EAST WEST UNIVERSITY

Project Report

Course Code and Name: **CSE495** **IT Project Management and Entrepreneurship**
Project Title: Enhancement of Healthcare Services

Semester and Year: Summer-2024	**Section:** 02
Student's information: Ayon Sen (2019-3-60-125) Mujahidul Islam (2020-2-60-190) Saurov Sikder (2021-1-60-053) Anindita Sutradhar (2022-1-50-007)	**Course Instructor Information:** Dipayan Bhadra (Adjunct Faculty) Department of CSE East West University

Date of Submission: 21st September 2024

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Introduction:

With real-time insights for informed care decisions, patients and clinicians are empowered by the Medi-Care project, a healthcare platform. It provides early health risk detection, tailored suggestions, and smooth communication through predictive analytics and remote monitoring. Using a mobile and web-based platform, Medi-treatment aims to change healthcare delivery by providing equitable, patient-centric treatment in underserved and rural parts of Bangladesh.

Objective & Features:

The HealthInsight landscape faces challenges, including limited access to information and resources, particularly in rural areas. This can lead to disparities in care, hinder proactive health management, and create inefficiencies within the system. To address these issues, we propose the development of a comprehensive web and mobile platform, the HealthInsight platform.

This platform aims to revolutionize healthcare access and empower Bangladeshi patients by:

- Develop a comprehensive web and mobile platform for delivering real-time healthcare insights to patients in Bangladesh.
- Empower patients to make informed decisions about their healthcare by providing timely and relevant data.
- Enhance patient-centric care through transparency and collaboration between healthcare providers and patients.
- Improve healthcare outcomes by leveraging data-driven insights to optimize treatment plans and delivery.
- Promote preventive care and early intervention by providing personalized health information and recommendations.

Features:

1. **Real-Time Healthcare Insights**
    - **Description**: The platform delivers real-time data on patient health, enabling immediate and informed care decisions.
    - **Stakeholder/Team**: Full Stack Development, Database Engineer, Development Leader
    - **Objective**: Provide timely, useful health information to individuals and healthcare professionals.
2. **Predictive Analytics for Early Health Risk Detection**
    - **Description**: Makes use of data-driven insights to forecast possible health hazards, guaranteeing early identification and treatment.
    - **Stakeholder/Team**: Data & Financial Analyst, QA Engineers
    - **Objective**: By recognizing risks before they develop into significant illnesses, you can improve preventative care.
3. **Remote Monitoring**
    - **Description**: Allows medical professionals to keep an eye on patients' health from a distance and provide care without requiring in-person visits.
    - **Stakeholder/Team**: Full Stack Developer, IT Support, Medical Providers
    - **Objective**: Ensure continuous healthcare access, especially in rural and underserved areas.
4. **Personalized Health Recommendations**
    - **Description**: The system provides tailored health advice based on individual patient data.
    - **Stakeholder/Team**: Data & Financial Analyst, UI/UX Designer
    - **Objective**: Deliver personalized care to improve outcomes and patient satisfaction.
5. **Seamless Communication Between Patients and Providers**
    - **Description**: Enables clear and easy communication using the platform's notification and messaging features.
    - **Stakeholder/Team**: Full Stack Developer, IT Support, Medical Providers
    - **Objective**: Enhance teamwork and patient-centered treatment by implementing feedback loops and real-time information.
6. **User-Friendly Interface for Both Web and Mobile**
    - **Description**: The platform ensures ease of use for patients and clinicians through an intuitive UI/UX.
    - **Stakeholder/Team**: UI/UX Designer, Development Leader

- **Objective**: Increase adoption and reduce barriers to accessing health insights by simplifying navigation and interactions.

7. **Data Security and Privacy**
   - **Description**: Implements encryption, secure user authentication, and compliance with healthcare data protection standards.
   - **Stakeholder/Team**: IT Security Team, Legal Counsel, Database Engineer
   - **Objective**: Protect patient confidentiality and ensure data integrity in compliance with legal regulations.
8. **Integration with Existing Healthcare Systems**
   - **Description**: Ensures compatibility with other healthcare providers' tools and databases for seamless data sharing.
   - **Stakeholder/Team**: Development & QA Team, Database Engineer
   - **Objective**: Integrate external systems to maximize workflow efficiency and improve care coordination.

