,000 simultaneous users.

#### **iv.2.2 Reliability and Availability Requirements**

##### **NFRsReq004**

4. The product shall be available for use 24 hours per day, 365 days per year.

#### **iv.2.3 Security Requirements**

##### **NFRsReq005**

5. The product shall provide 10 minutes of emergency operation should it become disconnected from the source or the product shall protect itself from intentional abuse.

##### **NFRsReq006**

6. Only administrator can see the personnel records of their user.

##### **NFRsReq007**

7. The security settings depend on the founders of library. Some files can be accessed only by the members of the libraries.

##### **NFRsReq008**

8. The product shall protect private information in accordance with the relevant privacy laws and the organization's information policy.

##### **NFRsReq009**

9. Personal information shall be implemented so as to comply with the Data Protection Act.

#### **3.2.3 Usability Requirements**

##### **NFRsReq010**

10. The product shall be easy for bachelor's student to use.

##### **NFRsReq011**

11. The product shall be used by people with no training, and possibly no understanding of English.

##### **NFRsReq012**

12. The product shall be able to be used by members who will not receive training before using it.

##### **NFRsReq013**

13. The product shall use symbols and words that are naturally understandable by the user community.

#### **NFRsReq014**

14. The product shall hide the details of its construction from the user or the product shall be usable by partially sighted users.

### **3.2.4 Look and Feel Requirements**

#### **NFRsReq015**

15. The product shall comply with the Window and Smart phone guideline.

#### **NFRsReq016**

16. The product shall appear simple to use.

#### **NFRsReq017**

17. The product shall have the white-gray theme and the style is neat and tidy.

### **iv.3 Mandated Constraints**

1. The product shall connect to the Internet.
2. The product shall operate using Windows and Mac OS (Web Application).
3. The product shall operate using Smart phone android and IOS.

**Requirement Traceability Matrix**

Requirement No.	Name	Category	Source	Status
R1	Laptop	Hardware	Project Charter and cooperate laptop specification	Complete, laptop order meets the requirement
R2	Keyboard	Hardware	Project Charter and cooperate laptop specification.	Complete, Keyboard order meets the requirement.
R3	Monitor	Hardware	Project Charter and cooperate laptop specification.	Not complete, Monitor order does not meet the requirement.

Approval Signature



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Mrs. Khy Srey Sros  
Director of School of Maths



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Mr. Touch Sopheak  
CEO of Data Solution

### 2.3 Define scope (Scope):

In the planning step, the defining scope process is another process of developing a detailed description of the project and product. With the respect to the PCC project the output of this prefers to be Project Scope Statement and Project Document Update. These two documentations will show the detail of project and product: **(Outputs:** Project scope statement, project document updates)

#### Mobile App for School of Maths Project Scope Statement

**Project Name:** Mobile App for School of Maths

**Team Member:** Mr. Pen Chentra, Ms. Chheang Sreypich

**Project Manager:** Mr. Touch Sopheak

**Date:** Monday, 15/12/2022

**Prepared by:**

Document Owner	Project/Organization Role
Mr. Touch Sopheak	Project Manager

#### Project Closure Report Version Control

Version	Date	Author	Change Description
1	15/11/2022	Mr. Touch Sopheak	Create document...
2	30/12/2022	Mr. Pen Chentra	Update document...
3			Revise document...

Table 3: Project Document Updates

## 2.4 Create WBS (Scope):

The creation of work breakdown structure (WBS) is another process in project planning which in this project is a process of subdividing project deliverables and project work into smaller, more manageable components. Generally, the **Outputs of this process include:** WBS, WBS dictionary, scope baseline, project document updates. The detail below will show the format and detail of WBS, WBS Dictionary, Scope Baseline, and Project Document Update with respect to the current project.

### Work Breakdown Structure

With the work breakdown structure, we prefer to use the tabular view of WBS which is shown below:

Level 1	Level 2	Level 3
School of Maths mobile app	1.1 Initiation	1.1.1 Evaluation & Recommendations 1.1.2 Develop Project Charter 1.1.3 Deliverable: Submit Project Charter 1.1.4 Project Sponsor Reviews Project Charter 1.1.5 Project Charter Signed/Approved
	1.2 Planning	1.2.1 Create Preliminary Scope Statement 1.2.2 Determine Project Team 1.2.3 Project Team Kickoff Meeting 1.2.4 Develop Project Plan 1.2.5 Submit Project Plan 1.2.6 Milestone: Project Plan Approval
	1.3 Execution	1.3.1 Project Kickoff Meeting 1.3.2 Verify & Validate User Requirements 1.3.3 Design System 1.3.4 Procure Hardware/Software 1.3.5 Install Development System 1.3.6 Upload MIS resource to system 1.3.7 Testing Phase 1.3.8 User Training
	1.4 Control	1.4.1 Project Management 1.4.2 Project Status Meetings 1.4.3 Risk Management 1.4.4 Update Project Management Plan
	1.5 Closing	1.5.1 Audit Procurement 1.5.2 Document Lessons Learned 1.5.3 Update Files/Records 1.5.4 Gain Formal Acceptance 1.5.5 Archive Files/Documents

