TEXAS TECH UNIVERSITY.

Software Project Management

The Martial Arts Academy – School Management System

FINAL PROJECT REPORT

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Measurable Organizational Value

Total Areas of Impact:

Operational	Customer	Strategic	Financial
- Efficient management of student data	- Better customer experience and satisfaction	- Attract new students	- Increase in revenue can be observed once project is delivered and used.
- Effective structuring of the organization.	- Would be able to retain old ones.	- Provide a better service compared to competitors.	- Indirect impact.

- **Identify the desired area of impact –**
  - Operational – faster dealing student with info
    - Increase the efficiency in managing the student data.
    - Increase the efficiency searching available slot for the test.
    - Increase efficiency in calculating the discounts for the class they are enrolling.
  - Customer – Better Customer Experience
    - We will be able to attract the new students with better school management.
    - This helps to retain the existing students and improve their satisfaction.

  With respect to the goals of the academy, the most desired area of impact – **Operational and Customer.**

- **Identify the desired value of project –**
  - Better –
    - Better Organizing of student files.
    - Better Customer Experience & Satisfaction.
    - Apt scheduling of classes.
    - Facilitating the growth of customers in terms of user base.
  - Faster –
    - Faster in search query for data enquiry & slot availability for test.

- **Develop an appropriate metric –**
  - Customer Waiting time – for each query 5 sec.
    - When a customer asked to pay for these no. of class the amount after applying discount is having to reflected with in 5sec from 2mins.
  - Data Loss & Error – Reduce Data Loss & Error
    - No Manual Error, No Missing Data – Error <= 1%
  - Customer Experience & Satisfaction –
    - Retaining all the Existing Student i.e., 35 Students Currently
    - Adding new 10 Students every month.

- **Set a time frame for achieving the MOV –**
  - To develop the system & uploading the existing data - it takes 2 months.
  - Increase in operational efficiency can be seen instantly in one week, once system is setup.

- **Summarize the MOV -**

  This project would be considered successful when the error reduction is greatly achieved, and loss of data is reduced to 1 percent.

  The metric pertaining to waiting time of the customer for querying different results from the database could be drastically improved to around 5 seconds per query and the time to achieve this would be 2 months. This results in a smoother workflow in the customer experience after the metrics are achieved, milestones are met, and systems attained a successful closure.

A Comparison of Alternatives

Alternative A: In House Custom Project Development

Alternative B: Subscription-based – purchase a Pre-developed Software for School Management System and maintain it.

Alternative C: Do Nothing – Paper Based Card (Existing Method)

Alternatives / *TCO, TBO*	Alternative A	Alternative B	Alternative C
Total Cost of Ownership	-Upfront Cost: $9,600 (Consult) $700 (Hardware) -Indirect Cost: $500 (Travel) $40/Mon (Wifi) -Ongoing Cost: $100/Mon (Server)	-Upfront Cost: $6500 (Purchase) $700 (Hardware) -Indirect Cost: $40/Mon (Wifi) -Ongoing Cost: $260/Mon (Maintenance)	-Ongoing Cost: $100/Mo (Cards)
Total Benefit of Ownership	-Increasing high-value work -Improving accuracy & efficiency -Improved decision making	-Increasing high-value work -Improving accuracy & efficiency	-NA

Alternative A: In House Custom Project Development

Advantages:

- PLC & SDLC are in control
- Budget management
- Risk identification & analysis efficient
- Ownership
- Customize the new features
- Data Confidently
- We can embed the Store Inventory Management feature

Disadvantages:

- Initial Investment (one time investment)
- Team management
- Maintenances

Alternative B: Subscription-based - purchase a Pre-developed Software for School Management System and subscribe for it.

