TERM PROJECT

THE MARTIAL ARTS ACADEMY (MAA) – School Management System

GROUP 1
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Overview

Over the course of more than 30 years, Grandmaster Taylor has both studied and taught martial arts. Two of Grandmaster Taylor's black-belt instructors, Geoff and Julie, bought the Martial Arts Academy from him. The Martial Arts Academy now has 35 students of various categories, from novice white belts to skilled black belts. Classes last 60 minutes and are taught by a black-belt instructor. Student needs to sign a contract which includes Name, Address, Phone number, Birth data, and Liability waive. These class contains 70% Male and 30% Female. Class are conducted in 2 ways – Kid's classes which is applicable to student whose age is in between 6-12 and Adult's classes which is applicable for student's age 13 or above.

Student's Information is stored in File Folder and kept in File cabinet which easily accessible to anyone. Student's need to pay in advance for class and they will get discounts if they registered few days before classes. For Attendance, Students have 'Class cards' method which they collect from Front desk and place the card near the entrance of the particular class or workout area. Once class finish, Instructor (Black belt one) will pick that card from the entrance of the class. Write that student name, class name and attended date. For Checking Student's Progress, After eight class, On that card, Initials will be highlighted by instructor and place a paper clip to indicate that student receive eight hours of instruction. This paper clip and highlighter on initial helps them to track the student's progress. They called it as "Stripe". Then, Instructor will check card and called that student in front of class where they are congratulate. Instructor places a piece of black plastic tape around the end of belt which helps instructor to check student's progress.

MMA have some issue in their current system – System is paper based which affordable and simple to use, but it's not perfect and inefficient. They have some common issues like Instructor might fail to highlight initial after 8 class, They might failed to attach paper clip to that Card, Paper clip falls off the card, Safety about Student's information or manual work. Efficiency and Accuracy is not achievable using Paper based which causes the lack of customer experience in academic. They are lacking in because of some reason - Other Martial art school in the same area, Student's other interest in different sports like soccer, baseball, or Adults and teenagers find difficult to maintain regular training schedule or 2 martial art schools and one martial art club at the university or Pricing/Payment fee.

Julie and Geoff, they need new system for their academic progress. Because, they don't have expertise knowledge in Computer/Technical world, they are expecting us to suggest and design system in minimal price which gives them maximum benefit. Julie and Geoff are interested in investing money, time and resources to gain some reasonable return on the investment. We have researched on their given requirements, find out some affordable and quality suggestions for them and recommend good product for their academy. We are going to discuss about Measurable Organization Value (MOV), Business Case, Project Infrastructure, Scope Management, WBS and Risk Management Framework related to our requirement.

Project Part 1

Question 1:

The MOV is the goal of the project and is used to define the value that your project will bring to your client. It will also be used to evaluate whether your project was a success later. You would work very closely with your client in developing the MOV. Your responsibility would be to lead the process, while the client would commit to specific areas of impact, metrics, and time frames. Once the MOV is defined, it becomes the responsibility of all the project stakeholders to agree whether the MOV is realistic and achievable. For the purposes of this assignment, you will have to come up an MOV on your own. You are free to be creative, but please strive to make the MOV realistic. For our purposes, learning how to develop an MOV is an important process. Use the following steps to define your project's MOV:

1. Identify desired area of Impact
2. Identify the desired value of the project
3. Develop an Appropriate Metric
4. Set a Time Frame for achieving MOV
5. Summarise the MOV in a clear and concise statement

Identify the desired area of impact

An organization may be impacted by a project in a variety of ways - Customer, Strategic, Financial, Operational, Social. Initiate this process by posing the following query to the client, customer, sponsor, or group of stakeholders: "Is the desired impact of the project strategic, customer, financial, operational, or social?". In Our Proposed MOV, we consider 4 impact area – Strategic, Operational, Customer and Financial.

Table 1: MAA Desired Areas of Impact for Project

Rank	Potential Area of Impact	Desired Impact	Justification
1	**Strategic**	Retain old customers and attracts new customer	MAA seeks to stay in business by improving student turnover.
		Increase competitive advantage against competing interests.	MAA realizes that their competition and greatest opposition to student turnover and by inference staying in business are other sports and individual personal commitments.
2	**Operational**	Improved Operational Efficiency	1. We are collecting and storing records in system which helps us to avoid mistakes, to avoid data loss, session scheduling. 2. If we go with the Subscription based technology for Computer based implementation, there will be more efficiency in work, no system maintenance is required or database maintenance is required.
		Enhanced Quality of Service	1. We can achieve Efficiency and accuracy in the work. 2. System will keep track of Student's progress accurately, Notify Student's progress to the instructor, helps to store records on system.
3	**Customer**	Improve customer service for both Student and Instructor	1. By providing digital cards, Students don't require to collect card from their office, they can bring their own digital card and swipe at the entrance of workout area. 2. Instructors don't require to collect those cards for marking attendance. Information will be automatically stored in Computer based System.

			3. After 8th day, System will calculate student's progress and mark his/her progress and send an Email/SMS alert to Instructor for tracking student's progress. 4. Instead of using black plastic tape, Instructor can update student's progress in Computer-based System. 5. Instead of using Paper clip and Card system, if we use Computer based system, we don't need to worry about losing cards and missing their paper clips.
		Customer Privacy	1. Students needs to fill form on paper for their test which contains their information like personal information, payment transaction. 2. Students need to sign a contract which includes Name, address, phone number on paper based. It increases the chances that the information might get stolen. This is overcome by computer-based system.
4	**Financial**	Maximum returns in minimum Investment	MAA is small business who are looking for growth in market, estimated cost of the software will be less, but return of investment will be more such as minimum time required of training schedule, customer privacy, tracking student's progress.