Table 4: WBS of School of Maths mobile app

## WBS Dictionary

**Project Title:** School of Maths Mobile App    **Data Prepared:** 15/12/2022

<b>Work Package Name:</b> Testing				<b>WBS ID:</b> 1.3.7					
Description of Work: There will be accessibility testing for the website. There will be testing to make sure all transaction of website work correctly. There will be testing all the resource of MIS which will be available on the system.									
<b>Milestones:</b> 1. Website feature testing complete 2. Integration testing complete 3. Resource accessibility testing complete				<b>Due Date:</b> 15/01/2023 15/02/2023 01/03/2023					
ID	Activity	Resource	Labor			Material			Total cost
			Hours	Rate (USD)	Total	Unit	Cost	Total	
1.3.7.1	Website testing	PM	5	10	50				50
1.3.7.2	Hyperlink Testing	PM	5	10	50				50
1.3.7.3	MIS resource accessibility testing	PM	50	10	500				500
1.3.7.4	Integration testing	PM	5	10	50				50
<b>Quality Requirement:</b> Website must be have registration form and can accessible for all MIS resource.									
<b>Acceptance Criteria:</b> Website must be accessible for each registration user to take short taining course on MIS.									
<b>Technical Information:</b> After training course, the certificate will be provided.									
<b>Contract Information:</b> Testing will be conducted by the Project manager in charge of the area to be tested.									

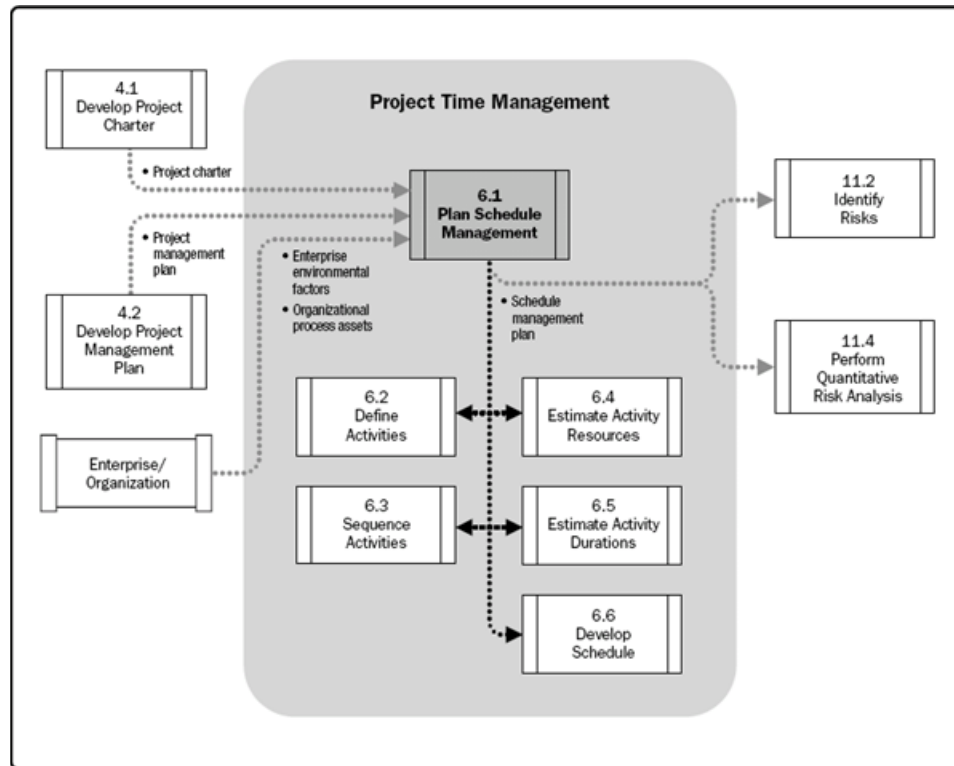
Table 5. An example of WBS Dictionary in testing phase

For **Scope Baseline**, require 3 documentations which is included: Scope Statement, WBS and WBS dictionary. All these 3 documentations have done already with tables above. The purpose of scope baseline is outlining the requirement for the scope of project and the work will be broken down.

On the other hand, **Project Document Update**, is the combination of all work to be updated.

### 2.5 Plan Schedule Management:

In plan schedule management, it is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. The key benefit of this process is that it provides guidance and direction on how the project schedule will be managed throughout the project. The figure below shows the example of PCC plan schedule management: (Output: PCC Plan Schedule Management)



**Figure 1: Plan Schedule Management data flow diagram of PCC**

## 2.6 Define activities (Time):

In this process, the defining activities of project has been offered. It is a process of identifying the specific actions to be performed to produce the project deliverables.