Resource Allocation:

1. Project Initiating:

1.1 Define Project Scope and Objectives: (Project Manager, Healthcare Specialist, Business Analyst)
1.2 Stakeholder Analysis: (Project Manager, Business Analyst, Healthcare Providers)
1.3 Project Charter: (Project Manager, Business Analyst, Project Sponsor, Financial Analyst)

2. Requirement Analysis:

2.1 Identify Healthcare and Technical Requirements: (Business Analyst, Project Manager, Healthcare Providers)
2.2 Conduct Patient and Provider Interviews: (Business Analyst, UX/UI Designer, Healthcare Providers, Patients)
2.3 Define Functional and Non-functional Requirements: (Business Analyst, System Architect)
2.4 Validation of Requirements with Stakeholders: (Business Analyst, Project Manager, Healthcare Providers, Patients)

3. Planning:

3.1 Analyze Budget Constraints: (Project Manager, Financial Analyst)
3.2 Establish Communication Channels: (Project Manager, Healthcare Providers)
3.3 Plan for Risk Management and Quality Assurance: (Project Manager, QA Engineers, Healthcare Providers)
3.4 Schedule Project Milestones: (Project Manager, Project Planner, System Architect)
3.5 Develop Work Breakdown Structure (WBS): (Project Manager, Project Planner)
3.6 Resource Planning for Healthcare and Tech Teams: (Project Manager, Resource Manager)
3.7 Configuration Management Strategy: (Configuration Manager, Developers)

4. System Architecture and Design:

4.1 Develop Healthcare Architecture Design: (System Architect, Full Stack Developers, Healthcare Specialist)
4.2 UI/UX Design for Web and Mobile Platforms: (UI/UX Designer)
4.3 Design Database for Patient and Health Records: (Database Engineer, System Architect)
4.4 Plan System Integration for Remote Monitoring: (System Architect, Integration Specialist)
4.5 Design for Predictive Analytics: (Data Scientist, Full Stack Developer)

5. Development:

5.1 Front-End Development for Mobile and Web: (Front-End Developers)
5.2 Back-End Development with Predictive Algorithms: (Back-End Developers, Data Scientist)
5.3 Integrate Real-Time Monitoring Features: (Developers, IT Support Specialist)
5.4 Unit Testing for Healthcare Data Accuracy: (QA Engineers, Developers)
5.5 Code Review for Security and Efficiency: (Developers, Security Engineer)

6. Testing:

6.1 Functional Testing on Healthcare Modules: (QA Engineers, Developers, Healthcare Providers)
6.2 Integration Testing with Remote Monitoring: (QA Engineers, IT Support Specialist)
6.3 User Acceptance Testing with Patients and Providers: (Business Analyst, Healthcare Providers, Patients)

7. Execution:

7.1 Buy and Set Up Servers for Real-Time Data Processing: (Procurement Director, IT Support Specialist)
7.2 Remote Monitoring Hardware Installation: (IT Support Specialist, Technicians)
7.3 Software Deployment for Web and Mobile Platforms: (Full Stack Developers, IT Support Specialist)

8. Support and Maintenance:

8.1 Address Patient and Provider Issues: (Helpdesk Support Analyst)
8.2 Monitor System and Network Performance: (IT Support Specialist)
8.3 Bug Fixing and Feature Updates: (Developers, QA Engineers)
8.4 Continuous Monitoring of Predictive Models: (Data Scientist, IT Support Specialist)

9. Deployment:

9.1 Hosting and Server Setup for Data Storage: (IT Support Specialist, Database Engineer)
9.2 Configure Mobile and Web Platforms for Patient Access = (Developers, IT Support Specialist)
9.3 User Training for Clinicians and Patients: (Trainers, Helpdesk Support Analyst)
9.4 Database Configuration for Patient Records: (Configuration Manager, Developer, IT Support Specialist)
9.5 Network Configuration for Remote Monitoring: (Configuration Manager, IT Support Specialist)

