Ira A. Fulton Schools of Engineering -The Polytechnic School

Technological Entrepreneurship & Management Department
Master's Management of Technology

OMT 570 - Advanced Project Management

InteGreat - *Simplifying Social Media, Amplifying Growth*

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Date: Feb 23rd, 2024

This cover sheet documents all team member's accountability and acceptance of this work. In addition, the team provides an overall Team Evaluation for each assignment.

The following team members for the group, The Trailblazers, certify that the following document is our work and that all material drawn from other sources has been fully acknowledged. Each team member certifies that he/she possesses a copy of the attached work and has contributed to its content.

Printed Name	Signature	Date
Ashmitha Pandeti	Ashmitha Pandeti	23rd Feb 2024
Hitansh Joshi	Hitansh Joshi	23rd Feb 2024
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Sai Ganapathy Swaminathan	Sai Ganapathy	23rd Feb 2024

TEAM EVALUATION FOR GROUP PROJECT ASSIGNMENT – PT5

Each team member identifies the overall rating of this assignment based on the Group Contract signed at the beginning of the semester. The rating scale is 5 (Highest) to 0 (Lowest). Please add actions required to improve group teamwork.

Name	Overall Group Contract Compliance (0-5)	Actions required to improve group performance
Project Leader Sai Ganapathy Swaminathan	4.7	Overall Great Performance.
Ashmitha Pandeti	4.7	Great work in brainstorming sessions and coordinating the team.
Janhavi Anand Chavan	4.8	Good work in bringing more ideas and inputs for this project.
Sai Chandni Chellakumar	4.8	Professional execution and input for all scenarios of the project.
Hitansh Joshi	4.0	Need to work on sticking to the project scope. Can improve contribution.

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1. Project Overview

1.1. Purpose, Scope and Objectives, and Business Case

1.1.1. Scope

1.1.1.1. Background

Due to the rapid rate of technological upgrades, various businesses and startups have emerged. Among the various marketing platforms, social media has become one of the highly reliable platforms for these ventures to showcase and promote their products or services. These businesses try to expand their customer base by promoting their products or services via. Social media like X (formerly Twitter), LinkedIn, Instagram, Facebook, Reddit, etc. This helps these companies to reach the end customers directly, portray the portfolio of products, gain a good brand image among the customers, and also create a personal connection with the customers. These social media platforms also provide intuitive dashboards that give insights into the advertisements and customer reach.

We will be developing a B2B application called “InteGreat” which will be a one-stop solution to integrate all the social media platforms that help these businesses gain insights and market their brand effectively.

1.1.1.2. Problem Statement

Since social media has become one of the most reliable places for marketing and these days many social media platforms have a lot of users, it has become an overhead for business owners to maintain different social media accounts individually. This is rather **time-consuming** and businesses usually tend to **miss out on responding to the queries/inquiries** raised by the customers. Also, it becomes very hard to track the customers, and also cannot **have a holistic view of all the marketing statistics in a single place** to optimize marketing strategies. “InteGreat” aims to resolve the above-mentioned problems through a single application.

1.1.1.3. Problem Solution

“InteGreat” is a B2B software application that will resolve the above-mentioned issues for business owners and optimize their marketing plans.

Marketers can configure their social media accounts under a single InteGreat sign-in. InteGreat will help users create posts on all social media platforms simultaneously at the same time, schedule advertisements, and read comments and views all at the same time from a single dashboard. This saves a lot of time and also helps in keeping track of all the leads generated through multiple platforms.

InteGreat will help the marketing team resolve the following issues.

- Time Management
- Cross-Platform Integration
- Gain marketing insights into all social media platforms together
- Scheduling events when most of their customers are active
- Optimize marketing strategies

1.1.1.4. Stakeholders

Internal Stakeholders

- Managers and Directors
- Technical Project managers
- Assistant Project managers
- Data Analysts
- Full-stack Web/Application Developers
- Quality Analysts
- Consultants (Financial/ Cybersecurity / Business)
- Webmasters
- Cybersecurity Engineers
- UI/UX Designers
- Marketing Analyst
- Support Technicians
- Sales Account Managers

External stakeholders

- Social Media Influencers
- Investors
- Customers

1.1.1.5. Constraints

Since there are many processes involved in the design and development of this application, there might be some limiting factors that affect the outcome of the project. Some are listed below.

Time Constraints: Since this is a web-based application, there could be delays in deploying the application on the server. Another reason is any delays faced during the SDLC stages of the application.

Financial Constraints: Most software projects are subjected to financial budget overshoot as there might be changes or enhancements in the scope of the application during the development stage.

Resource Constraints: Non-availability of skilled developers which might affect decisions on task prioritization, or other necessary tasks.

Regulatory Constraints: Since this is a software application, few countries expect the application to satisfy some regulations before it can be used in their location as this stores the personal data of the customers. Some include HIPAA, GDPR, CCPA, etc.,

Technology Constraints: Since this application integrates with other platforms, there might be issues with the availability of APIs. Social media platforms need to keep their APIs open and accessible for this application to use them.