Advantages:

- No Initial Investment (one time investment)
- No Team management
- Subscription-based Investment & Maintenances
- No Store Management feature inbuild

Disadvantages:

- Must model the whole system & upload the existing records by ourselves
- Separate Investment for Store management feature
- No Risk identification & analysis efficient
- No Ownership
- No Customize the new features development
- Complete dependency
- Needed Technical Knowledge
- No Data Confidently

Alternative C: Do Nothing – Paper Based Card (Existing Method)

Advantages:

- Minimal Investment
- Simple

Disadvantages:

- No Data Confidently
- Error Prone
- High Risk of Data loss

For a Span of 5 Years:
Alternative A – 10800+ 140x12x5 = $19,200
Alternative B – 4500 + 300x12x5 = $25,200

A Recommendation

Regarding the above alternatives, it's clear that the inhouse project has advantages in term of the TBO compared to other 2 alternatives. Data Continentality, Customize and ownership of application would recommend considering the alternative 1. Also, any purchased school management project software's are limited with functionalities and even the data confidentiality is an issue.
Considering all these factors, Alternative A is recommended. Considering the TCO & TBO with all alternatives, we recommend alternative A.

A List of Resources Needed to Complete the Project

a. People (and their roles)

a. Project Manager – Look over whole project progress & delivery to clients.
b. Developers (2) – To model(interface) & develop the application
c. Tester – To test the application & Database efficiency
d. Database Admin - To model the efficient database with schemes & uploading the existing manual record in file to database

b. Technology

a. Java SE, Java EE & database software

c. Facilities

a. A Server to deploy the application
b. A System to monitor the progress

d. Other

a. Travelling
b. Training of Project Management activates

An Estimate for the Cost of Each Resource

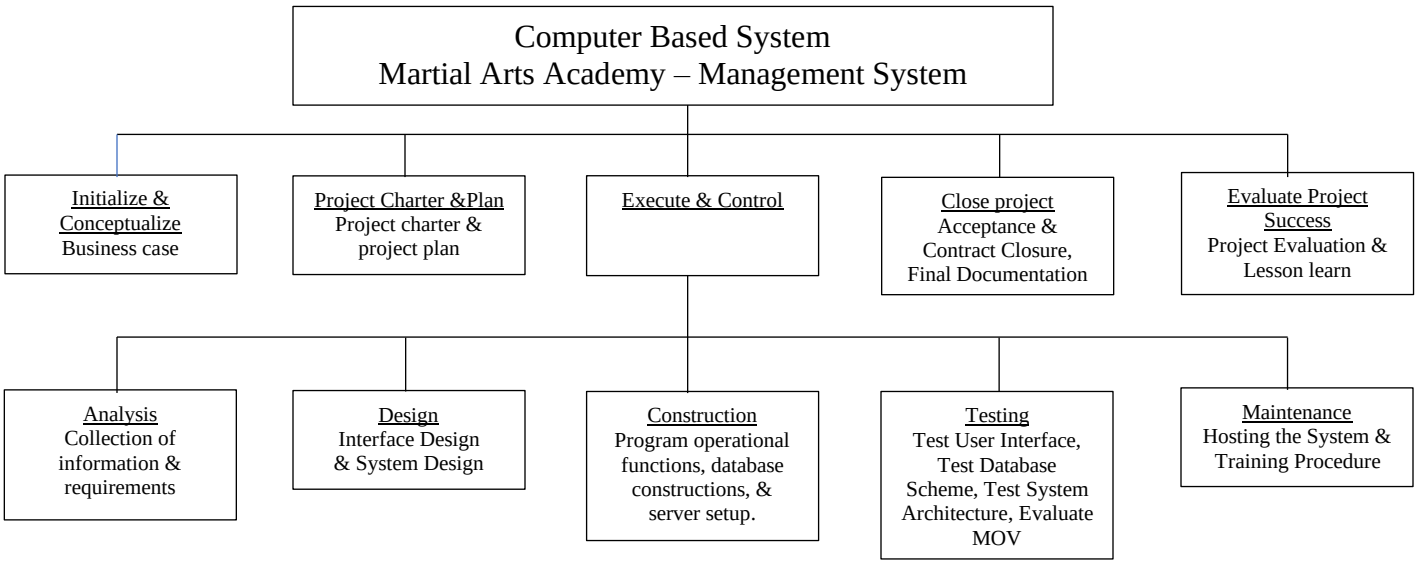
a. People – hourly pay, reference - PayScale
   Project Manager - $35 per hour
   Developer – avg of $25 per hour
   Tester - $18 per hour
   Database Admin - $20 per hour
b. Technology – Open Source free $0
c. Facilities – Server Hosting - $100, System - $700 reference - Serverania, Dell
d. Other - $500 per month (Occasionally)