10. Closing:

10.1 Project Review and Feedback Collection: (Project Manager, Developers, QA Engineers, Healthcare Providers)
10.2 Final Report on Healthcare Outcomes and System Performance: (Project Manager, Business Analyst, Healthcare Providers)
10.3 Client and Stakeholder Sign-Off: (Project Manager, Project Sponsor, Healthcare Providers)
10.4 Project Handover and Final Closeout: (Project Manager, Developers, QA Engineers, IT Support Specialist, Healthcare Providers)

Project Charter:

A project charter is a crucial document that formally authorizes the existence of a project, and outlines its objectives, scope, stakeholders, and overall approach.

Here Is Our Project Charter:

<table>
<tr><th colspan="2">Project Charter</th></tr>
<tr><td colspan="2">Project Name: A platform to provide equitable access to real time healthcare insights and empower patient-centric care decisions.</td></tr>
<tr><td>Project Owner: Group 6</td><td>Decision Making Exec: Saurov Sikder</td></tr>
<tr><td>Project Sponsor: Dipayan Bhadra</td><td>Project Manager: Saurov Sikder</td></tr>
<tr><td>Customer: Educational Institution</td><td>Charter Date: 30 July 2024</td></tr>
<tr><td>Expected Start Date: 1st September 2024</td><td>Expected Completion Date: 1st September 2026</td></tr>
<tr><td colspan="2">Project Description:

Medi-care provides a platform for real-time, empowering patient-centric care decisions. It continuously analyzes health data, offering predictive analytics to detect potential issues early. The platform supports remote monitoring, enabling patients to receive timely care from anywhere, and facilitates seamless communication between patients and providers. By delivering personalized health information and focusing on inclusivity, it ensures equitable access to quality healthcare for diverse and underserved communities.</td></tr>
<tr><td colspan="2">Project Mission:

Our mission with the Medicare platform is to revolutionize healthcare access in Bangladesh by providing real-time insights via a web and mobile platform. We aim to empower patients with timely data for informed decisions, enhance care through improved transparency and collaboration, and optimize treatment outcomes</td></tr>
</table>

with data-driven insights. By focusing on preventive care and personalized recommendations, we seek to address healthcare disparities and inefficiencies, especially in rural and underserved areas.

Project Objectives:

- Develop a comprehensive web and mobile platform for delivering real-time healthcare insights to patients in Bangladesh.
- Empower patients to make informed decisions about their healthcare by providing time and relevant data.
- Enhance patient-centric care through transparency and collaboration between healthcare providers and patients.
- Improve healthcare outcomes by leveraging data-driven insights to optimize treatment plans and delivery.
- Promote preventive care and early intervention by providing personalized health information and recommendations.

Project Scope and Schedule:

KEY Activities and Milestones	Prerequisite	Duration of the Activity /Date of the Milestone
1. Project Initiating	—	0
2. Requirement Analysis	1	1
3. Planning	2	2
4. System Architecture	3	3
5. UI/UX Design	4	1
6. Database Engineering	3, 4	4

7. Full Stack Development	6	8
8. Testing	7	1
9. Bug Fixing	8	2
10. Deployment	9	1
11.Closing & Delivery	10	1

Project Resources and Cost:

COST TYPE	VENDOR / LABOR NAMES	RATE/D	QTY	Total	Year1	Year2
LABOR	1. Labor	1000	5	624000	312000	31200
	2. Technician	1000	2	624000	312000	312000
Materials	1. Server	77	2	48000	24000	24000
	2.Technical stack	674	4	210000	180000	30000
	3.Office rent & services	1500	1	1,092,000	540,000	562,000
Expert Services	1.Project Manager	3847	1	2400000	1200000	1200000
	2.Data & Financial Analyst	2693	1	1,680,000	840000	840000
	3. UI/UX Designer	1000	2	52000	52000	-
	5.Database Engineer	1,540	1	160,000	160,000	-
	6.Development Leader	1730	1	180,000	180,000	-
	7.Resource Manager	1,925	1	1,200,000	600,000	600,000
	8.QA Engineers	960	1	600,000	300,000	300,000
	9.Full Stack Developer	3461	3	2,160,000	1,080,000	1,080,000
	10.IT Support and Maintenance Specialist	3846	4	24,00,000	12,00,000	12,00,000
		2310	5	1,440,000	720,000	720,000