Outputs: Activity list, activity attributes, milestone list.

### Activity List of School of Maths Mobile App Project

Activity	Activity Description	Immediate Predecessors	Estimate Duration
A	Finding MIS Resource	-	Update very time
B	Buy google's Domain	A	1 week
C	Backend (database design)	B	2 weeks
D	UI design	C	4 weeks
E	Install atom and coding	D	8 weeks
F	Set SEO	E,F	4 weeks

Table 6: Activity List of School of Maths Mobile App Project

### Activity Attribute of School of Maths Mobile App Project

**Project Title:** School of Maths Mobile App **Date Prepared:** 15/11/2022

DC: C			Activity: Backend (database design)		
Description of Work: The database design activity is an activity which has many process, it is included data flow design, UML design ,etc.					
Predecessors	Relationship	Lead of Lag	Success or	Relationship	Lead or Lag
B	Start-to-Finish	Lead	D	Sart-to-Start	Lag
Number and Type of Resource require: 2 people		Skill Requirement: Coding, Business Analysis and System Analysis			Other Requirement resource: --
Type of Effort:					
Location of Performance:					
Imposed Dates or Other Constraints:					
Assumption:					

**Table 7: Activity Attribute of School of Math Project**

Milestone List of Schol of Maths Project				
Project: School of Maths Mobile App			Date: 15/11/2022	
Milestone No.	Milestone	Mandatory/Optional	Completion Date	Verification
001	Project start	Mandatory	15-11-22	Client Approval
002	Complete Gathering Requirements	Mandatory	15-12-22	Client Approval
003	Complete Design	Mandatory	15-01-23	Client Approval
004	Complete Coding	Mandatory	01-02-23	Client Approval
005	Complete Testing	Mandatory	15-02-23	Client Approval
006	Complete Implementation	Mandatory	01-03-23	Client Approval
007	Project End	Mandatory	15-03-22	Client Approval

**Table 8: Milestone List of School of Maths Project**

The sponsor approves in this case refer to all document and tasks have been finished, so the sponsor can read and understand then need to be approve.

### **2.7 Sequence activities (Time):**

In the sequence activities process, the order of activity in the project will be discussed. With the respect to PCC project, sequence activities process is a kind of process which identifying and documenting relationships among the project activities. The Outputs: Project schedule network diagram, project document updates:

#### **Project schedule network diagram**

A project network is a graph (flow chart) depicting the sequence in which a project's terminal elements are to be completed by showing terminal elements and their



dependencies. It is always drawn from left to right to reflect project chronology. Due to drawing the project network diagram is quite difficult with some software so the PM is decided to make it via Microsoft word to be as the schedule allocation.

Task/month	2022		2023		
	Nov	Dec	Jan	Feb	Mar
<u>INITIATION</u> 1. Kick off meeting 2. Create Project charter					
<u>PLANNING</u> 1. Identify, discuss, and prioritize risks 2. Create draft Gantt chart 3. Review and finalize Gantt chart 4. Prepare schedule and cost baseline 5. Prepare WBS 6. REQ Gathering 7. Create Prototype 8. Chreat SRS 9. Design UI 10. Design Database 11. Design Architecture					
<u>EXECUTING</u> 1. Create Test case 2. Coding and Debug 3. User's manual 4. Create test plan 5. UAT Document 6. Installation 7. User Training					
<u>MONITORING AND CONTROLLING</u> 1. Progress Meeting					
<u>PROJECT CLOSER</u> 1. UAT 2. Closer Meeting					

**Figure 2: Schedule Allocation**

After the project schedule network diagram is finished, some documents will update. Thus, it will case to make a new documentation which call Project Document Updates. In this case the document version control is being discus, document version control refers to a

method for controlling and reporting on all versions and revisions of documents is implemented and operating.

## 2.8 Estimate activity resources (Time):

Estimating activity resources is a process of estimating the type and quantities of material, people, equipment, or supplies required to perform each activity. The Outputs of this process include: Activity resource requirements, resource breakdown structure, and project document updates.

### Activity Resource Requirements

Project Title: School of Maths Mobile App

Date Prepared: 15/12/2022

WBS ID	Type of Resource	Quantity	Assumptions
<b>1.1 Initiation</b>			
1.1.1	Evaluation & Recommendations	1	People
1.1.2	Develop Project Charter	2	People
1.1.3	Devdeliverable: Submit Project Charter	3	People
1.1.4	Project Sponsor Reviews Project Charter	3	People
1.1.5	Project Charter Signed/Approved	2	People

Table 9: Example of Activity Resource Requirement of School of Maths Project

### Resource Breakdown Structure

Project Name	School of Maths Mobile App	Date	15-11-22
Project Number	01	Document Number	04
Project Manager	Touch Sopheak	Project Owner/Client	Khy Srey Sros

