Project Plan

Activites	No.Of Weeks	Plan/ Actual	October				November				December				January				February				March				April				May				June		
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3
Problem Identification and Literature Survey	6W	Plan																																			
		Actual																																			
Software Requriments and Specifications	3W	Plan																																			
		Actual																																			
Architecture, Design and Prototype	4W	Plan																																			
		Actual																																			
Implementation	10W	Plan																																			
		Actual																																			
Testing and Validation	3W	Plan																																			
		Actual																																			
Project Closure - **Results Observations -Demonstration -Report Writing**	3W	Plan																																			
		Actual																																			

PLAN
ACTUAL

Cost Estimation

A cost estimate is an approximation of the cost of a program, project or operation. In this project, most of the work is done using open-source software.

Why Cost Estimation?

- Cost estimations are prepared to different ends throughout the project lifecycle.
- The goal is to provide input for investment decisions.
- Cost estimation is used to determine the size of the required investment to create or modify assets.
- The cost estimate is a deliverable that serves the decision-making process at each phase of the project lifecycle.

Elements of Cost Estimation in Project Management:

There are two types of cost estimation:

1. Direct Cost: The direct cost in project management is an explicit cost incurred or spent on a project. Direct costs are easily identifiable in a project because they are directly involved with every level of activity in a project. This includes materials, equipment and other resources.
2. Indirect Cost: Indirect costs in project management include all the implicit costs of a project. They are also known as overhead costs or burden costs. They are support costs not directly involved with a project's operations. They include costs such as rent on equipment, office supplies, etc.

The following are some facets of cost estimation that we have taken into consideration:

- Labour: The labour cost for the project is the amount of time we have spent working on its development. We divided the entire project equally amongst ourselves devoting 7 – 10 hours a week for the entire duration of the Major Project course work.
- Materials and equipment: This is the cost of the resources required for the project from physical tools to software licences. We have made an effort to use open-source tools wherever possible to reduce the software license cost overhead. There are no hardware components involved in the project.
- Miscellaneous costs: Other incidental costs include travel expenses, expenses towards draft reports etc.

The table below lists the primary expenses incurred towards the complete project:

Sl. No.	Particulars	Description	Cost
1	Google cloud	For hosting the Docker containers	₹ 5000 p.m
2	Google cloud registry	To save and manage the Docker images	₹ 1000 p.m
3	Game Assets	Various assets required for the game like background music, player skins, weapons etc.	₹ 3000
4	Courses	Courses required for learning the tools and technologies	₹ 3000
5	Miscellaneous	Costs for preparing project reports, stationary requirements, travel, etc	₹ 5000
6	Internet Charges	Cost towards internet	₹ 5000
Total			₹ 22, 000

PO ATTAINMENT

Programme Outcomes (POs):		Task Preformed	Attainment				
			Excellent 5	Very Good 4	Good 3	Fair 2	Poor 1
PO1	Engineering knowledge	1. Applied the knowledge of Computer Networks, Programming, Cloud Technologies and Software Engineering.	✓				
PO2	Problem analysis	1. Literature Survey was done on existing works related to cloud gaming and multiplayer games. 2. The objectives of the project were set. 3. Knowledge of Computer Networks, Programming, Cloud Technologies and Software Engineering were found to be useful in implementing the project		✓			
PO3	Design/development of solutions	1. Solution was developed for the following problem statement: Developing “An online scalable low latency multiplayer game using docker”. 2. We containerized the game server to reduce latency and to achieve scalability.		✓			
PO4	Conduct investigations of complex problems	1. Requirements for the project was gathered through Literature Survey. 2. Analysed various available frameworks and technologies relevant to the project. 3. We studied various existing multiplayer games and considered various features to add to the project			✓		

PO5	Modern tool usage	1. Visual studio code, Docker Desktop, BurpSuite, NodeJS, MongoDB, Express	✓				
PO6	The engineer and society	1. Through this project we have developed a Proof of Concept for scalable, low latency multiplayer games, which can be enhanced by the gaming industry for creating a better gaming experience for users across the globe.			✓		
PO7	Environment and sustainability	1. We have considered a cloud native architecture for the project making it highly available and sustainable.			✓		
PO8	Ethics	1. References are quoted. 2. We purchased game assets and required software licenses legally. 3. Report is prepared by students and plagiarism check is made with Turnitin software.	✓				
PO9	Individual and team work	1. Each student took up the responsibility of developing different modules of the project. 2. The report content was contributed by each of the team members. 3. Integration of the modules was done as a team. 4. Incorporating the suggested changes was done as a team. 5. Presentations and project demos were given as a team.		✓			
PO10	Communication	1. Phase-wise presentation and Demo of progress of the project were shown to the panel and industry experts. 2. Regular interaction with Guide and Panel members to incorporate the suggestions given during evaluations 3. Answering queries during presentations and demos.	✓				

PO11	Project management and finance	1. Project Scheduling using Gantt Chart. 2. Maintaining Project Diary. 3. Budgeting and cost estimation. 4. Estimating man hour Requirements.		✓			
PO12	Life-long learning	1. Working of online multiplayer games. 2. Making the existing and upcoming games scalable. 3. Making use of cloud technologies where time and latency can be optimised.		✓			

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