Identify the desired value of the project

The following step is to determine the intended value the project can provide to the organization once the target area of influence has been established. There are 4 common question that we need to consider while identifying desired area of impact –

1. *Will the project help the organization do something* **better***?*
2. *Will the project help the organization do something* **faster***?*
3. *Will the project help the organization do something* **cheaper***?*
4. *Will the project help the organization* **do more** *of something that it's currently doing?*

Table 2: MAA Desired Values for Project

Desired Value	Explanation
Better	MAA wants to be more efficient at maintaining Student's record, tracking Student's Progress and scheduling their training session. It helps Instructor/trainer to save time in manual work and helps them to avoid mistakes. They want to move from paper based to computer-based system.
Cheaper	When looking for a student and their class schedule, MAA seeks a system that will streamline the process and boost business efficiency.
Faster	When looking for a student and their class schedule, MAA seeks a system that will streamline the process and boost business efficiency.
Do more	MAA will provide Digital access cards to Students for marking their attendance, students just need to swipe cards at the entrance of training room. It will automatically calculate student's name, date and class session, Instructor is not going to add those data manually in Paper based system. This will increase overall revenue, provides benefits to their customer base (Students and Instructor).

Develop an Appropriate Metric

- The project will be successful if 10 new students register in MAA.
- The project will be successful if there are less than 2 student withdrawals (to competition).
- The project will be successful if there is an 70% return on investment to the project.

Set a time frame for achieving the MOV

The next stage is to agree on a precise time period when you and the organization have reached consensus on the target metrics that will have the desired impact on the organization.

Time Period	Explanation
2 months	Reduced Instructor's workload for maintaining student record, attendance, their progress, data loss.
5 months	Increase number of new students by 40% using convenient schedule work.
10 months	20% reduction in overall expenditure due to an automation because we are not using paper, paper clip, any plastic tape, no file system is required.

Summarize the MOV in a clear, concise statement or table

- The project will be successful if there are 10 new students registered in MAA in 5 months.
- The project will be successful if there are less than or equal to 2 withdrawals from MAA to competition in 2 months.
- The project will be successful if there is an 70% return on investment from the project 10 months after system deployment.

Question 2:

A comparison of alternatives—To keep things simple, you may consider only three alternatives for your client: maintain the status quo (i.e., do nothing), purchase a software package, or build a custom system. Using the Internet or library, determine whether any software packages currently exist that you think may support MAA's requirements. If more than one exists, then select one that you feel may be the best option for your client. Compare each of the alternatives based on the following criteria:

A. **Total cost of ownership (TCO)—This can be only a rough estimate at this time. Later, you will develop a detailed project schedule and budget that can be compared to your ballpark estimate. Currently, MAA has a manual, paper-based system. If MAA purchases a software package or builds a system, it will need one desktop computer. Determine any other hardware and software that the company may need. This will require a reasonable amount of research using the Internet, library, or company catalogs to estimate the cost of the hardware and software and to support your initial estimate. Keep in mind that total cost of ownership should include:**
   - All direct or upfront costs
   - Indirect costs
   - Ongoing support and maintenance cost

B. **Total benefits of ownership (TBO)— Total benefits of ownership should include all the direct, indirect, and ongoing benefits for each proposed alternative. It should focus on:**
   - Increasing high-value work
   - Improving accuracy and efficiency
   - Improved decision making
   - Improving customer service

Total cost of ownership (TCO)

All of the expenses related to the application system must be taken into consideration when deciding whether to invest in an IT project. Total cost of ownership (TCO), a term that has received a lot of attention, refers to the sum of the costs associated with purchasing, creating, maintaining, and supporting a product or application system over the course of its useful life.

It includes –

- All direct or upfront costs
- Indirect costs
- Ongoing support and maintenance cost

Table 3: Total Cost of Project

Total Cost of Ownership (TCO)				
	Explanation	**Alternative A - Paper Based System**	**Alternative B – Purchasing a software package [Zoho CRM]**	**Alternative C – Build a custom system [MAA System]**
Project Role	B - Project Manager, Developer, Tester, Business Analyst - 20 weeks C - Project Manager, Developer, Tester, Business Analyst, Database Administrator (DBA), Hardware Technician - 20 weeks	$ 0.00	$ 94400.00	$ 140000.00
Hardware	B – Workstations C - Workstations, Server, Network, Router, Firewall, Switch, Ethernet, Cables, UPS	$ 0.00	$ 1500.00	$ 3000.00
Software	B - Cloud application license (Zoho CRM) user/year C - MySQL server license, Oracle License, Development tools support per year	$ 0.00	$ 168.00	$ 800.00
Training	3 Day Training ($500 per day)	$ 0.00	$ 1500.00	$ 1500.00
Maintenance and Support	B - Its manageable by third party system C - Need Hardware and Software Maintenance / Support ($1000 per year)	$ 0.00	$ 50.00	$ 1000.00
Facilities	Office Space, Communications and Other Utilities	$ 0.00	$ 8000.00	$ 15000.00
Total Cost		**$ 0.00**	**$ 105618.00**	**$ 161300.00**

Total Benefits of ownership (TBO)

Each recommended alternative's immediate, ongoing, and indirect benefits must be factored into the TBO, or total benefits of ownership. Over the course of its useful life, the TBO should take into consideration the advantages of an alternative.

We can get those benefits from –

- Increasing high-value work
- Improving accuracy and efficiency
- Improving decision making
- Improving customer service

Table 4: Total benefits of ownership (TBO)

Total benefits of ownership (TBO)				
Benefits	**Explanation**	**Alternative A – Paper Based System**	**Alternative B - Purchasing a subscription-based software package [Zoho CRM]**	**Alternative C - Building a custom system [MAA System]**
Quality of Work	• Instead of spending time on class scheduling or tracking student's progress on Paper based method, Instructor will spend less time in Computer based method and all given more time for instructing / guiding student, it helps MAA to gain Student's performance which might leads to attract more new customer.	2	5	5
Improving accuracy and efficiency	• Using the paper-based technique, instructors might forget to mark student progress. • They might fail to attach paper clips to their Class Cards, or the paper clip could be lost. • This is very inefficient. Using the computer based, we can avoid these kinds of mistakes and improve accuracy. Students would just need to swipe their digital cards and be automatically identified and tracked for the day. • Automatic progress notifications will be sent to instructor after 8th day. Also, by getting rid of the file folders, we will avoid duplication of records.	2	5	4