RBS Code/ID				Resource Categories and Types	Quantity	Notes
R1				Project	8	
	R1.1			Labor	1	
		R1.1.1		Project Management	2	
			R1.1.1.1	Project Manager	1	
			R1.1.1.2	Assistant Project Manager	1	
		R1.1.2		Software Development	6	
			R1.1.2.1	Solutions Architect	1	
			R1.1.2.2	Development Lead	1	
			R1.1.2.3	Developer	1	
			R1.1.2.4	Developer	1	
			R1.1.2.5	Tester	1	
			R1.1.2.6	Trainer	1	
	R1.2			Equipment	8	
		R1.2.1		Hardare	2	
			R1.2.1.1	Laptop	2	
			R1.2.1.2	Laptop	2	
			R1.2.1.3	Projector	1	
			R1.2.1.4	Printer	1	
		R1.2.2		Software Development	3	
			R1.2.2.1	Visio	1	
			R1.2.2.2	Atom	2	
	R1.3			Supplies	5	
			R1.3.1	Ink	1	
			R1.3.2	Paper	1	
			R1.3.3	Binders	3	
	R1.4			Locations		
			R1.4.1	School of Maths		

Table 10. Resource Breakdown Structure of MIS short training course of PCC project.

The last documentation of this process is project document updates, which combine all files updated from activity resource requirement and resource breakdown structure.

## 2.9 Estimate activity duration (Time):

The process of estimate activity duration is a process of approximating the number of work periods needed to complete individual activities with estimated resources. Outputs of this process are: Activity duration estimates and project document updates.

### Activity Duration Estimates

Project Name	School of Maths Mobile App	Date	15-11-22
Project Number	01	Document Number	05
Project Manager	Touch Sopheak	Project Owner/Client	Khy Srey Sros

WBS ID#	Activity	Human Resources	Effort in Number of Hours	Duration Estimate	Level of Confidence	Additional Information
1.1.1	Evaluation and Recommendations	1	10	2 days	High	
1.1.2	Develop Project Charter	1	10	2 days	Medium	
1.1.3	Deliverable: Submit Project Charter	1	20	1 week	High	
1.1.4	Project Sponsor Reviews Project Charter	1	10	2 days	High	
1.1.5	Project Charter Signed/Approved	1	2	1 day	High	

**Table 11: Initiation Activity Duration Estimate of School of Maths Project**

The table 11 above is just an example of one main activity (project initiation), which in one project there are many activities. With the respect to PCC training MIS short course, the project document updates will be updated after the activity duration estimates is finished.

#### 2.10 Develop Schedule (Time):

In this process, Develop Schedule will be analyst activity sequences, durations, resource requirements and schedule constraints to create the project schedule. The Outputs include: Project schedule, schedule baseline, schedule data, project document updates:

### Project Schedule of School of Maths Project

<b>2.0 Design phase</b>					
<b>2.1 Preliminary Design</b>					
<b>2.2 DB Design</b>					
<b>2.3 Data Flow Design</b>					
<b>Detail Design</b>					
<b>Document Design</b>					