1.1.2. Statement of Work

Key Milestone		
Completion Date	**Milestones and Tasks**	
	Milestones	**Tasks Involved**
28 February 2024	Requirement Gathering and Analysis	Identify needs and requirements for the project Analyze the existing social media platforms Define functional and nonfunctional requirements
5 March 2024	Feasibility Study	Assess the viability of the project Check market demand Resource Availability Technical Complexity
14 March 2024	System Design	Software architectural design Database Design UI Prototypes Analyze Scalability, Performance, Security and Usability
2 April 2024	Implementation	Backend development Frontend development Mobile Application Development Unit testing Integration testing and debugging
29 April 2024	Validation	Functionality and Security Testing Mobile App Testing Scalability and performance testing Test Case Documentation
7 May 2024	Beta Release	Deploy application Monitor and collect feedback Implement changes based on feedback
14 May 2024	Documentation	Prepare Help documents, FAQs and Quick Links Prepare "HowTo" blogs and videos
16 May 2024	Final Deployment	Deploy web application Deploy mobile application Launch website and landing page Update user manuals
16 May 2024	Maintenance and Support	Address vulnerability and issues Provide Customer support

Figure 1.1.2. A Milestone Plan

Human Resource and Technology allocation	
Human Resources	
Project Manager	Quality Analyst
Data Analyst	Cyber Security Specialist
Software architect	Mobile App Developers
Software Cloud Engineer	Content Writer
Product Manager	Marketing specialist
Software Developer (Backend)	DevOps Engineer
UI/UX Designer	Network Administrators
UI/UX Developer	Support Technician
Hardware and Software Requirements	
Computer Systems with high processing power	
Data Visualisation Tools - PowerBi	
Cloud Computing Instances Subscriptions	
Automation Testing Tools - Selenium	
UI Design Tools - Figma, Adobe, LucidChart	
Backend Development Tools - IDEs	
Version Control Tools - GIT, Mercurial	
Licensing for third party dependencies	
Project Management Tools Subscription - Libre, MS Project	
ITOM Software	
Cybersecurity Tools - Wireshark, Postman, OWASP ZAP	
CMS Tools for website deployment	
ITSM Tools for support handling - ServiceNow	
Team Collaboration Tool - Slack, MSTeams	
Database Systems - Oracle, PgSql	
DevOps Applications - Jenkins	
Marketing tools - Marketo	

Figure 1.1.2.B Resource and Technology Allocation

Risks and Concerns		
Risk Categories	**Concerns**	**Mitigation Strategies**
Requirements Risks	The requirements are not gathered and documented properly.	Clear documentation, reviews, and sign-offs should be provided.
Scope Risks	The client requests additional features not in scope.	Negotiate for proving the features in the next releases. Demand for the required resources, budget and extend the timeline of the project
Design Risks	The design does not align with the requirements and is not of good quality.	Proper reviews and signoffs should be provided. Design cookbooks should be created will all best practices for design
Technical Risks	Development done with poor quality code and the wrong tech stack will create performance issues and scalability issues	Proper feasibility analysis should be done for choosing the tech stack. Document the best practices for coding and perform code reviews frequently.
Quality Risks	Improper testing and bug maintenance lead to poor quality of the product	Multiple testing rounds should be done with proper documentation of the bug life cycle.
Human Resources Risks	Employee's resignation, absenteeism, personal issues	Review resource allocations regularly and have backup resources. Conduct feedback/ resource well-being meetings
Financial Risks	Budget Overruns and Market Changes	Review the budget estimation regularly and have a backup budget for the crisis.
Project Management Risks	Poor timeline, resource management, and project planning.	Use Project Management tools and practices and constantly review and adapt to changes.

Figure 1.1.2.C Risks and Concerns

Milestones vs. Acceptance Criteria	
Milestones	**Acceptance Criteria**
Requirement Gathering and Analysis	1. All the stakeholders have been identified and their specific needs for the project are documented. 2. All current social media platforms are examined and useful insights are extracted. (**Analyze usage trends of each social media and important KPIs should be arrived - LinkedIn, Facebook, Insta, YouTube, Reddit, Pinterest**) 3. Every functional and nonfunctional requirement is properly documented and approved.
Feasibility Study	1. The technical feasibility of the project is evaluated by taking into account the risks and limitations of existing technologies and mitigation strategies are proposed for the risks. 2. All the resource requirements are identified and cost estimates are developed needed to complete the project. 3. Market research related to its size, market growth, and target audience is conducted and documented properly. **User adoption and engagement rate should be greater than 80%.**
System Design	1. Establish cloud services with proper architecture to handle huge traffic **(Around 50,000 live sessions)** and latency (**<1ms**). 2. Database design is documented and approved. **(Relational Database - MSSQL, MySQL, PgSQL)** 3. UI prototypes are created, and tested and the design is approved (**Figma, Adobe**) 4. The performance and security analysis is done wherein respective measures are tested and verified.**(Validating using Postman, wireshark for finding OWASP Vulnerabilities)**
Implementation	1. The API testing is successfully done and documented properly. **Vulnerabilities like DDOS, XSS, Path Traversal etc., should be verified** 2. All back and front-end functionalities are implemented according to the approved design and tested. **The final product should align with the prototype.** 3. The mobile application is developed according to the approved design and it meets the established benchmarks. **Should comply with regulatory rules for global adoption like HIPAA, ISO, GDPR etc.** 4. The integration testing is successfully done. 5. The unit testing is completed with 90% of code coverage.