Improving Quality of Service	• By increasing operational efficiency and effectiveness as well as minimizing mistakes in work and by providing faster and reliable service using the information system, we can improve on the quality of customer service. • Also, the use of an information system would offer students the ability to schedule and reschedule classes seamlessly to fit the desired timelines.	1	5	4
Increased number of new students and retain old studets	• By providing a more faultless system, MAA can perform well and give better outcomes in terms of class scheduling, tracking student's progress or in payment. It will help to retain old customers and gain new customers through their word-of-mouth publicity and recommendations. • Also, the use of an information system will give MAA an opportunity to go into offering online classes. This would marginally increase the number of students as well as avoid student withdrawal due to competing personal commitments.	2	4	4
Maximum return on investments	• Given that the information system would foster student retentions and offer a means of attracting new students, as well as other tangible benefits, it offers a maximum return on investment.	3	5	3
Minimum investment	• Given that MAA has only 35 students presently it requires a system that would require minimum investments but return the most benefits.	5	4	1
Improved Operational Efficiency	We are collecting and storing records in system which helps us to avoid mistakes, to avoid data loss, session scheduling. There will be more efficiency in work, no manual work is required.	2	5	5
Total Benefits		17	33	26

Question 2:

A recommendation—At this point, you may have more questions than answers and feel that you are being forced to make many assumptions. This is common for many real project teams and consultants at this stage of the project. You'll gain confidence from experience, doing good research, and paying attention to the details. Now, you are ready to make a recommendation to your client and support it. Given the limited amount of information and time, you should still be confident that your recommendation provides the best value to the organization and that the benefits outweigh the costs. Be sure that you not only recommend one of the three alternatives, but that you provide support based on your analysis to back it up. The client will decide whether to continue to the next phase of the project. If the project continues, a detailed schedule and budget will provide a clearer picture of the project's true costs, and another decision whether to fund and support the project in the next phase will be made.

Recommendation

In making our recommendations, we have considered the MOV, total cost of ownership and total benefits of ownership. Recall that Julie and Geoff have made the following statements:

1. They want to build an information system but do not have enough knowledge
2. Geoff feels MAA needs to hire someone to build a custom application, but they do not have the skills to develop or maintain one.
3. Julie has found 2 ways:

a. Install some software packages on their workstation
b. Get some subscription-based software and hosted by some third party through web.

4. They are ready to spend money, time, and resources to gain some reasonable return on investment.
5. Julie does not want to buy a computer system and pay consultants just to automate the existing file-card system.
6. Geoff insists that anything we recommend must pay for itself and provide benefits; otherwise, we must stick with the paper-based system.

Hence, in line with these stakeholder objectives we recommend that MAA purchases a custom subscription-based package, which is alternative B. Specifically, we recommend that they purchase Zoho CRM. In addition to this, we also recommend the use of digital access cards for students and instructors.

Zoho CRM is cloud-based application system which will help MAA to store student information online, manage student attendance and can keep track of student progress, accounting and for communication with students and instructors or for online marketing and sales. Zoho CRM is little cheaper than any other subscription-based tool or custom based system. With Zoho, and MAA will not need to worry about system/database support and maintenance, it is handled by Zoho enterprise.

This alternative at this point is most profitable because it provides the most benefits and maximum returns on minimum investments (refer to Table 5). Because Zoho CRM is user-friendly, it will not require a lot of skills to use. The software engineering team will also implement Zoho CRM to suit the business needs of MAA as well as link the digital access cards with the Zoho database. With the Zoho CRM, Julie and Geoff will not need to maintain the system as it will be maintained by Zoho on a subscription basis unlike alternative C which would require an investment into maintenance costs and development costs.

The use of alternative B will also offer tangible benefits in the form of retaining the current student base. It will also create an opportunity for MAA to increase their student base by opening doors to the possibility of online classes which alternative A cannot provide.

Zoho CRM will also aid the organization in dealing with their problems of operational inefficiency and accuracy in dealing with attendance, payment, and tracking student progress as well as scheduling automatically. In conclusion, we think that this Zoho CRM based method will best accomplish the organization's MOV, while supporting the statements set forth by Geoff and Julie.

Our recommendation is to develop a Zoho CRM based system for Martial Art Academy (MAA).

Project Part 2

Question 1:

A list of the resources needed to complete the project. This should include:
a. People (and their roles)—Your team is responsible for planning the project. However, the project may need additional individuals with both technical and nontechnical expertise to develop the system.
b. Technology—In the previous assignment, you estimated the hardware, network, and software needs for a system to support your client. You will also need various hardware, network, software, and telecommunication resources to support the project team.
c. Facilities—Husky Air has limited space. The project team will have to do most of its project and development work at a different site.
d. Other—For example, travel, training, and so on

List of Resources

Table 5: List of Resources

Resources	Details
People	Project Stakeholders - providing business requirement and funds for the project
	Project Manager - Project planning, scheduling, budgeting, execution, and completion
	Business Analyst - Analyze previous and present business data with the primary objective of enhancing organizational decision-making processes and demand gathering
	Software Developer - create, design, and implement computer programs
	Software Tester - accountable for the deployment and quality of software
Technology	Hardware - Workstations
	Software - Cloud application license (Zoho CRM) user/year
Facilities	Office Space - Work space for team to work at during project timeline
	Communications
	Other Utilities
Other	Training - 3 Day Training for their employee on software
	Maintenance and Support - Need to give maintenance and support for initial days after implementation

Question 2:

An estimate for the cost of each resource—Use the Internet, trade journals, newspaper advertisements, or any other sources. For example, if you need to hire a programmer, then you could use job postings or salary surveys as a basis for an annual base salary or hourly wage. The people who work on the project (including you and your team) will be paid a base salary or hourly wage plus benefits. Therefore, the cost of any people on your team will be a base salary (the person's gross income) plus an addition 25 percent paid out in benefits. Be sure to include a reference for all the sources you use.