**Table 12: Example of Design Activity for Project Schedule in PPC MIS training**

**Schedule Baseline**

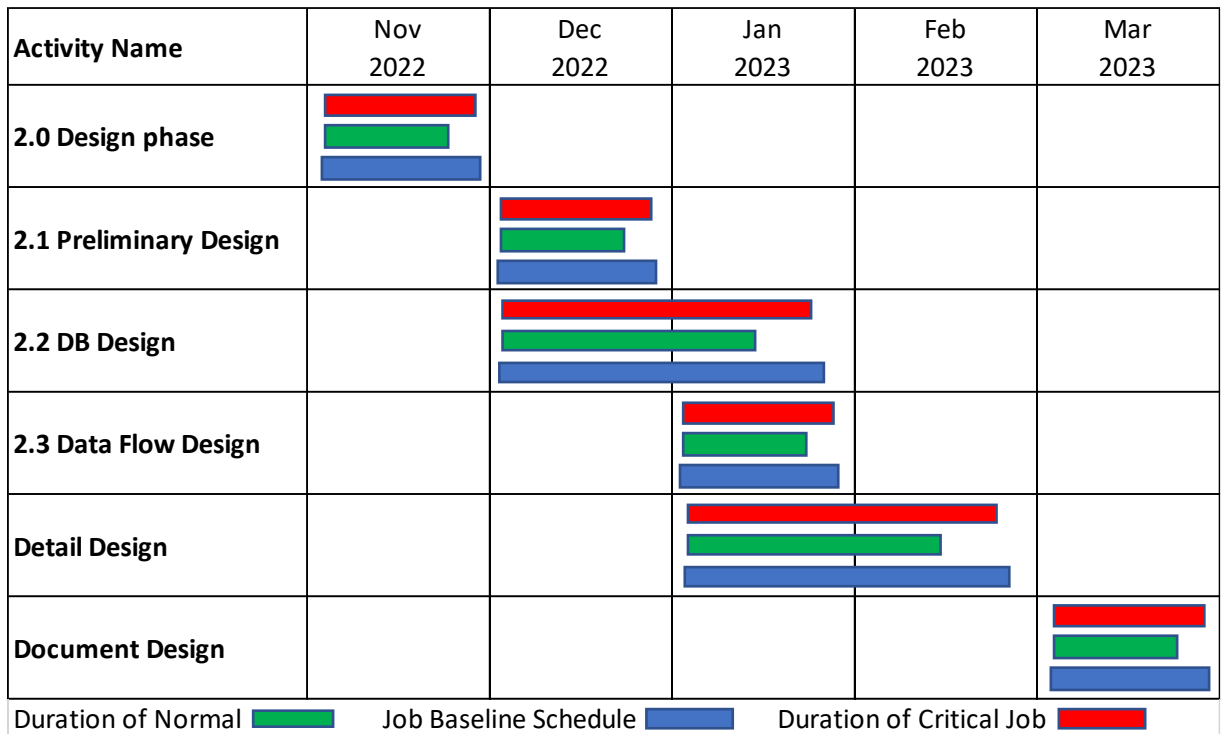


Table 13: Schedule Baseline of Design Activity for School of Maths Project

**Schedule Data**

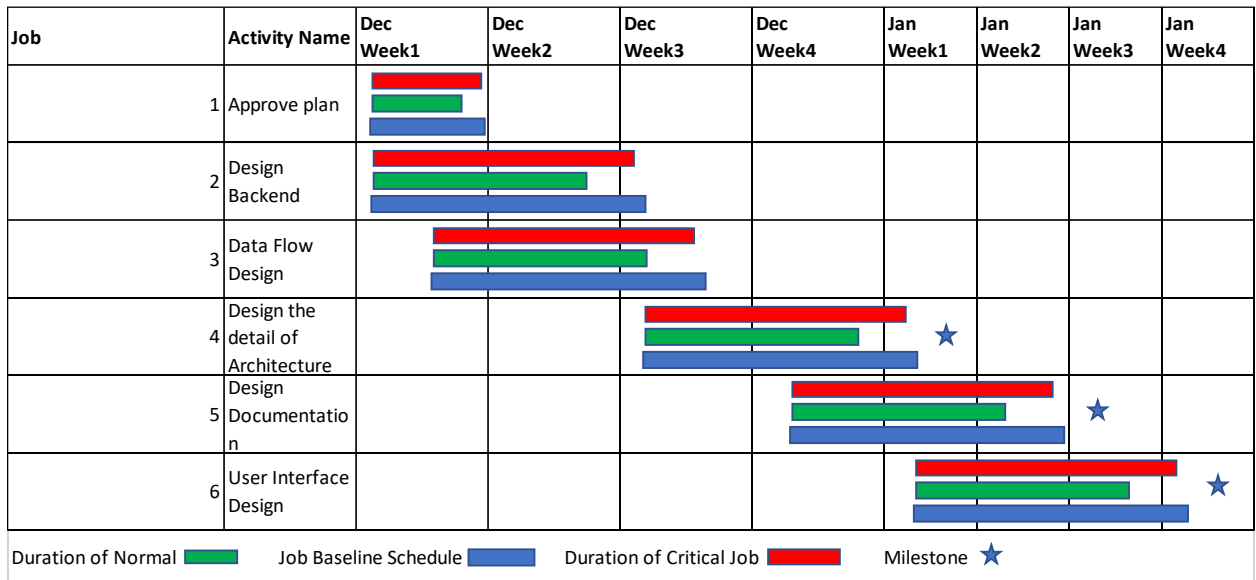


Table 13: Schedule Baseline of Design Activity for School of Maths Project

### 2.11 Estimate costs (Cost):

Process of developing an approximation of the monetary resources needed to complete project activities. Outputs: Activity cost estimates, basis of estimates, project document updates.

Activity Cost Estimates										
Project: Develop School of Math Mobile App								Date: 15/11/2022		
WBS No.	Resource	Direct Costs	Indirect Costs	Reserve	Estimate	Method	Assumptions/Constraints	Additional Information	Range	Confidence Level
3.1.1	2 Developers for 50 hours	50 hrs @10\$		25\$	500\$	Parametric	Must obtain functional manager approval to assign developer	N/A	xx-xx	8
3.1.1	Tester for 20 hours	20 hrs @10\$		10\$	200\$	Parametric	Assume all functionality and transaction of website will be available to access, search and register to MIS course.	N/A	xx-xx	7
3.1.1	External Advisor		12 hrs @10\$		120\$	Parametric	The idea of design and promotion to everyone to get and easy to understand	N/A	xx-xx	9