Since you will be paid for your work with MAA, decide which contract makes the most sense for you and your client.

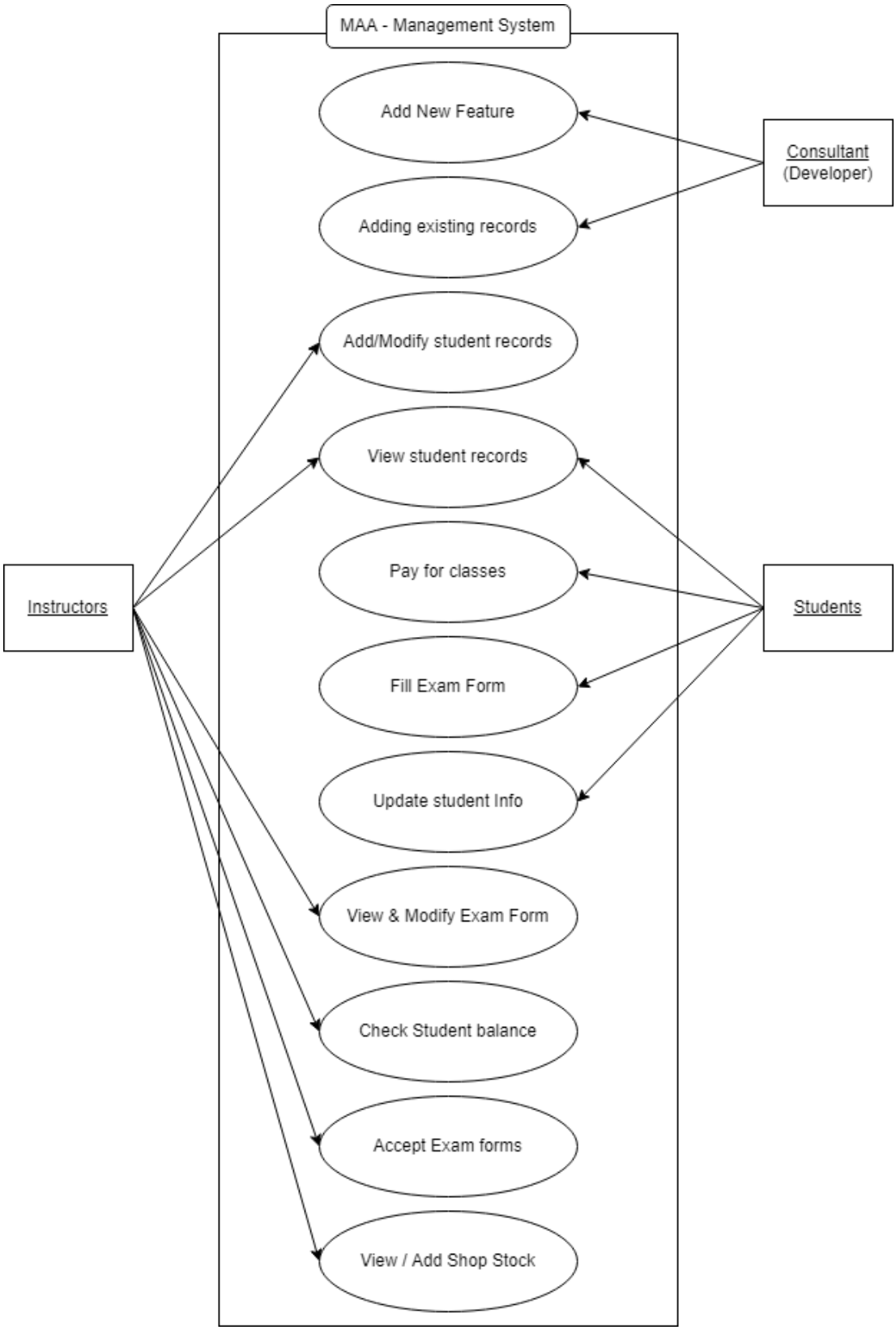
a) Time – hourly pay

A Deliverable Structure Chart (DSC)

Using the Waterfall Model (SDLC)



A Use Case Diagram (UCD)



Convert your Deliverable Structure chart (DSC) to a WBS

-0.0 Martial Arts Academy
- -1.0 Initialize & Conceptualize
  - -1.1 Business Case
    - -1.1.1 Client Meeting
    - -1.1.2 Gather Information
    - -1.1.3 Create MOV
    - -1.1.4 Check Alternatives
    - -1.1.5 Costs
  - -1.2 Present Business Case to client
  - -1.3 Milestone: Business Completed
- -2.0 Project Charter and Plan
  - -2.1 Identify the requirements
    - -2.1.1 Finalize the resources
    - -2.1.2 Finalize the costs
  - -2.2 Milestone: Project charter and plan completed
- -3.0 Execute and Control
  - -3.1 Buy Electronic Components.
  - -3.2 Develop the application
    - -3.2.1 Analysis
      - -3.2.1.1 Collection of Information & Requirements
    - -3.2.2 Design
      - -3.2.2.1 Interface Design
      - -3.2.2.2 System Design
    - -3.2.3 Construction
      - -3.2.3.1 Program Operational functions
      - -3.2.3.2 Database Creation
      - -3.2.3.3 Server Setup
    - -3.2.4 Testing
      - -3.2.4.1 Test User Interface
      - -3.2.4.2 Test Database scheme
      - -3.2.4.3 Test System Architecture
      - -3.2.4.4 Evaluate MOV
    - -3.2.5 Maintenance
      - -3.2.5.1 Hosting System
      - -3.2.5.2 Training Procedure