Table 6: Resources Cost Estimates

	Explanation	**Subscription based software package**
People	Project Manager (Salary for 800 hours)	$ 30400.00
	Business Analyst	$ 27200.00
	Software Developer	$ 18400.00
	Software Tester	$ 18400.00
Technology	Hardware - Workstations	$ 1500.00
	Software - Cloud application licence (Zoho CRM) user/year	$ 168.00
Facilities	Office Space	$ 8000.00
	Communications	
	Other Utilities	
Other	Training - 3 Day Training for their employee on software	$ 1500.00
	Maintenance and Support	$ 50.00
Total cost		$ 1,05,618.00

Question 3:

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

- **a. Fixed price or lump sum**
- **b. Cost-reimbursable**
  - **i. Cost-plus-fee or cost-plus-percentage of-cost**
  - **ii. Cost-plus-fixed-fee**
  - **iii. Cost-plus-incentive-fee**
- **c. Time and materials**

Given that we have been able to determine the unit rates for the resources and the unit rate for subscription to Zoho CRM based on time as well and the fact that we do not yet know for certain the full cost of the project, we recommend that a Time and materials contract be used. Also, the price for the subscription to Zoho CRM is non-negotiable given that it has already been set by Zoho Enterprises.

Project Part 3

Question 1:

A deliverable structure chart (DSC)—This should be based on the project life cycle and the systems development life cycle. You should begin by creating a hierarchical chart that defines all the project and system development phases. The system development phases will depend largely on the development approach you use (Waterfall or Agile). After you have identified all project phases, the next step in developing a DSC is to identify at least one project or product deliverable for each phase.

We have decided to implement incremental development in developing the system so that we are able to have a working system early in the software development life cycle.

Making a deliverable structure chart is a helpful method for defining the project-oriented deliverables (DSC). The project life cycle (PLC) and systems development life cycle (SDLC) phases are both mapped by the DSC for every project deliverable. All the project-related deliverables that must be supplied by the project team are defined by the DSC. Each step should result in at least one deliverable, and each output should have a clear objective.

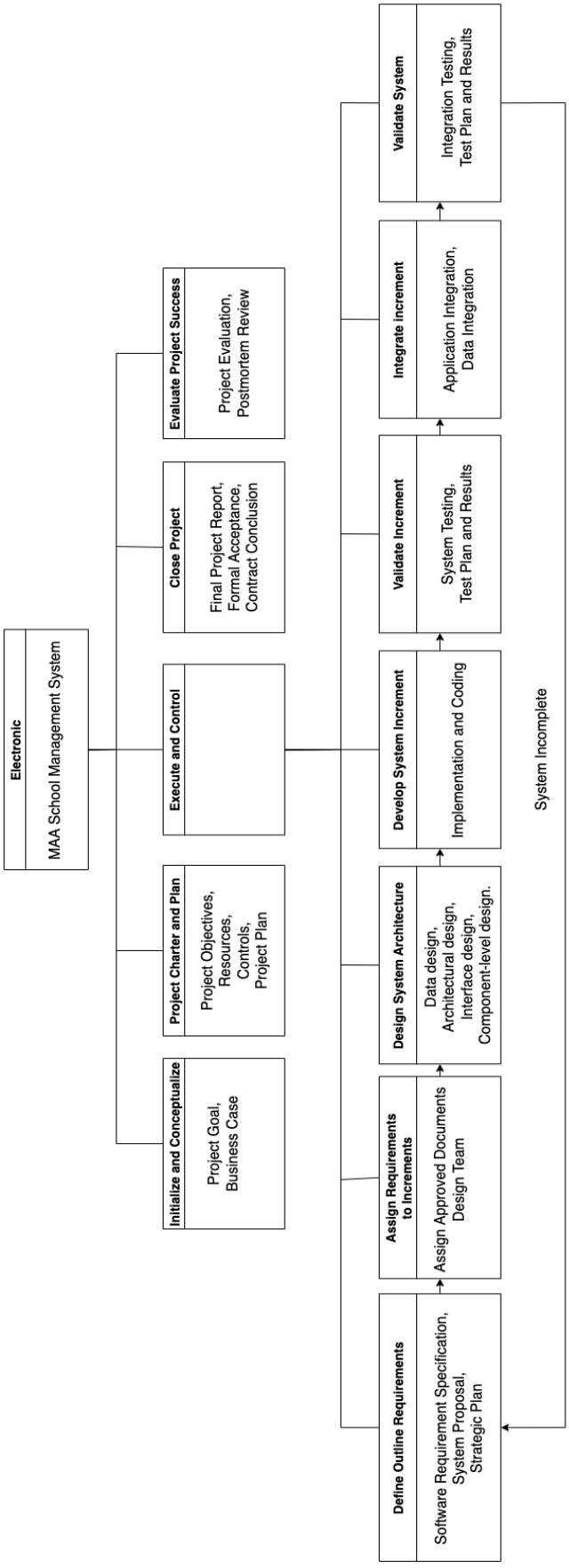

Fig 1: Deliverable Structure Chart (DSC)

Question 2:

A use case diagram (UCD)—A UCD defines the high-level features and functionality that the application system should include. Although Figure 5.5 provides an example of a use case, you can build one:

a. Draw a box to represent the system boundary.

b. Draw stick figures to represent the actors of the system. Actors can be users, managers, customers, or even other systems that will interact with or use the application system. Actors should be drawn on the outside of the system boundary. Be sure to label each actor with a descriptive name to describe the actor's role.

c. Draw an oval inside the system boundary for each function and label the oval with a descriptive name. A use case is a particular function that the application system will perform. Examples of use cases are update customer information, print employee overtime report, create new vendor record, and so forth. This important step during your project necessitates a great deal of interaction with your client. Unfortunately, you will not have access to a real client, so you can be creative. Keep in mind, however, that additional (and often unused) functionality will require more time and resources to build the system, thus adding to the project's schedule and budget. You and your team need to be aware that any features and functionality of the system should help the organization achieve its MOV.

d. Draw a connecting line to identify the actors who will make use of a particular use case.