**Table 14: Activity cost estimate of PPC Project**

Basis of Estimate								
<b>Project:</b> Develop School of Maths Mobile App						<b>Date:</b> 15/11/2022		
WBS Element: 1 Project Planning								
Category	Material	Labor	Inirect Costs	Base Cost	Reserve	Total Cost	Funding Source	Cost Methodology
Planning	300\$	2500\$	0	2000\$	200\$	5000\$	New Product Dev.	Parametric
<b>WBS Description:</b> Complete the development of School of Maths Mobile App								
<b>Cost Description:</b> Labor is all inclusive of WBS element 1. Include 80 man hours of work performed at 10\$ per hour. Managment reserve of 10% has been identified based on a confidence level of 90%. Pricing was derived from existing hourly rates for one PMO employee and two Design Technology Group employees.								
WBS Element: 1.1 Gather Requirements								
Category	Material	Labor	Inirect Costs	Base Cost	Reserve	Total Cost	Funding Source	Cost Methodology
Planning								
<b>WBS Description:</b> Gather requirements for School of Math Development App								
<b>Cost Description:</b> Labor is all inclusive of WBS element 1.1. Includes 60 man hours of work performed at 10\$ per hour. Management reserve of 10% has been identified based on a confidence level of 90%. Pricing was derived from existing hourly rate for one PMO employee and two Design Technology Group employees.								

**Table 15: Example of basis estimate on Planning and Gathering Requirement phase on School of Maths Mobile App Project**

### 2.12 Determine budget (Cost):

Determine budget is a process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline. Generally, the Outputs of this process are: Cost performance baseline, project funding requirements and project document updates:

#### Cost Performance Baseline

According to <http://www.gristprojectmanagement.us> give a basic definition of cost performance baseline that “The cost performance baseline is an authorized time-phased budget used to measure, monitor, and control overall cost performance on the project. It is developed as a summation of the approved budgets by time period and is typically displayed in the form of an S-curve”, as is illustrated in Figure 3. The figure 3 just show the assumption of PCC MIS training course with funding requirement, cost baseline and expected cash flow.

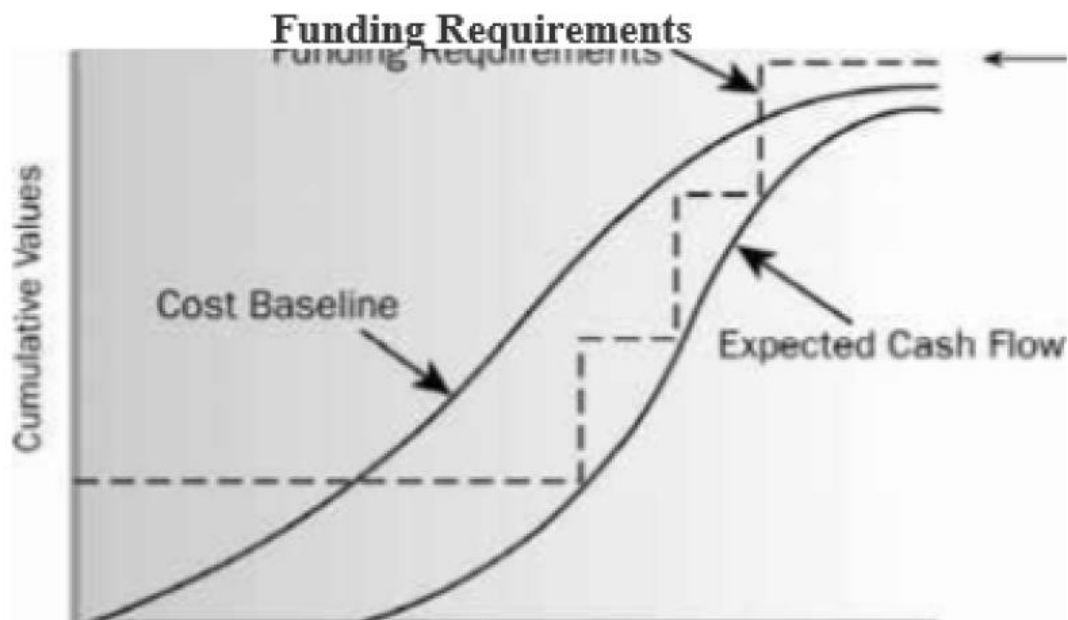


Figure 3: Example of Cost Performance Baseline of School of Math Mobile App

### Project Funding Requirement

Project Funding Requirement						
Project: Develop School of Maths Mobile App					Date: 15/11/2022	
Project phase	Funding type	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
Initiation	Manpower	\$500.00				
Initiation	Equipment/Capital	\$200.00				
Planing	Manpower		\$500.00			
Planing	Equipment/Capital		\$200.00			
Design	Manpower			\$600.00		
Design	Equipment/Capital			\$400.00		
Prototype Build	Manpower				\$700.00	
Prototype Build	Equipment/Capital				\$450.00	
Testing	Manpower				\$500.00	
Testing	Equipment/Capital				\$200.00	
Transition to operations	Manpower					\$100.00
Transition to operations	Equipment/Capital					\$300.00
Project closeout	Manpower					\$350.00
Project closeout	Equipment/Capital					
Totals		\$700.00	\$700.00	\$1,000.00	\$1,850.00	\$750.00