Consultants	Legal Counselor	1153	1	720000	360000	360000
MISCELLANEOUS						
		TOTAL COSTS (TK)		1,55,90,000	8060000	7,530,000

Project Benefits:

The project improves health outcomes by providing real-time insights and early detection, fostering enhanced patient engagement through easy data access, and supporting more efficient care with detailed information for clinicians. It promotes preventive care via predictive analytics, ensures broader accessibility by focusing on diversity, and increases convenience with remote monitoring and integrated communication tools.

Project Risks:

The Medi-Care project faces risks including data privacy breaches, technical challenges, and integration issues with existing systems. User adoption may be hampered by digital literacy and resistance to change, while regulatory compliance and data quality are critical. Financial sustainability, ethical concerns, scalability, and impact on providers also need careful management.

Project Stakeholders:

Patients, Healthcare Providers, Medical Corporation, Investors, Legal Advisors, Payers Insurance companies, Technical Staff

Critical Success Factors (Enablers):

Stakeholder engagement and support, Effective communication with end-users.

Constraints:

Budget limitations, timeline restrictions.

Assumptions:			
Availability of required technology and support, Availability of required resources (human, financial, technological), stakeholder commitment to project success, effective collaboration among project team members.			
Other Related Projects/Initiatives: (if any)			
Project Owner:	Group 6 15/08/2024	Project Manager:	Saurov Sikder 15/08/2024
	Signature & Date		*Signature and Date*

Stakeholder Analysis:

Stakeholder analysis for the "Develop A Student Management Software" project is essential to identify and understand the individuals or groups with a vested interest in the project. There are two types of stakeholders (internal and external).

Internal Stakeholder:

Stakeholders	Power Influence (1 to 5)	Current Support (1 to 5)	Calculated Rating	What do they need? What do they consider to be wins?	How will they engage their favorability/support?	Action	Lead	Due Date
Project Manager	4	4	16	Cost efficient and well planned	Involve stakeholders from the initial stages, interact sincerely, and control anticipations along with regular updates.	Regular updates and feedback sessions	Project Manager	Ongoing
Project Owner	5	5	25	Successful project within due date	Getting project updates frequently	Monthly progress reports, direct involvement	Project Owner	Ongoing
Developer Team	3	3	9	Full filling project requirements	Provide a team oriented surroundings	Communication among the developer team	Developer Leader	Ongoing
Database Engineer	3	3	9	Designing & implementing data schema	Clear requirements for database & regular feedback from development team	Involvement with developers on data and Software requirements	Database Engineer	Ongoing
QA Team	4	3	12	Ensuring product quality & minimizing defects	Early involvement in development, continuous testing	Regular bug reports and test updates	QA Leader	Ongoing

External Stakeholder:

Stakeholders	Power Influence (1 to 5)	Current Support (1 to 5)	Calculated Rating	What do they need? What do they consider to be wins?	How will they engage their favorability/support?	Action	Lead	Due Date
Patients	5	3	15	Improved health outcomes, personalized care, reduced costs	Direct surveys, focus groups, social media feedback	Develop patient-centered communication channels, offer educational resources	Patient Relations Manager	Ongoing
Healthcare Providers	4	4	16	Optimized efficiency, better patient outcomes, increased revenue	Professional associations, webinars, case studies	Offer training and support, participate in industry conferences	Medical Director	Ongoing
Medical Corporation	4	3	12	Increased market share, improved reputation, enhanced patient satisfaction	Partnership agreements, financial projections, legal review	Develop business case, explore partnerships	Business Development Manager	Ongoing
Investors	5	3	15	Sustainable growth, potential for high returns, positive social impact	Investor presentations, due diligence, financial modeling	Prepare comprehensive investor pitch deck, conduct due diligence	CFO	Ongoing
Legal Advisors	3	2	6	Adherence to healthcare laws, minimized legal risks, successful partnerships	Legal consultations, contract review, risk assessment	Engage legal counsel for ongoing guidance	Legal Counsel	Ongoing
Payers Insurance companies	3	2	6	Reduced healthcare costs, improved patient outcomes, enhanced risk management	Contract negotiations, data sharing agreements, performance metrics	Develop value-based contracting models, participate in industry forums	Payer Relations Manager	Ongoing