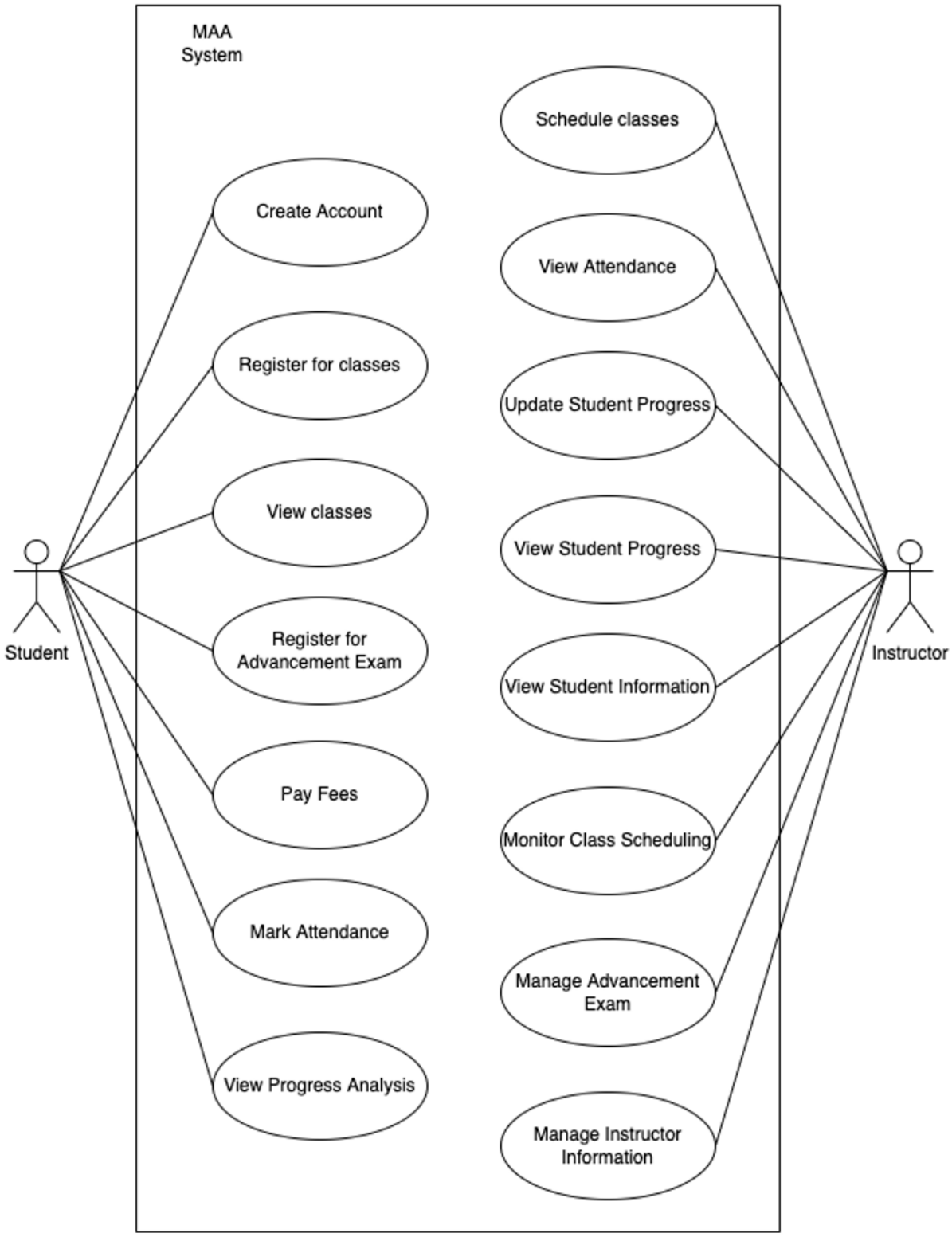

Fig 2: MAA User Case Diagram

Use case name: Create Account
Summary: The Interested students, to join the academy, should be able to register their account.

Use case name: Register for Classes
Summary: The registered students can view their classes which they have opted to attend to. book their next classes according to their own availability.

Use case name: View Classes
Summary: The registered students can book their next classes which they would like to attend according to their own availability.

Use case name: Register for Advancement Exam
Summary: The Students would be able to Register for an advancement exam after they complete a certain amount of hour required for each advancement exam level.

Use case name: Pay Fees
Summary: The Students can pay their class registration fee and pay their Advancement Exam fee when they register for it (if eligible).

Use case name: Mark Attendance
Summary: The Students can mark their attendance via the ID card punching machine at the entrance of the class. If They have scheduled their class then it would be marked as present for that day, and if scheduled the class and could not turn up they can reschedule their class.

Use case name: View Progress Analysis
Summary: The Students can view their own progress and analysis given by the instructor about classes and Exam (if any).

Use case name: Schedule Classes
Summary: The Instructor would schedule classes when and at what time the classes would be practised. Also, the type of classes would be decided by the instructor.

Use case name: View Attendance
Summary: The Instructor would be able to view the attendance of a particular student or for the class.

Use case name: View Student Progress
Summary: The Instructor would be able to view the progress of the student ranks (Orange, Yellow, Green, Blue, Purple, Brown, and Black ranks).

Use case name: Update Student Progress
Summary: The Instructor would be able to update the progress of the student ranks (Orange, Yellow, Green, Blue, Purple, Brown, and Black ranks).

Use case name: View Student Information
Summary: The Instructor would be able to view the information of the registered students.

Use case name: Monitor Class Scheduling
Summary: Update ..

Use case name: Manage Advancement Exam
Summary: The Instructor would be deciding on the Advancement Test classes when and at what time and the instructor who would be taking the Exam or in the Presence of the Instructor.

Use case name: Manage Instructor Information
Summary: The Instructor can be able to edit their Information and decide their availability to take classes.