**Table 16: Project Funding Requirement of School of Maths Mobile App**

### 3. Project Execution

Processes performed to complete the work defined in project management plan to satisfy the project specifications. In this step, there are some major processes, which is included:

**3.1 Direct & Manage project execution (Integration):** Process of performing the work defined in the project management plan to achieve the project's objectives. **Outputs:** Deliverables, work performance information, change requests, project management plan updates, and project document updates.

**3.2 Acquire project team (Human Resource):** Process of confirming human resource availability and obtaining the necessary team to complete project assignments. **Outputs:** Project staff assignments, resource calendars, project management plan updates

**3.3 Perform quality assurance (Quality):** Process of auditing the quality requirements and the results from quality control measurements to ensure appropriate quality standards are used. **Outputs:** Organization process assets updates, change requests, project management plan updates, project document updates



**3.4 Develop project team (Human Resource):** Process of improving the competencies, team interaction and the overall team environment to enhance project performance.

**Outputs:** Team performance assessments, enterprise environmental factors updates

**3.5 Manage project team (Human Resource):** Process of tracking team member performance, providing feedback, resolving issues and managing changes to optimize project performance. **Outputs:** Enterprise environmental factors updates, organization process assets updates, change requests, project management plan updates

**3.6 Distribute Information (Communication):** Processing of making relevant information available to project stakeholders, as planned. **Output:** Organization process assets updates

**3.7 Manage stakeholder expectations (Communication):** Process of communicating and working with stakeholders to meet their needs and addressing issues as they occur.

**Outputs:** Organization process assets updates, change requests, project management plan updates, project document updates

**3.8 Conduct procurements (Procurements):** Process of obtaining seller responses, selecting a seller and awarding a contract. **Outputs:** Selected sellers, procurement contract award, resource calendars, change requests, project management plan updates, project document updates

#### **4. Project Monitoring and Controlling**

Processes required to track, review and regulate the progress and performance of the project.

**4.1 Monitor & Control project work (Integration):** Process of tracking, reviewing and regulating the progress to meet the performance objectives defined in the project management plan. **Outputs:** Change requests, project management plan updates, project document updates

**4.2 Perform Integrated Change control (Integration):** Process of reviewing all change requests, approving changes and managing changes to the deliverables, organization process assets, project documents and project management plan. **Outputs:** Change requests status updates, project management plan updates, project document updates

**4.3 Verify scope (Scope):** Process of formalizing acceptance of the completed project deliverables. **Outputs:** Accepted deliverables, change requests, project document updates

**4.4 Control scope (Scope):** Process of monitoring the status of the project and product scope and managing changes to the scope baseline. **Outputs:** Work performance measurements, organization process assets updates, change requests, project management plan updates, project document updates

**4.5 Control schedule (Time):** Process of monitoring the status of the project to update project progress and managing changes to the schedule baseline. **Outputs:** Work performance measurements, organization process assets updates, change requests, project management plan updates, project document updates

- 4.6 Control costs (Cost):** Process of monitoring the status of the project to update the project budget and managing changes to the cost baseline. **Outputs:** Work performance measurements, budget forecasts, organization process assets updates, change requests, project management plan updates, project document updates
- 4.7 Perform quality control (Quality):** Process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes. **Outputs** are quality control measurements, validated changes, validated deliverables, organization process assets updates, change requests, project management plan updates, project document updates
- 4.8 Report performance (Communication):** Process of collecting and distributing performance information including status reports, progress measurements and forecasts. **Outputs:** Performance reports, organization process assets updates, change requests
- 4.9 Monitor and control risks (Risk):** Process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks and evaluating risk process effectiveness throughout the project. **Outputs:** Risk register updates, organization process assets updates, change requests, project management plan updates, project document updates
- 4.10 Administer procurements (Procurements):** Process of managing procurement relationships, monitoring contract performance and making changes/corrections as needed. **Outputs:** Procurement documentation, organization process assets updates, change requests, project management plan updates

## 5. Risk Management

Project risk management is the art and science of identifying, analyzing, and responding to risk through the life of a project and in the best interests of meeting project objectives.

Unlike crisis management, good project risk management often goes unnoticed. Well-run projects appear to be almost effortless, but a lot of work goes into running a project well.