Milestones	Acceptance Criteria
Validation	1. Every functionality is fully evaluated and functions as expected. 2. Test cases are created, verified, and documented. 3. Mobile app testing is completed on all the devices.
Beta Release	1. Deployment is done without any major issues and is accessible to testers. **Beta app should scale 10,000 live test sessions without performance issues**. 2. The feedback is collected from testers based on which respective changes are implemented.
Documentation	1. All the core functionalities and troubleshooting steps for the application are documented and approved. **Upload atelast 90% of the documentations in CMS before release.** 2. The video with overall functionality is created and is accessible to users along with quick links. **Prepare 20 videos explaining each functionality.**
Final Deployment	1. Deployment of Mobile application to the app store is completed successfully. 2. The web application is deployed and the landing page is launched without any issues. 3. The user manual is updated and accessible to all users. 4. **All domains must be live (.eu, .com, .in, .cn., .jp, .au)**
Maintenance and Support	1. The application is regularly checked for any flaws in functionality, security, or performance. 2. The user issues are addressed by customer support and the system is upgraded regularly. **Support tickets analysis should be done on a weekly, biweekly and monthly basis.**

Figure 1.1.2.D Acceptance Criteria

1.1.3. Business Case

The presence of businesses in social media has become important for a business's success. The business case of this project aims to ease out social media processes for companies and help in advertising their products and services to large amount of people through innovative user-friendly features.

- Social Media Management - Enables user access multiple social media accounts in single platform. Includes scheduling posts early which saves time and effort for marketers.
- Improved Marketing Strategy - Provides insights and analytics about social media marketing trends in different geolocations to make data-driven business decisions.
- Improve Brand Image - Focus in brand image and grow the business to earn customer trust and loyalty.
- Business size and Customer adaptability - Functional features to adapt customers from various segments of business, from startups to big techs. Improved scalability to accommodate the high volume of social media activity.
- Competitive advantage - Social media management process streamlining helps businesses attain a competitive advantage in terms of generating leads from various platforms.
- **Revenue Opportunity** - Adverse marketing and reaching out to revenue out of leads generated through multiple social media platforms quickly and effectively.

1.2. Project Deliverables

- InterGreat B2B Application: The final product is the fully functional “InteGreat” B2B application. This software will act as a central hub for integrating multiple social media profiles.
- User Authentication and Social Media Account Integration: By signing into InteGreat, users will be able to easily connect multiple social network accounts.
- Unified Dashboard: A dashboard will be created to give users a single interface to manage all their social media data. The dashboard will display all interconnected social media site insights, statistics, and notifications
- Posting and Scheduling Features: With InteGreat, you will be able to create and publish content on multiple social media sites at the same time. You will also be able to plan posts for future publishing.
- Ad Management: This feature will help you plan, schedule, and create ads on different social media networks. Advertisers will be able to track the reach of their ads and make changes as needed to get the most out of their marketing plans.
- Real-Time Engagement Monitoring: No matter what the social media platform is, InteGreat allows users to track and respond to messages, comments, and interactions in real-time from their customers.

- Analytics and Reporting: The application's comprehensive analytics and reporting will provide valuable insights into your marketing performance across your integrated social media channels, including metrics such as Reach, Engagement, Conversion, and more.
- Customization and Personalization: InteGreat's customization options allow you to personalize your experience to specific business needs and preferences. For example, you can customize your dashboards, notify preferences, and report parameters.
- User Training and Support Materials: To ensure that customers can take full advantage of all the features offered by InteGreat, we'll provide comprehensive user training materials and documentation, as well as support resources.
- Maintenance and Updates: The program will be regularly updated and maintained to ensure it's stable, secure, and compatible with new and evolving social media platforms, technologies, and platforms.

All of these deliverables work together to provide companies with a simple, easy-to-use way to manage their entire social media marketing efforts through one, integrated platform.

1.3. Project Organization

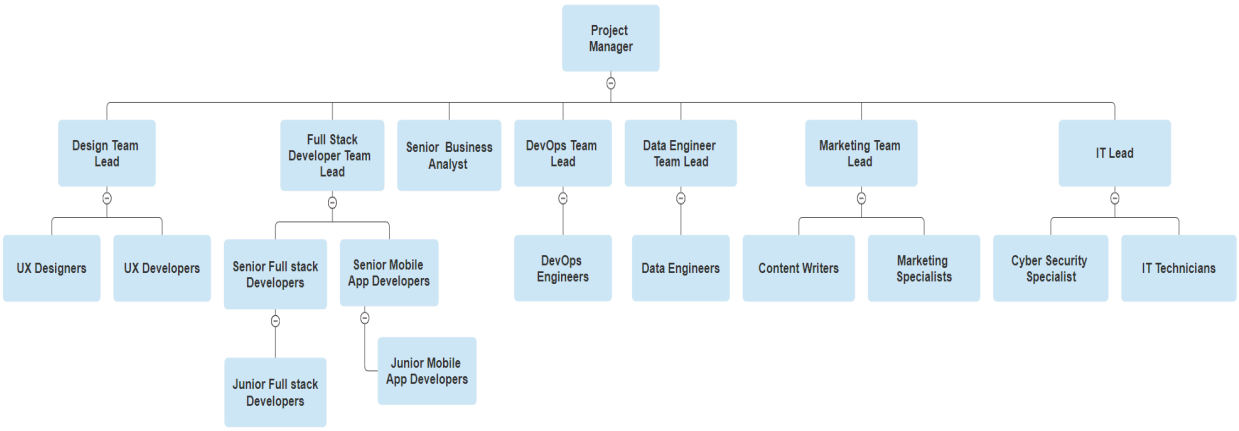


Figure 1.3A Project Organization

- **Project Manager:**
  - Our Project Manager is responsible for the project planning, executing, and monitoring the project, collaborating with all stakeholders to ensure that the project is delivered on time, on budget, and within the scope.
  - Responsible for getting approvals and sign-offs from the responsible parties for each phase of the project.