Question 3:

Convert your deliverable structure chart (DSC) to a WBS. Using Microsoft Project®, create a work breakdown structure (WBS) by listing all the project life cycle and systems development life cycle phases and the associated deliverables that you defined in the DSC. Be sure to work through the MPS tutorial first. Also, be sure to follow the work package concept shown in Figures 5.8 and 5.9. Your WBS should include:

a. Milestones for each phase and deliverable—Achieving a milestone will tell everyone associated with the project that the phase or deliverable was completed satisfactorily.

b. Activities/Tasks—Define a set of activities or tasks that must be completed to produce each deliverable.

c. Resource Assignments—Assign people and other appropriate resources to each activity. This will be based on the people and resources that you identified when you completed the project infrastructure assignment from the previous chapter. Keep in mind that adding resources to an activity may allow the activity to be completed in a shorter amount of time; however, it may increase the cost of completing that task or activity.

d. Estimates for Each Activity/Task—Based on the tasks or activities and the resources assigned, develop a time estimate for each task or activity to be completed. For the purposes of this assignment, you should use a combination of estimation techniques such as time-boxing and bottom-up estimation.

Table 7: Work Breakdown Structure (WBS)

Task Name	Duration (days)	Start Date	End Date	Resource Assignment
Martial Arts Academy System	**140**			
1. Initialize and Conceptualize Project	**14**			
1.1 Develop Business Case	2	1-Aug-22	2-Aug-22	Business Analyst, Sponsor | Communications | Technology
1.2 Develop Project Description	4	3-Aug-22	6-Aug-22	Business Analyst, Sponsor | Communications | Technology
1.3 Determine requirements for the project	5	7-Aug-22	11-Aug-22	Business Analyst, Sponsor | Communications | Technology
1.4 Develop MOV	3	12-Aug-22	14-Aug-22	Business Analyst, Sponsor | Communications | Technology
Milestone: *Conceptualize and initialize project completed*				
2. Project Charter and Plan	**13**			
2.1 Determine Project Infrastructure	5	15-Aug-22	19-Aug-22	Sponsor, Stakeholder, Project Manager | Communications | Technology | Other Utilities
2.2 Determine Resources required	3	20-Aug-22	22-Aug-22	Sponsor, Stakeholder, Project Manager | Communications | Technology | Other Utilities
2.3 Develop Scope Management Plan	4	23-Aug-22	26-Aug-22	Sponsor, Stakeholder, Project Manager | Communications | Technology | Other Utilities
2.4 Review Project Plan and Project Charter/ Kickoff Meeting	1	27-Sep-22	27-Sep-22	Sponsor, Stakeholder, Project Manager | Communications | Technology | Other Utilities
Milestone: Project plan completed				
3. Execute and Control -	**8**			
3.1 Define Outline Requirements				
3.1.1 Design Software Requirement Specifications	3	28-Aug-22	30-Aug-22	Project manager, Project Team| Communications | Technology | Other Utilities

3.1.2 Design System Proposal	2	31-Aug-22	1-Sep-22	Project manager, Project Team| Communications | Technology | Other Utilities
3.1.3 Prepare System Strategic Plan	3	2-Sep-22	4-Sep-22	Project manager, Project Team| Communications | Technology | Other Utilities
Milestone: *Software Requirements Specification Document*				
3.2 Assign Requirements to Increments	**3**			
3.2.1 Assign Approved Increments	2	5-Sep-22	6-Sep-22	Project manager, Project Team | Communications |Other Utilities | Technology
3.2.2 Assign task to Team	1	7-Sep-22	7-Sep-22	Project Manager | Communications |Other Utilities | Technology
Milestone: *Finalize the Requirements for Incremental development plan*				
3.3 Design System Architecture	**13**			
3.3.1 Data design	3	8-Sep-22	10-Sep-22	Project Team | Communications |Other Utilities | Technology
3.3.2 Architectural design	4	11-Sep-22	14-Sep-22	Project Team | Communications |Other Utilities | Technology
3.3.3 Interface design	3	15-Sep-22	17-Sep-22	Project Team | Communications |Other Utilities | Technology
3.3.4 Component-level design	3	18-Sep-22	20-Sep-22	Project Team | Communications |Other Utilities | Technology
Milestone: *System Design completed/approved*				Project manager, Project Team
3.4 Develop System Increment	**40**			
3.4.1 Implementation and Coding	40	21-Sep-22	1-Nov-22	Project Team | Communications |Other Utilities | Technology
Milestone: *System implementation completed*				

3.5 Validate Increment	**17**			
3.5.1 System Testing	15	2-Nov-22	16-Nov-22	Project Team | Sponsor Communications |Other Utilities | Technology
3.5.2 Test Plan and Results	2	17-Nov-22	18-Nov-22	Project Team | Sponsor Communications |Other Utilities | Technology
Milestone: *Test results sign off*				
3.6 Integrate increment	**16**			
3.6.1 Application Integration	8	19-Nov-22	26-Nov-22	Project Team | Sponsor Communications |Other Utilities | Technology | Training | Maintenance and Support
3.6.2 Data Integration	8	26-Nov-22	3-Dec-22	Project Team | Sponsor Communications |Other Utilities | Technology | Training | Maintenance and Support
Milestone: *Application integrated*				
3.7 Validate System	**4**			
3.7.1 Integration Testing	3	4-Dec-22	6-Dec-22	Project Team | Sponsor Communications |Other Utilities | Technology | Training | Maintenance and Support
3.7.2 Test Plan and Results	1	7-Dec-22	7-Dec-22	Project Team | Sponsor Communications |Other Utilities | Technology
Milestone: *System validation completed*				
4. Close Project	**7**			
4.1 Prepare Final Project Report	2	8-Dec-22	9-Dec-22	Project Manager, Project Team | Communications | Technology | Other Utilities
4.2 Formal Acceptance	2	10-Dec-22	11-Dec-22	Sponsor, Stakeholder, Project manager | Communications | Technology | Other Utilities
4.3 Documentation release	1	12-Dec-22	12-Dec-22	Project Manager, Project Team | Communications | Technology | Other Utilities