In this mobile application development project, the following risks and their mitigation measures and action plans are identified and listed below:

Type of Risks	Descriptions	Mitigation	Action plan
<b>1. Schedule risks</b>	Risks that impact the project schedule, such as delays, overruns, or missed deadlines.		
	<b>R01.</b> Vacation of a team member	Plan vacations in advance, add vacation of a team member to a roadmap.	Review the roadmap, ask another developer for part-time work, notify the client about changes.
	<b>R02.</b> A team member decides to quit	Build friendly team relationships on project	Review the roadmap, add another developer, if possible, open the new position, notify the client about changes.
	<b>R03.</b> Team member gets sick	NA	Review the roadmap, ask another developer for part-time work, notify the client about changes.
	<b>R04.</b> Changes in scope	Plan scope before sprint start, approve scope with the client & team, notify the client about the changelog and how changes affect the roadmap	Review the importance of the change, review if anything can be taken out of the scope. If possible, plan the change in the next or current sprint.

	<b>R05.</b> Delays in feedback/approval from client-side	Discovery and communication plan, clearly say how delays will affect us	Reminders, simplification if possible (split into several parts), set up calls to go over the materials together
<b>2. Cost risks</b>	Risks that impact the project budget, such as cost overruns, increased expenses, or decreased revenues.		
	<b>R06.</b> The app was rejected in PlayMarket / AppStore	Checking app for following the publication rules before a release, checking the test accounts, adding a photo/video of how it works	Cover the reason of rejection with a high priority, provide SMOKE testing, send app for review again
	<b>R07.</b> Not enough end-users after the release (defined timeframes)	Plan the user attraction before the release, start user attraction before the release	Add more marketing activities; conduct interviews with users, who have stopped using the product, review the feature list
	<b>R08.</b> Competitors released faster	Market and competitors research, define competitive advantage, release with small parts of functionality, start marketing activities before the release to have the user base.	Analyze competitors' solution and what can be done better, make emphasis on this part and release the product, review the marketing activities.
<b>3. Quality risks</b>	Risks that impact the quality of the project deliverables, such as poor-quality materials, low-quality workmanship, or poor-quality control.		
	<b>R09.</b> After release users found bugs/crash	SMOKE testing before release for 2 environments, high-load testing before release, acceptance	Evaluate the priority and severity of the task, if a bug is critical, add to the current Sprint, roll-

		testing by clients and PM	out according to roll-out plan. push hotfix if it's possible to back-end or web
	<b>R10.</b> Bad feedback about the product	Testing before the release to fix critical bugs, a soft launch to find and fix bugs + receive user feedback early	Answer user feedback, fix problem, reward a person, who found an issue (if a problem is in some issue) and make marketing out of this
<b>4. Technical risks</b>	Risks that impact the technical aspects of the project, such as unexpected problems with technology, equipment, or software.		
	<b>R11.</b> Major changes in environments/ dependencies/ rules/ 3rd party application of publishing	Regularly checking the changes and updates, adding the tasks for update dependencies, etc. to a roadmap	Evaluate the time needed for implementation changes, agree on the new release date
	<b>R12.</b> Complex internal system to integrate with	Add a task in Discovery for analysis of the current system, infrastructure, set up calls with the tech expert from client-side, request existing documentation on the internal system	Consultation with tech expert from client-side, review current situation to evaluate changes and update roadmap
	<b>R13.</b> Created architecture is not scalable when developing a product	Discuss the vision of the product with a project Tech Lead, short-term and long-term   Plan for extra time before the start of development for creating the product architecture	Review current architecture and how it should be changed, add changes to roadmap before scaling

	<b>R14.</b> Users do not use the core functionality	Define user's needs, test prototype with core functionality, set up analytics to track what is being used	Conduct interviews, define what functionality is mostly used, change the product vision or create another prototype with updated flows and test it
<b>5. Stakeholder risks</b>	Risks that impact the relationship between the project team and stakeholders, such as changes in stakeholder expectations, stakeholder dissatisfaction, or stakeholder disengagement.		
	<b>R15.</b> The conflict among stakeholders regarding the functionality	Regular calls, reports about project status with all stakeholders, stakeholders list and responsibilities identification, a plan of Discovery, show intermediate results to receive feedback	Review the change, its importance, review the scope what is possible to take out. If possible, take into this sprint or plan into the next one
<b>6. External risks</b>	Risks that are outside of the project team's control, such as changes in market conditions, regulatory requirements, or natural disasters.		

### Probability/Impact Matrix

<b>Probability</b>	High	R14	R04, R05	
	Medium	R12	R01, R10, R13	R03, R09
	Low	R08	R07, R11	R02, R06, R15
		Low	Medium	High
		<b>Impact</b>		

## **6. Closing The Project**

Process performed to finalize all activities across all process groups to formally close the project or phase.

**6.1 Close project or phase (Integration):** Process of finalizing all activities across all of the project management process groups to formally complete the project or phase.

**Outputs:** Final product, service or result transition, organization process assets updates

**6.2 Close procurements (Procurement):** Process of completing each project procurement.

**Outputs:** Closed procurements, organization process assets updates