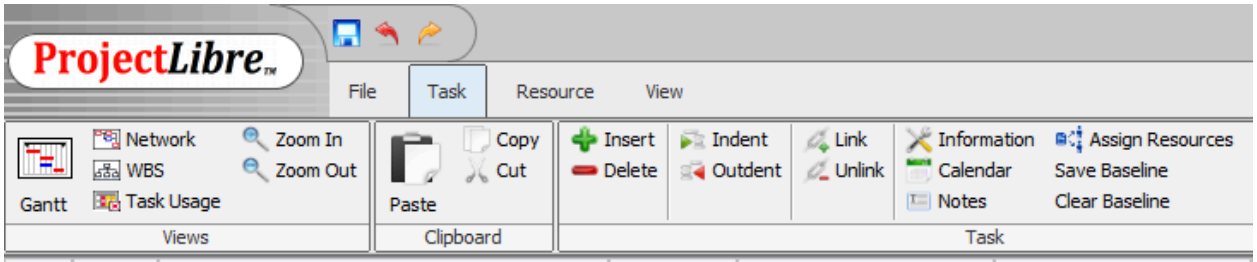
- **Design Team Lead:**
    - Our design team lead is responsible for leading the design team, reviewing the design, providing the design approval, and ensuring the design is aligned with the requirements.

- **UX Designers:** Responsible for designing the user experience of the project using the tools Figma, Adobe, and LucidChart.
- **UX Developers:** Responsible for developing the user experience of the project.
- **Full Stack Developer Team Lead:** Responsible for leading the team of developers, reviewing the code, and providing sign-off for the code.
- **Senior Full Stack Developer:** Responsible for developing both the front-end and back-end code of the project assigning tasks and guiding the junior developers.
- **Junior Full Stack Developer:** Responsible for developing the tasks assigned by the senior developers.
- **Senior Mobile App Developer:** Responsible for developing the mobile apps for the project and assigning tasks and guiding the junior developers.
- **Junior Mobile App Developers:** Responsible for developing the tasks assigned by the senior developers.
- **Senior Business Analyst:** Responsible for gathering and analyzing business requirements for the project**.**
- **DevOps Team Lead:** Responsible for leading the team of DevOps Engineers, reviewing their work, and providing sign-off for deploying and documentation.
- **DevOps Engineer:** Responsible for developing the environments for deploying the applications and documenting the steps.
- **Data Engineer Team Lead:** Responsible for leading the team of Data Engineers, reviewing their work, and providing sign-off for the data models.
- **Data Engineers:** Responsible for developing the data systems and maintaining the databases for the project.
- **Marketing Team Lead:** Responsible for leading the Content writers and Marketing specialists, reviewing their work, and providing sign-off.
- **Content Writers:** Responsible for preparing content for blogs, and websites and for promoting the product.
- **Marketing Specialists:** Responsible for preparing strategies for Email marketing, Content marketing, and social media marketing. Providing sign-off for all marketing activities.
- **IT Lead:** Responsible for overseeing the IT infrastructure for the project including hardware, software, and any required resources for the project.
- **Cyber Security Specialists**: Responsible for data protection and data security.
- **IT Technicians:** Responsible for handling any technical issues faced by the team.

1.4. Work Breakdown Structure (WBS)

The Work Breakdown Structure for this project is created using ProjectLibre, project management software. This breakdown of works helps in identifying the start and end date of the work packages which helps to align with the scope and schedule of the

project. Major works have been split into smaller work packages. Considering the efforts and man hours required for each task, an estimated duration of the tasks is assigned.



		Name	Duration	Start	Finish
1		**Requirement Gathering and Analysis**	4 days	**2/28/24 8:00 AM**	**3/4/24 5:00 PM**
2		Identify needs and requirementsfor the project	2 days	2/28/24 8:00 AM	2/29/24 5:00 PM
3		Analyze the existing social media platforms	1 day	3/1/24 8:00 AM	3/1/24 5:00 PM
4		Define functional and non functional requirement	1 day	3/2/24 8:00 AM	3/4/24 5:00 PM
5		**Feasibility Study**	7 days	**3/5/24 8:00 AM**	**3/13/24 5:00 PM**
6		Assess the viability of the project	2 days	3/5/24 8:00 AM	3/6/24 5:00 PM
7		Check Market Demand	2 days	3/7/24 8:00 AM	3/8/24 5:00 PM
8		Resource Availability	1 day	3/9/24 8:00 AM	3/11/24 5:00 PM
9		Technical Complexity	2 days	3/12/24 8:00 AM	3/13/24 5:00 PM
10		**System Design**	12 days	**3/14/24 8:00 AM**	**3/29/24 5:00 PM**
11		Software Architecture Design	3 days	3/14/24 8:00 AM	3/18/24 5:00 PM
12		Database Design	3 days	3/19/24 8:00 AM	3/21/24 5:00 PM
13		UI Prototypes	4 days	3/22/24 8:00 AM	3/27/24 5:00 PM
14		Analyze Scalability, Perf, Security, Usability	3 days	3/27/24 8:00 AM	3/29/24 5:00 PM
15		**Implementation**	19 days	**4/2/24 8:00 AM**	**4/26/24 5:00 PM**
16		Backend Development	4 days	4/2/24 8:00 AM	4/5/24 5:00 PM
17		Frontend Development	3 days	4/6/24 8:00 AM	4/10/24 5:00 PM
18		Mobile App Development	2 days	4/11/24 8:00 AM	4/12/24 5:00 PM
19		Unit Testing	6 days	4/13/24 8:00 AM	4/22/24 5:00 PM
20		Integration Testing and Debugging	4 days	4/23/24 8:00 AM	4/26/24 5:00 PM
21		**Validation**	6 days	**4/29/24 8:00 AM**	**5/6/24 5:00 PM**
22		Functionality and Security Testing	5 days	4/29/24 8:00 AM	5/3/24 5:00 PM
23		Mobile App Testing	5 days	4/29/24 8:00 AM	5/3/24 5:00 PM
24		Scalability Testing	4 days	4/29/24 8:00 AM	5/2/24 5:00 PM
25		Test Case Documentation	2 days	5/3/24 8:00 AM	5/6/24 5:00 PM
26		**Beta Release**	5 days	**5/7/24 8:00 AM**	**5/13/24 5:00 PM**
27		Deploy Application	1 day	5/7/24 8:00 AM	5/7/24 5:00 PM
28		Monitor and Collect Feedback	1 day	5/7/24 8:00 AM	5/7/24 5:00 PM
29		Implementation based on feedback	4 days	5/8/24 8:00 AM	5/13/24 5:00 PM
30		**Documentation**	2 days	**5/14/24 8:00 AM**	**5/15/24 5:00 PM**
31		Prepare Help document, FAQ, Quick Links	1 day	5/14/24 8:00 AM	5/14/24 5:00 PM
32		Prepare HowTo	2 days	5/14/24 8:00 AM	5/15/24 5:00 PM
33		**Final Deployment**	1 day	**5/16/24 8:00 AM**	**5/16/24 5:00 PM**
34		Deploy web application	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM
35		Deploy mobile application	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM
36		Launch website	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM
37		Update user manual	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM