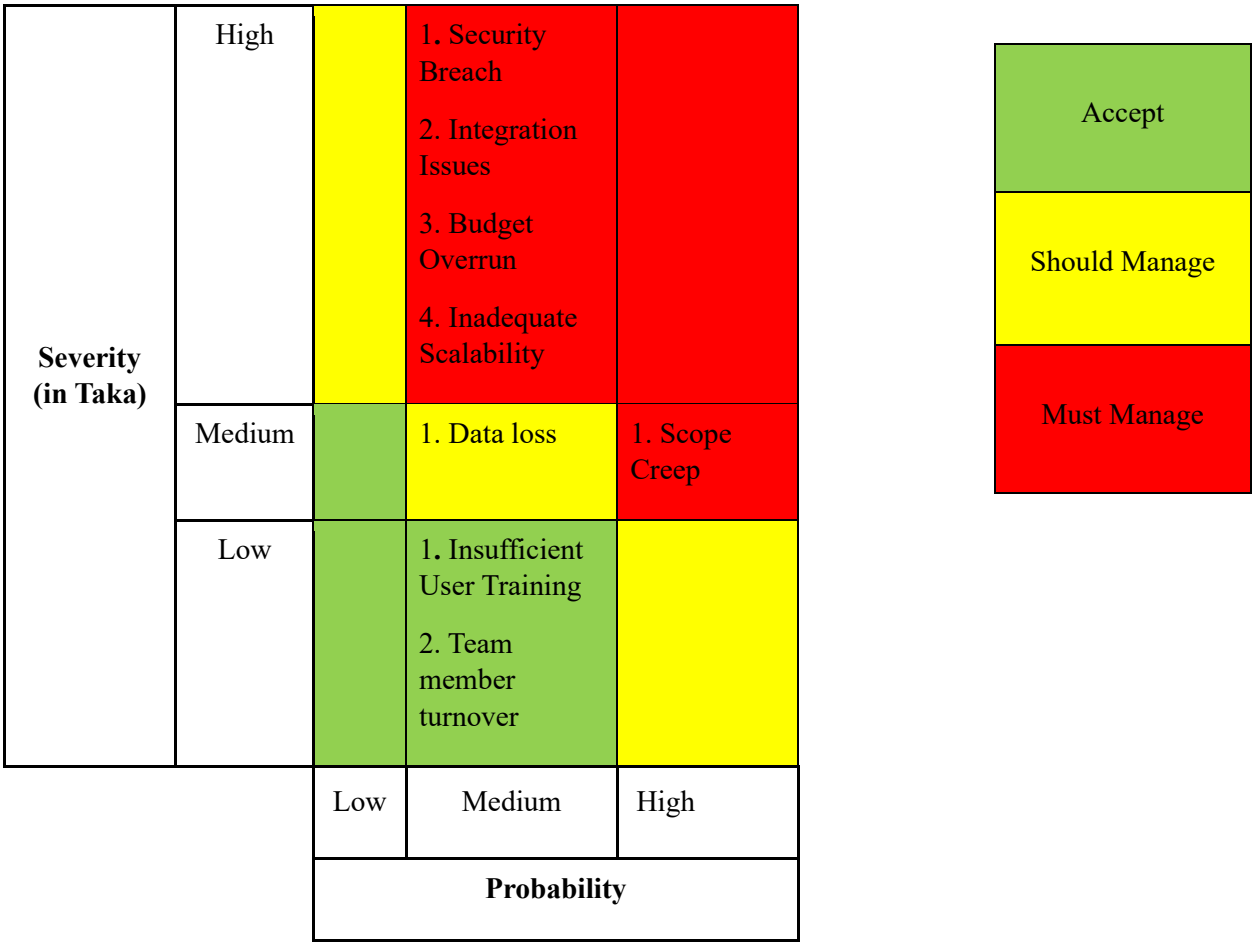
Power/Influence
1 = No power
2 = Some influence over project outcomes
3 = Moderate Influence
4 = Major influence on project
5 = Maximum influence