  - -3.3 Milestone: Implementation Completed

-4.0 Close Project
    -4.1 Project Documentation
    -4.2 Payment Invoice
-5.0 Evaluate Project
    -5.1 Import Existing user records
    -5.2 Evaluate for Accuracy
-6.0 Milestone: Project Completed

A Detailed Project Plan:

1. Using the work breakdown structure that you created in the previous assignment, assign a cost for each resource based on the project infrastructure that you developed in the assignment Chapter 4.

Task ID	Task Name	Duration	Owner	Cost for Resources
1	-0.0 Martial Arts Academy – School Management System	**33**	Client	
2	-1.0 Initialize & conceptualize	**4**	Project Manager	**$1120**
3	-1.1 Business Case	3	Project Manager	
4	-1.1.1 Client Meeting	1		
5	-1.1.2 Gathering Information			
6	-1.1.3 Create MOV	1		
7	-1.1.4 Check Alternatives	1		
8	-1.1.5 Costs			
9	-1.2 Present Business Case to client	1	Project Manager	
10	-1.3 Milestone: Business Completed			
11	-2.0 Project Charter and Plan	**1**	Project Manager	**$280**
12	-2.1 Identify the requirements	1		
13	-2.1.1 Finalize the resources			
14	-2.1.2 Finalize the costs			
15	-2.2 Milestone: Project charter and plan completed			
16	-3.0 Execute and Control	**24**	Project Developers	**$7072**
17	-3.1 Buy Electronic Components	1		
18	-3.2 Develop the application	23		
19	-3.2.1 Analysis	1	Project Manager	**$280**
20	-3.2.1.1 Collection of Information & Requirements	1		
21	-3.2.2 Design	2		**$1120**
22	-3.2.2.1 Interface Design	2	Project Developers	
23	-3.2.2.2 System Design	2	DB Admin	