Figure 1.4.A Work Breakdown Structure

1.5. Responsibility Assignment Matrix (RAM)

The responsibility assignment matrix(Figure 1.5 A) identifies which team member of our project is responsible for the particular tasks in the Project's development. The matrix not only shows which member of the project team is in charge of each task, but it also shows which other members of the team are important at each point, organized by how they need to help with that task. The RAM indicates sign-off requirements, who has to be informed at each stage of the task's completion, and where each person can go for task support. Based on the deliverables from the Work Breakdown Structure, the matrix helps to keep the project organized and functioning efficiently.

- Sai Ganapathy Swaminathan - Project Manager
- Sai Chandni Chellakumar - Software Developer
- Ashmitha Pandeti- Product Manager
- Janhavi Anand Chavan- Quality Analyst
- Hitansh Joshi-Data Analyst

Legend:

1. Responsible (R): The employee in charge of executing this deliverable.
2. Approval (A): The employees who are responsible for completing the work and signing it off.
3. Support (S): The employees who, in an emergency, should be consulted as specialists.
4. Notified (N): The employees who will be informed of the status of the deliverables.

DELIVERABLES	SUBDELIVERABLES	SAI	CHANDNI	ASHMITHA	JANHAVI	HITANSH
Requirement Gathering and Analysis	Identify needs and requirements for the project	R	S	A	N	S
	Analyze the existing social media platforms	R	S	A	N	S
	Define functional and nonfunctional requirements	R	S	A	N	N
Feasibility Study	Assess the viability of the project	R	N	A	N	S

DELIVERABLES	SUBDELIVERABLES	SAI	CHANDNI	ASHMITHA	JANHAVI	HITANSH
	Check market demand	R	N	A	N	S
	Resource Availability	R	S	A	N	N
	Technical Complexity	R	N	A	N	S
System Design	Software architectural design	A	R	S	N	N
	Database Design	A	R	N	N	N
	UI Prototypes	A	R	S	N	N
	Analyze Scalability, Performance, Security and Usability	A	R	N	N	S
Implementation	Backend development	A	R	N	N	S
	Frontend development	A	R	N	N	S
	Mobile Application Development	A	R	N	N	S
	Unit testing	A	R	N	S	N
	Integration testing and debugging	A	R	N	S	N
Validation	Functionality and Security Testing	A	S	N	R	S

DELIVERABLES	SUBDELIVERABLES	SAI	CHANDNI	ASHMITHA	JANHAVI	HITANSH
	Mobile App Testing	A	S	N	R	N
	Scalability and performance testing	A	S	N	R	N
	Test case Documentation	A	S	N	R	N
Beta Release	Deploy application	A	N	N	S	R
	Monitor and collect feedback	A	N	N	S	R
	Implement changes based on feedback	A	N	N	S	R
Documentation	Prepare Help documents, FAQs and Quick Links	A	S	N	N	R
	Prepare "HowTo" blogs and videos	A	S	N	N	R
Final Deployment	Deploy web application	A	S	R	N	S
	Deploy mobile application	A	S	R	N	S
	Launch website and landing page	A	S	R	N	N
	Update user manuals	A	N	R	S	N

DELIVERABLES	SUBDELIVERABLES	SAI	CHANDNI	ASHMITHA	JANHAVI	HITANSH
Maintenance and Support	Address vulnerability and issues	A	S	N	N	R
	Provide Customer support	A	S	N	N	R

Figure 1.5. A Responsibility Assignment Matrix

2. Project Risk Assessment

2.1. Risk Analysis

2.1.1. **A - Accidental Expenditures** - The project depends on cloud services and third-party application subscriptions. These pricing models are volatile and might cause sudden high expenditures to develop and deploy the application. This might impose a stress on the project budget.

2.1.2. **B - Cost Overrun -** Risk associated with the increase in the scope of the project might cause the budget to overshoot as a consequence of purchasing a new third-party service and recruiting new resources.

2.1.3. **C - API Dependency** - Limited functionality of the APIs of the integrated social media platforms might limit the capability of the product. The risk of API deprecation or version upgrade might lead to delayed project progression.

2.1.4. **D - Scalability and Performance -** An increased number of users could cause application performance issues like system slowness and reduced throughput rates.