Current Support
1 = Active supporter
2 = Moderately positive
3 = Neutral
4 = Moderately negative
5 = Negative

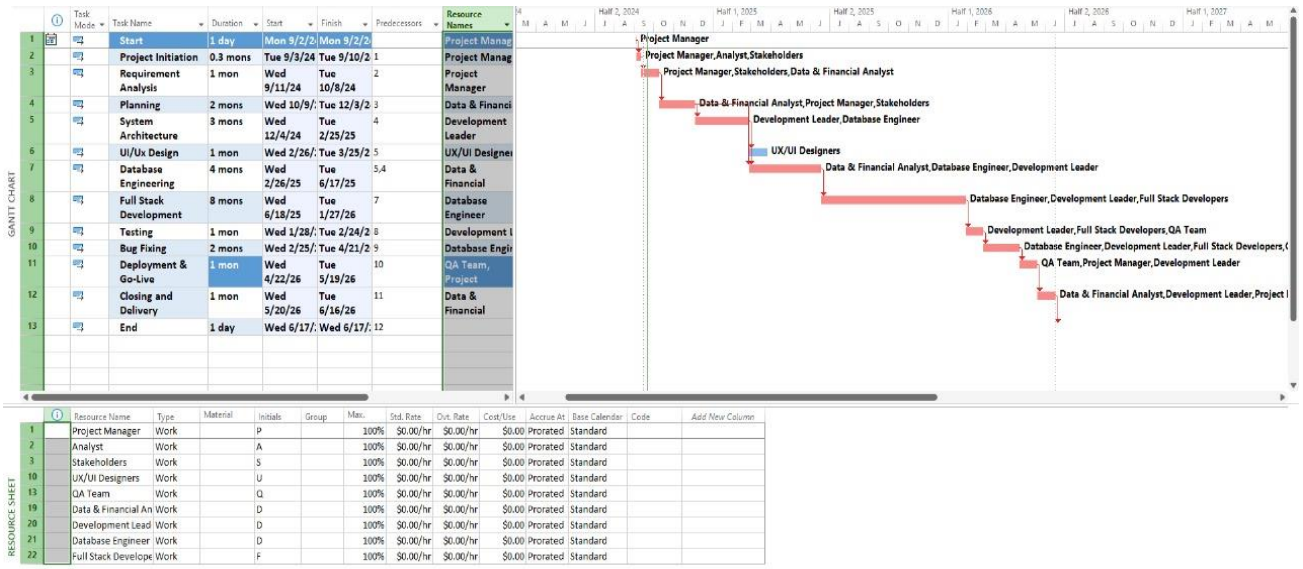
Risk Analysis:

Risk Event Description and Impact	***Impact***	***Probability H/M/L***	***Severity H/M/L***	***Mitigation Strategy***	***Who/When***
Data Loss or Corruption	Loss of patients' health records	M	M	Automated backups with version control	Database Engineer
Security Breach	Unauthorized access to patient confidential information	M	H	Implement robust user-authentication and Encryption protocols	IT Security Team/ Throughout development
Insufficient User Training	Users are not familiar with the system, leading to errors	M	L	Develop comprehensive user documentation and conduct training session	Project Manager/ Before the system Deployment
Integration Issues	Incompatibility with healthcare provider existing systems or tools	M	H	Conduct thorough compatibility testing with common tools and systems	Development & QA Team / During testing phase
Scope Creep	Constantly expanding project requirements	H	M	Clearly define and document project scope, obtain approval for any scope changes	Project Manager / Throughout development
Budget Overrun	Exceeding allocated budget for development	M	H	Weekly monitor project expenses, prioritize features based on budget constraint	Project Manager, Data & Financial Analyst / Ongoing
Slow performance		M	H	Conduct performance testing, optimize code and hardware resources	Development Team / During the testing phase