24	-3.2.3 Construction	6	Project Developers	**$3040**
25	-3.2.3.1 Program Operational functions	6		
26	-3.2.3.2 Database Creation	3	Database Admin	
27	-3.2.3.3 Server Setup	1	Database Admin	
28	-3.2.4 Testing	3	Tester	**$712**
29	-3.2.4.1 Test User Interface	1		
30	-3.2.4.2 Test Database scheme	1		
31	-3.2.4.3 Test System Architecture	1		
32	-3.2.4.4 Evaluate MOV	1	Project Manager	
33	-3.2.5 Maintenance	2	Project Developers	**$800**
34	-3.2.5.1 Hosting System	1		
35	-3.2.5.2 Training Procedure	2		
36	-3.3 Milestone: Implementation Completed	0		
37	-4.0 Close Project	**2**	Project Manager	**$560**
38	-4.1 Project Documentation	1		
39	-4.2 Payment Invoice	1		
40	-5.0 Evaluate Project	**2**	Project Manager	**$560**
41	-5.1 Import Existing user records	1		
42	-5.2 Evaluate for Accuracy	1		
43	-6.0 Milestone: Project Completed	**0**	Project Manager	
			Total:	**$9600**

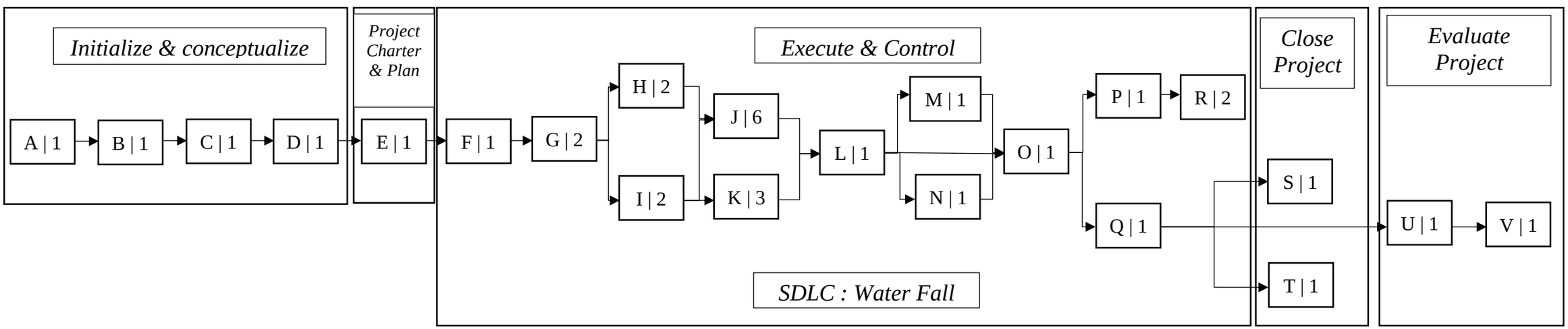
2. Link the tasks. Look for opportunities to shorten the project schedule by performing tasks in parallel (i.e., start-to-start or finish-to-finish).

   Activities of AON

Activity	Description	Estimated Duration (Days)	Predecessor
A	Client Meeting & Gathering Information	1	-
B	Create MOV	1	A
C	Check Alternatives & Costs	1	B
D	Present Business Case to client	1	C
E	Finalize the resources & finalize the costs	1	D
F	Buy Electronic Components	1	E
G	Collection of Information & Requirements	2	F
H	Interface Design	2	G
I	System Design	2	G
J	Program Operational functions	6	H, I
K	Database Creation	3	I
L	Server Setup	1	J, K
M	Test User Interface	1	L
N	Test Database scheme	1	L
O	Test System Architecture	1	L, M, N
P	Evaluate MOV	1	O
Q	Hosting System	1	O
R	Training Procedure	2	P
S	Project Documentation	1	Q
T	Payment Invoice	1	Q
U	Import Existing user records	1	Q
V	Evaluate for Accuracy	1	U