2.1.5. **E - Data Security -** The risk of data leakage jeopardizing user data can lead to decreased application adoption rates, delays in project completion, and legal consequences for the company.

2.1.6. **F- User Engagement**- Launching a new application into the market that users are not familiar with could introduce usability concerns and customers will feel difficulty in accessing the application.

2.1.7. **G - Performance issues** - A software application should be scalable on a large scale. Failure to meet this requirement might introduce performance issues in the product and directly reduce customer satisfaction. Reduced customer satisfaction will reduce the revenue for the company as customers will not renew their subscriptions.

2.1.8. **H- Data compliance -** Data protection laws and regulations have been very prevalent in recent times and new laws are coming up now and then. Losing track of any of these compliances could directly affect the product's reputation and customer base.

2.1.9. **I - Resource Crunch** - The human resources in the software product development industry are very volatile. Since the opportunities for software skills are huge in the market, employees might move to different organizations for monetary benefits.

2.1.10. **J - Legal and Regulatory Compliance** - The data centers needed for building these applications need statutory approvals and need to satisfy government maintenance regulations like carbon control and so on. Missing this could lead to a huge ransom or fine for the company.

2.2. Qualitative Risk Assessment

Qualitative risk assessment is the process of evaluating and assessing a discovered risk according to its severity and likelihood of consequences. Without assigning the numerical values, it allows for risk evaluation based on subjective criteria. It focuses on knowing what risks are and how they affect things rather than using exact metrics to measure them. The qualitative risk grid for our project is shown in **Fig. 2.2.1.A.**

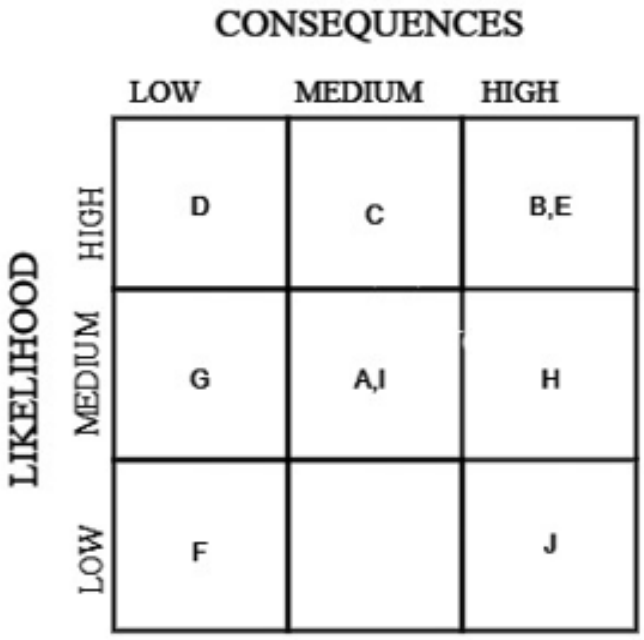


Figure 2.2.1.A Qualitative Risk Matrix

2.3. Quantitative Risk Assessment

2.3.1. Project Risk Score

Quantitative risk assessment involves assigning numerical values to different parameters like the probability of failure and the consequence of failure for ease of analysis. This method aims at giving a more objective and fairer understanding of the probabilities that various risks may occur and what might be their possible impacts thereby enabling organizations to make more evidence-based risk management decisions. The risk score is a quantitative metric that combines the likelihood of a risk with its potential consequences, facilitating the evaluation of risks according to their overall importance. The calculations for the overall risk factor of our project are illustrated in Figure 2.3.1.A.

2.3.1.1. Probability of Failure (Pf)

Three key factors to consider in the assessment of the probability of failure are the maturity, complexity, and dependency of individual risk items. Maturity is the degree of development or stability exhibited by such a risk item that shows how well it has been established or refined. Complexity relates to the intricacy or sophistication associated with it, which includes issues like the number of components and processes involved. Lastly, dependence refers to the extent to which risk-taking elements depend on others for their success. These three factors are evaluated and further added together and divided by three to come up with an average; this allows you to find out what general likelihood exists that something might not go as planned.

2.3.1.2. Consequence of Failure (Cf)

The consequence of failure requires an analysis of potential impacts across four dimensions: cost, schedule reliability, and performance. Costs reflect the financial implications associated with failure, including direct expenses and possible losses. Schedule on the other hand concerns itself with how project timelines or deadlines are affected due to failures. Again, Reliability is all about the honesty or faithfulness of what comes out after taking into account the accuracy as well as consistency aspects among others. Performance looks at whether a system or process fulfills certain expectations to produce an acceptable output. Furthermore, by combining these dimensions and calculating their average we can arrive at overall consequences which help to determine the severity of potential outcomes thus informing risk management decisions.

2.3.1.3. Risk Factor

Risk factor is the probability of failure multiplied by the consequence of a risk. It gives an overall picture of risks linked to particular items or activities on account of risk. The product of probability and consequence is subtracted from the sum of probability and consequence of failure which provides the overall risk factor. A higher risk factor might indicate that more concentration should be given to decreasing either the likelihood or effect of failure, thereby mitigation actions should be taken to decrease incidences or results related to vulnerabilities. **Figure 2.3.1. A** shows the calculation of the overall risk factor of our project.

$$\textbf{Average Pf} = \frac{0.5 + 0.4 + 0.2}{3} = 0.37$$

$$\textbf{Average Cf} = \frac{0.6 + 0.4 + 0.4 + 0.5}{4} = 0.48$$

$$\textbf{Overall Risk Factor} = (0.37 + 0.48) - (0.37 * 0.48) = 0.67$$

Figure 2.3.1.A Sample Calculations for Probability of failure, Consequence of failure, and Overall Risk Factors.