	Slow response times or system crashes				
Inadequate Scalability	The system unable to handle gradually increasing user base	M	H	Design for scalable architecture and monitoring and optimizing system performance	Development Team / During testing phase
Team member turnover	Key team members leaving the project unexpectedly	M	L	Cross-train team members, maintain comprehensive documentation	Project Manager / Ongoing



Gantt Chart:



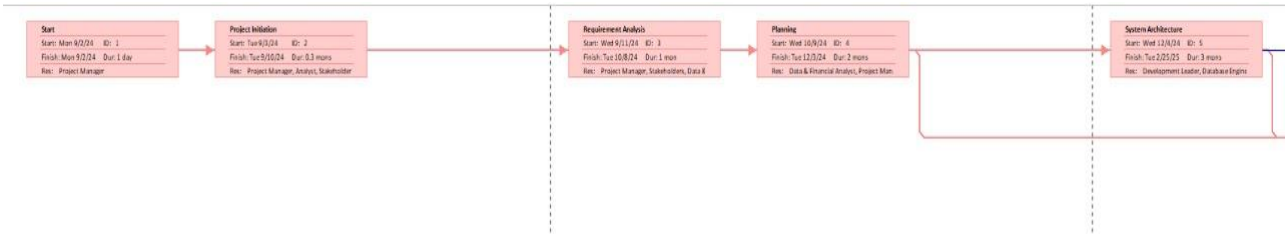
GANTT CHART

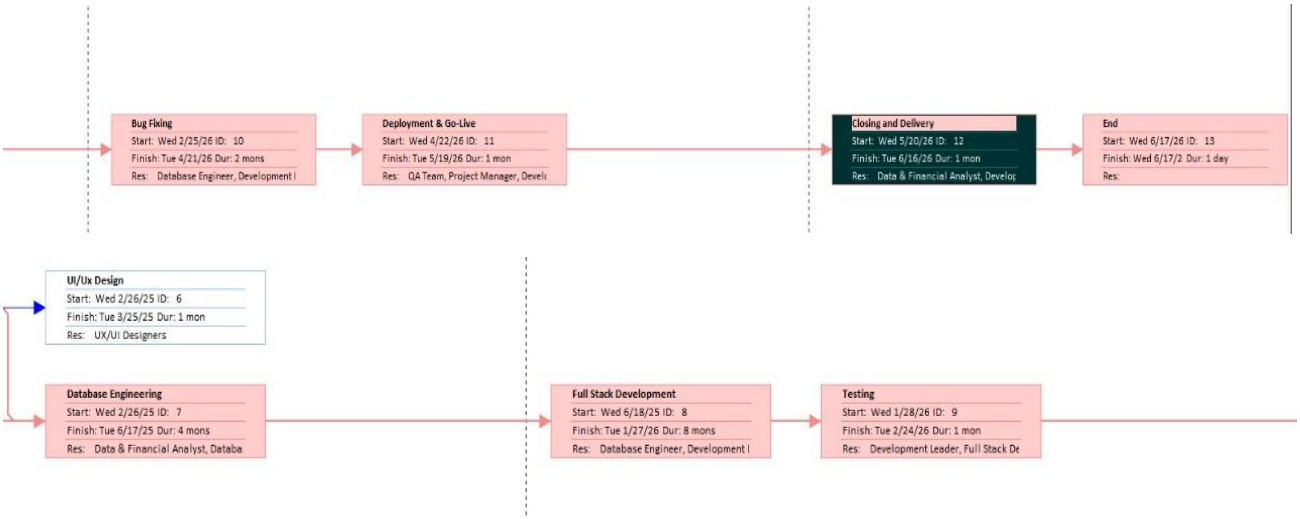
	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		Start	1 day	Mon 9/2/24	Mon 9/2/24		Project Manag
2		Project Initiation	0.3 mons	Tue 9/3/24	Tue 9/10/24	1	Project Manag
3		Requirement Analysis	1 mon	Wed 9/11/24	Tue 10/8/24	2	Project Manager
4		Planning	2 mons	Wed 10/9/24	Tue 12/3/24	3	Data & Financi
5		System Architecture	3 mons	Wed 12/4/24	Tue 2/25/25	4	Development Leader
6		UI/Ux Design	1 mon	Wed 2/26/25	Tue 3/25/25	5	UX/UI Designer
7		Database Engineering	4 mons	Wed 2/26/25	Tue 6/17/25	5,4	Data & Financial
8		Full Stack Development	8 mons	Wed 6/18/25	Tue 1/27/26	7	Database Engineer
9		Testing	1 mon	Wed 1/28/26	Tue 2/24/26	8	Development L
10		Bug Fixing	2 mons	Wed 2/25/26	Tue 4/21/26	9	Database Engi
11		Deployment & Go-Live	1 mon	Wed 4/22/26	Tue 5/19/26	10	QA Team, Project
12		Closing and Delivery	1 mon	Wed 5/20/26	Tue 6/16/26	11	Data & Financial
13		End	1 day	Wed 6/17/26	Wed 6/17/26	12	