4.4 Close Contract	2	13-Dec-22	14-Dec-22	Sponsor, Stakeholders, Project Manager, Project Team | Communications | Technology | Other Utilities
Milestone: *MAA project closure*				
5. Evaluate Project Success	**5**			
5.1 Conduct Project evaluation	3	15-Dec-22	17-Dec-22	Business Analyst, Stakeholders, Sponsor, Project Manager | Communications | Technology | Other Utilities
5.2 Determine if project meets MOV	2	18-Dec-22	19-Dec-22	Business Analyst, Stakeholders, Sponsor, Project Manager Communications | Technology | Other Utilities
Milestone: *MAA Project completed*				
Start Date of the Project		**1-Aug-22**		
End Date of the Project		**19-Dec-22**		
Total Days to complete the project		**140 Days**		

Question 4:

A detailed project plans.
a. 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.
b. 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).

Table 8: Activities for Activity on Node

Activity	Task Name	Estimated Duration (Days)	Predecessor
1	Business Case	2	None
2	Project Description	4	1
3	Determine requirements for the project	5	2
4	Develop MOV	3	3
5	Project Infrastructure	5	4
6	Resources required	3	4
7	Scope Management Plan	4	4
8	Review Project Plan	1	5,6,7
9	Design Software Requirement Specifications	3	8
10	System Proposal	2	9
11	Strategic Plan	3	10
12	Assign Approved Documents	2	11
13	Assign task to Team	1	11
14	Data design	3	12,13
15	Architectural design	4	12,13
16	Interface design	3	15
17	Component-level design	3	16
18	Implementation and Coding	40	17
19	System Testing	15	18
20	Test Plan and Results	2	19
21	Application Integration	8	20
22	Data Integration	8	21
23	Integration Testing	3	22
24	Test Plan and Results	1	23
25	Final Project Report	2	24
26	Formal Acceptance	2	24
27	Documentation release	1	25,26
28	Close Contract	2	27
29	Conduct Project evaluation	3	28
30	Determine if project meets MOV	2	29

(Looking at the AON network)

Start-to-start:

When two tasks can or must begin at the same time, a start-to-start link between those tasks or activities is present. The jobs can have varied durations even though they begin at the same moment and must end at the same time.

Task 4 to Task 5, 6, 7
Task 12 to Task 14, 15
Task 13 to Task 14, 15
Task 24 to Task 25, 26

Finish-to-Finish:

The finish-to-finish interaction is another kind of parallel activity. In this case, two events are scheduled to begin at the same time but may start at separate times and last for different amounts of time. When the two FF activities are finished, the next activity or set of activities can be started, or the project is finished if no other activities are required.

Task 5, 6, 7 to Task 8
Task 14, 15 to Task 16
Task 25, 26 to Task 27

AON Diagram -

- AON represents Tasks and Logical Sequence of tasks which consider estimated time of tasks, predecessor, successor and some parallel tasks.
- Total 30 Activities - 9 parallel activities and rest are sequential activities.

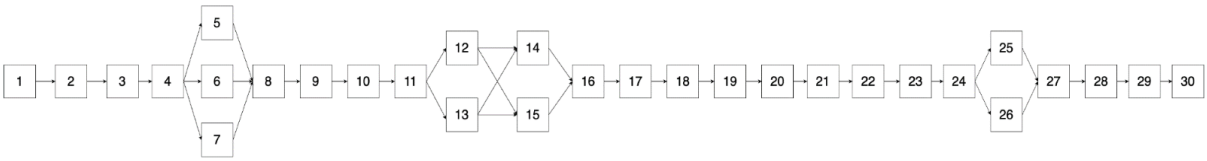

Fig 3: AON Diagram

Possible Paths Through the Network Diagram -

Table 9: Possible Paths Through the network Diagram

Possible Paths	Path	Total
Path 1	1+2+3+4+5+8+9+10+11+12+14+16+17+18+19+20+21+22+23+24+25+27+28+29+30	**126**
	2+4+5+3+5+1+3+2+3+2+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	
Path 2	1+2+3+4+8+9+10+11+12+14+16+17+18+19+20+21+22+23+24+25+27+28+29+30	**124**
	2+4+5+3+++1+3+2+3+2++3++3+3+40+15+2+8+8+3+1+2++1+2+3+2	
Path 3	1+2+3+4+7+8+9+10+11+12+14+16+17+18+19+20+21+22+23+24+25+27+28+29+30	**125**
	2+4+5+3+4+1+3+2+3+2+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	
Path 4	1+2+3+4+5+8+9+10+11+13+14+16+17+18+19+20+21+22+23+24+25+27+28+29+30	**125**
	2+4+5+3+5+1+3+2+3+1+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	
Path 5	1+2+3+4+8+9+10+11+13+14+16+17+18+19+20+21+22+23+24+25+27+28+29+30	**123**