	Probablity of Failure(Pf)				Consequence of Failure(Cf)					
Item	Maturity	Complexity	Dependency	Average Pf	Cost	Schedule	Reliability	Performance	Average Cf	Overall Risk Factor
A	0.5	0.4	0.2	0.37	0.6	0.4	0.4	0.5	0.48	0.67
B	0.7	0.6	0.8	0.70	0.9	0.7	0.7	0.8	0.78	0.93
C	0.6	0.2	0.3	0.37	0.6	0.2	0.4	0.3	0.38	0.60
D	0.6	0.7	0.4	0.57	0.3	0.1	0.2	0.1	0.18	0.64
E	0.8	0.9	0.7	0.80	0.9	0.8	0.9	0.7	0.83	0.97
F	0.1	0.1	0.2	0.13	0.3	0.3	0.1	0.2	0.23	0.33
G	0.1	0.3	0.2	0.20	0.2	0.1	0.2	0.1	0.15	0.32
H	0.5	0.4	0.2	0.37	0.6	0.3	0.5	0.2	0.40	0.62
I	0.5	0.5	0.2	0.40	0.5	0.1	0.6	0.4	0.40	0.64
J	0.3	0.1	0.2	0.20	0.9	0.7	0.3	0.2	0.53	0.62

Figure 2.3.1.B - Quantitative Risk Spreadsheet for Overall Risk Factor

Quantitative Risk Assessment Mapping		
Risk Identification	**Risk Factor**	**Implications**
A	RF = 0.67 - Moderate Risk	Task A will be constantly reviewed to handle accidental expenditures.
B	RF = 0.93 - High Risk	Task B needs to be prioritized and carefully handled as RF is High
C	RF = 0.60 - Moderate Risk	Task C needs constant monitoring of the API Platforms and it needs to be updated based on the latest versions
D	RF = 0.64 - Moderate Risk	Task D can be handled by increasing the scalability of the application.
E	RF = 0.97 - High Risk	Task E needs to be considered as a high priority as RF is high and needs to be handled sensitively.
F	RF = 0.33 - Low Risk	Task F can easily handled when occurred after the product launch based on customer feedback
G	RF = 0.32 - Low Risk	Task G can be handled easily when performance issues occur.
H	RF = 0.62 - Moderate Risk	Task H should be monitored continuously to keep track of Laws and Regulations related to Data Compliance.
I	RF = 0.64 - Moderate Risk	HR should have the records of employees and develop strategies to handle resource crunch.
J	RF = 0.62 - Moderate Risk	Task J needs careful attention to ensure all the legal requirements are met and there are no severe penalties.

Figure 2.3.1.C - Categorization of Risk and its Implications

2.4. Risk Mitigation Strategies

High-Risk	Mitigation Strategies
Risk B: Cost Overrun Stakeholders ask for extra features or functionality to be included in the product during the development phase greatly broadening the project scope.	To account for scope changes, carry out thorough project planning and risk assessments. Conduct routine reviews of project budgets and schedules and promptly notify stakeholders of any deviations.
Risk E: Data Security Vulnerabilities in the infrastructure or application code cause a security breach that exposes private user information.	Identify and fix vulnerabilities by conducting frequent penetration tests and security audits. Instruct staff members on best practices for safeguarding data and enforce stringent guidelines for handling data.
Moderate-Risk	**Mitigation Strategies**
Risk A: Accidental Expenditures Unexpectedly high user demand for the project means that to manage the increased load a large increase in cloud service and third-party application subscriptions is needed.	Create financial cushioning in your budget to handle unforeseen increases in spending. Review pricing models regularly and look into ways to cut costs when possible.
Risk C: API Dependency Suddenly one of the integrated social media platforms deprecates its API or releases a significant version update making some of the product's functionalities broken or outdated.	Keep up with updates and deprecations regarding APIs and proactively modify the application to reduce interruptions. Create backup plans and strategies in case the API stops working or has limitations.
Risk D: Scalability and Performance System slowdowns and decreased performance result from an unexpected spike in user traffic to the application during peak usage hours.	Employ load balancing and auto-scaling techniques to dynamically modify resources in response to demand. Track application performance continuously and take proactive measures to fix performance problems and bottlenecks.
Risk I: Resource Crunch The labor market becomes more competitive when there is an abrupt spike in the need for qualified software developers.	Offer chances for professional development to raise employee loyalty and satisfaction. To create a pool of competent personnel form alliances with training centers and academic institutions.
Risk J: Legal and Regulatory Compliance	To find and fix any gaps or inadequacies conduct routine compliance audits and

Legal action against the company occurs when it fails to obtain the statutory approvals required for data centers or fails to adhere to government regulations regarding environmental sustainability.	assessments. Participate in industry associations and regulatory bodies to receive updates on modifications to laws and guidelines.
Low-Risk	**Mitigation Strategies**
Risk F: User Engagement Because of its poorly designed user interface or confusing user experience, the recently released application does not connect with its intended audience even after extensive market research and user testing.	Make investments in onboarding and user education materials to aid users in becoming acquainted with the program. Use value propositions, distinctive features, and focused marketing techniques to set the product apart.
Risk G: Performance issues Performance deterioration and frequent outages result from an unexpected surge in users that overwhelms the application infrastructure.	To reduce latency and enhance response times make use of caching techniques and content delivery networks (CDNs). Install reliable systems for monitoring and alerting to quickly identify and resolve performance problems.