RESOURCE SHEET

	Resource Name	Type	Material	Initials	Group	Max.	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base Calendar	Code	Add New Column
1	Project Manager	Work		P		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
2	Analyst	Work		A		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
3	Stakeholders	Work		S		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
10	UX/UI Designers	Work		U		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
13	QA Team	Work		Q		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
19	Data & Financial An	Work		D		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
20	Development Lead	Work		D		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
21	Database Engineer	Work		D		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		
22	Full Stack Develope	Work		F		100%	$0.00/hr	$0.00/hr	$0.00	Prorated	Standard		

Network Diagram:





Cost Benefit Analysis:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1		Year	MaintainanceCost	Cost	Final cost	Income	Benefit	DF	PV of Cost	PV of Income	Cashflow	C.CashFlow	D.CashFlow	C.D.CashFlow
2	0	2024		80,60,000	8060000		-8060000	1.00	8060000	0	-8060000	-8060000	-8060000	-8060000
3	1	2025		75,30,000	7,530,000		-7530000	0.91	6845455	0	-7530000	-15590000	-7171429	-15231429
4	2	2026	300000		300000	6000000	5700000	0.83	247934	4958678	5700000	-9890000	5170068	-10061361
5	3	2027	300000		300000	2000000	1700000	0.75	225394	1502630	1700000	-8190000	1468524	-8592837
6	4	2028	300000		300000	2000000	1700000	0.68	204904	1366027	1700000	-6490000	1398594	-7194242
7	5	2029	300000		300000	3000000	2700000	0.62	186276	1862764	2700000	-3790000	2115521	-5078722
8	6	2030	350000		350000	3000000	2650000	0.56	197566	1693422	2650000	-1140000	1977471	-3101251
9	7	2031	350000		350000	4000000	3650000	0.51	179605	2052632	3650000	2510000	2593987	-507264
10	8	2032	350000		350000	4000000	3650000	0.47	163278	1866030	3650000	6160000	2470464	1963200
11	9	2033	350000		350000	4000000	3650000	0.42	148434	1696390	3650000	9810000	2352823	4316022
12	Sum				18190000	28000000	9810000		16458846	16998572				
13														
14														
15			DF	10%										
16			Discount Rate	5%										
17														
18								NPV	539726.16		NPV1	539726.16		
19								BCR	1.03		NPV2	-66790.78		
20								IRR	11%		IRR	0.11		
21								PayBackPeriod	6.31					
22								D.PayBackPeriod	6.79					
23														