	2+4+5+3+1+3+2+3+1+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	
Path 6	1+2+3+4+7+8+9+10+11+13+14+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+4+1+3+2+3+1+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**124**
Path 7	1+2+3+4+5+8+9+10+11+12+15+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+5+1+3+2+3+2+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**127***
Path 8	1+2+3+4+8+9+10+11+12+15+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+1+3+2+3+2+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**125**
Path 9	1+2+3+4+7+8+9+10+11+12+15+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+4+1+3+2+3+2+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**126**
Path 10	1+2+3+4+7+8+9+10+11+12+15+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+4+1+3+2+3+2+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**126**
Path 11	1+2+3+4+5+8+9+10+11+13+15+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+5+1+3+2+3+1+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**126**
Path 12	1+2+3+4+8+9+10+11+13+15+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+1+3+2+3+1+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**124**
Path 13	1+2+3+4+7+8+9+10+11+13+15+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+4+1+3+2+3+1+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**125**
Path 14	1+2+3+4+5+8+9+10+11+12+14+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+5+1+3+2+3+2+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**126**
Path 15	1+2+3+4+8+9+10+11+12+14+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+1+3+2+3+2+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**124**
Path 16	1+2+3+4+7+8+9+10+11+12+14+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+4+1+3+2+3+2+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**125**
Path 17	1+2+3+4+8+9+10+11+13+14+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+1+3+2+3+1+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**123**
Path 18	1+2+3+4+5+8+9+10+11+12+15+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+5+1+3+2+3+2+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**127***
Path 19	1+2+3+4+8+9+10+11+13+15+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+1+3+2+3+1+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**124**
Path 20	1+2+3+4+5+8+9+10+11+13+15+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+5+1+3+2+3+1+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**126**
Path 21	1+2+3+4+8+9+10+11+12+15+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+1+3+2+3+2+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**125**
Path 22	1+2+3+4+7+8+9+10+11+13+14+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+4+1+3+2+3+1+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**124**
Path 23	1+2+3+4+5+8+9+10+11+13+14+16+17+18+19+20+21+22+23+24+26+27+28+29+30 2+4+5+3+5+1+3+2+3+1+3+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**125**
Path 24	1+2+3+4+7+8+9+10+11+13+15+16+17+18+19+20+21+22+23+24+25+27+28+29+30 2+4+5+3+4+1+3+2+3+1+4+3+3+40+15+2+8+8+3+1+2+1+2+3+2	**125**

Question 5:

a. What are the beginning and end dates for your project? How many days will it take to complete the project?

Start Date of the Project	1-Aug-22
End Date of the Project	19-Dec-22
Total Days to complete the project	140days

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

- Path 7 and Path 18 are the Critical paths of our project. (127 Days).
- Our project has multiple critical paths. These are the longest paths in the project network and the shortest time in which the project can be completed.

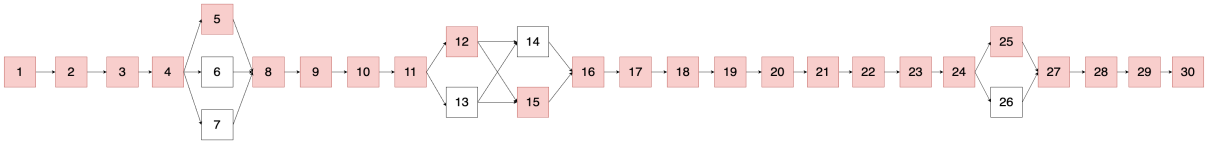

Fig 4: Critical Path in AON

The critical path is important because it helps project managers and team members identify the tasks that do not allow for any flexibility in timing. While some project tasks have a certain amount of "float", meaning that they can be delayed or extended without affecting the overall project timeline, tasks on the critical path have zero float. Any delay in a critical path task will result in a delay in the final deliverable unless future tasks can be modified so that they consume less time than initially planned.

Project Part 4

Question 1:

A project risk analysis and plan.

a. **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.**

- It is not always easy to locate and comprehend the risks that will affect a project. Several risks can have an impact on a project in various ways and at various stages of the project life cycle. As a result, the methods and procedures used to identify risks must take a comprehensive view of the project and make an effort to comprehend the causes and effects of a given risk on the different project components.
- It contains 7 layers –
    - MOV
    - Project Objective
    - Source of Project Risk
    - Type of Risk
    - Known/Unknown Risk
    - Project Life Cycle Phases

Table 10: Risk Identification

Project Phase	Conceptualize and initialize	Design Project Charter and Plan	Execute and Control	Close Project	Evaluate Project
Reason	Legal Action	Insufficient Funding	Drastic Technology Change	Client rejected Project Deliverables	Project Metric is not met
Type Of Risk (Known Risk, Known-Unknown Risk, Unknown-Unknown Risk)	Unknown-Unknown Risk	Unknown-Unknown Risk	Known-Unknown Risk	Known-Unknown Risk	Known-Unknown Risk
Type of Source for the Project Risk (Internal/External)	External	External Risk	Internal	Internal	External
Sources of the Risk (People, Legal, Process, Environment, Technology, Organization, Product, Other)	People, Legal, Product, Organization	People, Environment, Organization	Technology, People, Product	People, Organization, Process	Product, People
Project Objectives (Scope, Schedule, Budget, Quality)	Scope, Schedule, and Budget	Scope, Schedule, Quality and Budget	Quality, Schedule, Budget	Scope, Budget, Schedule	Scope, Schedule, Quality, Budget
MOV (Need to revise)	Scope needs to be modified	Need to rework on finance module	N/A	Need to work on operational, customer module	Need to upgrade on operational, customer module
Owner	Business Analyst	Stakeholder	Project Manager	Project Manager	Business analyst, Project Manager
Suggested Strategy	Management reserves, Mitigate	Contingency reserves, Mitigate	Contingency Plans	Mitigate, Avoidance	Accept or ignore
Strategy Description	Ensure that there are management resource reserves to provide a cushion for the project for unexpected situations like legal actions.	Ensure that there are contingency reserves ingrained within the initial project budget just for situations where funds become insufficient.	We can make sure that we have other software alternatives available. For example, an alternative to Zoho CRM could be Amazon.	Ensure that the client requirements are followed to specification and that the project sponsor accepts each integrated increment during development before moving	We can be very hopeful that this risk will not occur given that we are considering the project requirements and metrics in the development. In the case that it does, it could be due to other factors.

				on to the next increment.	

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

Table 11: Risk Strategy

Project Phase	**Conceptualize and initialize**	**Design Project Charter and Plan**	**Execute and Control**	**Close Project**	**Evaluate Project**
Reason	Legal Action	Insufficient Funding	Drastic Technology Change	Client rejected Project Deliverables	Project Metric is not met
Ownership of the Risk	Business Analyst	Stakeholder	Project Manager	Project Manager	Business analyst, Project Manager
Suggested Strategy	Management reserves, Mitigate	Contingency reserves	Contingency Plans	Mitigate	Accept or ignore

Risk Management –

1. Mitigate
2. Management reserves
3. Contingency reserves
4. Contingency plans
5. Accept or ignore