Activity on the Node Network Diagram

Format: Activity | No. of days to Complete Activity



Possible Paths Through the Network Diagram

Possible Paths	Path	Total
Path 1	A+B+C+D+E+F+G+H+J+L+M+O+Q+U+V	22*
	1+1+1+1+1+1+2+2+6+1+1+1+1+1+1	
Path 2	A+B+C+D+E+F+G+I+K+L+N+O+Q+U+V	19
	1+1+1+1+1+1+2+2+3+1+1+1+1+1+1	
Path 3	A+B+C+D+E+F+G+H+J+L+N+O+Q+U+V	22*
	1+1+1+1+1+1+2+2+6+1+1+1+1+1+1	
Path 4	A+B+C+D+E+F+G+H+K+L+M+O+Q+U+V	19
	1+1+1+1+1+1+2+2+3+1+1+1+1+1+1	
Path 5	A+B+C+D+E+F+G+H+K+L+N++O+Q+U+V	19
	1+1+1+1+1+1+2+2+3+1+1+1+1+1+1	
Path 6	A+B+C+D+E+F+G+I+J+L+M+O+Q+U+V	22*
	1+1+1+1+1+1+2+2+6+1+1+1+1+1+1	
Path 7	A+B+C+D+E+F+G+I+J+L+N+O+Q+U+V	22*
	1+1+1+1+1+1+2+2+6++1+1+1+1+1+1	
Path 8	A+B+C+D+E+F+G+I+K+L+M+O+Q+U+V	19
	1+1+1+1+1+1+2+2+3+1+1+1+1+1+1+1+1	

*Critical Path

The longest path in the AON network diagram is **22 days**. This tells us that our project is estimated to take 22 days. Path 1,3,6,7 is the critical paths. The **critical path** is the longest path in the project network and is also the shortest time in which the project can be completed.

Answer the following questions:

a. What are the beginning and end dates for your project? How many days will it take to complete the project?
   Begin Date – 08/01/2022
   End Date – 08/30/2022

   It takes 22 days to complete the project excluding the weekends.

b. Does your project have a single critical path or multiple critical paths? What is the importance of the critical path?

   Our Project has Multiple critical paths i.e., Path 1, 3, 6, 7. It gives you an assessment of actual time versus planned time, so you can see where you currently are in your progress.

c. Does your project have any over-allocated resources? If so, be sure to level your resources.
   No, there wasn't any over-allocated resources.

A Project Risk Analysis and Plan.

1. Using the Risk Identification Framework in Figure 7.2 as a basis, identify a total of five risks to your project. More specifically, identify one risk for each of the five phases of the project methodology depicted in the outer ring of the framework. Then, use the framework for analyzing each risk by moving from the outer ring to the center.

Phases	Initialize and conceptualize	Project Plan and Charter	Execute and Control	Closure Project	Evaluation
Risk	Budget Changes/Cuts	Scope Change	Change Problems	Client Project Conflict	Unexpected Maintenance
Type of Risk	Unknown-unknown	Known-unknown	Known-unknown	Known-unknown	Known-unknown
Source of Risk	Internal	Internal	Internal	Internal	Internal
Resource	Organization	People & Process	Technology	People, Product, Process and Technology	Technology, and Other
Triple Constraint	Budget	Scope	Schedule	Quality	Schedule

2. For each of the five risks identified, assign an owner to each risk, and describe a strategy for managing each particular risk.

Risk	Owner	Strategy
Budget Changes/Cuts	Project Manager	Management reserves (T)
Scope Change	Project Manager	Avoidance (T)
Change Problems	Developer	Exploitation (O)
Client Project Conflict	Client & Project Manger	Avoidance (T)
Unexpected Maintenance	Client	Accept or ignore (T)