Figure 2.4.1 - Risk Mitigation Strategies

3. Project Schedule

3.1. Activity Duration Estimation Table

3.1.1. Activity Duration Table

Activity duration estimates determine how long it will take to complete the project tasks. Developing such estimates involves using different techniques like historical data analysis, expert judgment or analogous estimation that is based on past experience. The table for activity duration acts as a central point for storing information about activities, expected duration, optimistic values, pessimistic values, most likely values and PERT. As such, the table provides an overview of the scope of the work package, its timelines, resource requirements and allows easy communication with decision makers. The activity duration table helps to allocate resources more accurately and identify the delays and risks associated with the project. The table is used as a baseline to compare the performance of projects which will help in continuous development and improvement of project over the time. **Fig 3.1.1.A** represents the Activity duration table of our project.

3.1.2. PERT (Program Evaluation and Review Technique)

Program Evaluation and Review Technique is a project management method used in estimating the time for completing a project by breaking it down into

individual activities, getting the estimated time required for each of the activities and then calculating the total duration of the whole project. This is useful when handling complicated projects which are uncertain about how long it will take to complete each task. PERT has three time estimates per activity namely: optimistic time which is the shortest possible duration assuming everything goes smoothly, most likely time is the duration expected under normal circumstances, and pessimistic time is the longest possible duration considering unforeseen delays or obstacles. These figures are then used to determine the expected duration of each event using a formula. Considering all three time estimates with more emphasis on the most likely value gives a more pragmatist estimate of how long every activity is anticipated to take. This will help them better plan and allocate resources, identify potential risks/ uncertainties, and determine the critical path. Thus, PERT helps project managers to make knowledgeable decisions, manage expectations, and cut down the possible risks. The PERT calculation and equation for one of our project's activities are shown in **Fig. 3.1.2.A.**

Deliverable	Work Package	Activity	Optimistic Time	Most Likely Time	Pesimistic Time	PERT
1	WP1	Identify needs and requirements for the project	2	5	2	4
	WP2	Analyze the existing social media platforms	1	1	2	1.17
	WP3	Define functional and non functional requirement	2	1	2	1.3
2	WP1	Assess the viability of the project	4	2	2	2.3
	WP2	Check Market Demand	3	2	1	2
	WP3	Resource Availability	4	1	1	1.5
	WP4	Technical Complexity	2	2	5	2.5
3	WP1	Software Architecture Design	6	2	4	3
	WP2	Database Design	8	2	4	3.33
	WP3	UI Prototypes	6	4	2	4
	WP4	Analyze Scalability, Performance, Security and Usability	5	2	5	3
4	WP1	Backend development	10	3	2	4
	WP2	Frontend development	9	1	5	3
	WP3	Mobile Application Development	3	2	1	2
	WP4	Unit testing	10	4	10	6
	WP5	Integration testing and debugging	11	2	6	4.17
5	WP1	Functionality and Security Testing	5	5	7	5.33
	WP2	Mobile App Testing	12	2	10	5
	WP3	Scalability and performance testing	6	4	2	4
	WP4	Test case Documentation	5	2	1	2.33
6	WP1	Deploy application	3	1	1	1.33
	WP2	Monitor and collect feedback	1	1	2	1.17
	WP3	Implement changes based on feedback	7	3	5	4
7	WP1	Prepare Help documents, FAQs and Quick Links	1	1	1	1
	WP2	Prepare "HowTo" blogs and videos	1	2	1	1.67
8	WP1	Deploy web application	1	1	2	1.17
	WP2	Deploy mobile application	2	1	2	1.3
	WP3	Launch website and landing page	2	1	1	1.17
	WP4	Update user manuals	3	1	1	1.3

Figure 3.1.1.A: Activity Duration Table

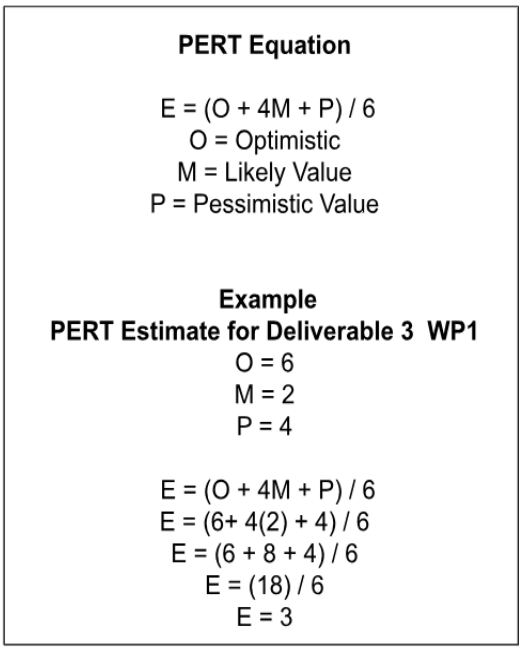


Figure 3.1.2.A - PERT Equation and Calculation for Deliverable 3, WP1

3.2. Gantt Chart with Critical Path

3.2.1. Gantt Chart

Gantt Chart is a graphical representation of tasks and deadlines. The chart helps in managing the tasks on a daily basis, allocation of resources well and determine the project's steps so far. Each task is also represented by horizontal bars on the chart that indicate its duration as well as starting and ending dates which are given below in Fig 3.2.1.A. This kind of visualization makes it easy for people to tell when a deadline is approaching while tracking progress in the tasks. It is also referred to supervisors, partners or stakeholders who can be able to understand them thus improving their understanding of goals and schedules for projects. They help to improve communication efficiency among those involved, accelerate activities management within a project and enable it to be successfully completed. **Fig 3.2.1.A** represents the Gantt Chart Schedule of our project. The completion date of our project is 16/05/2024.

3.2.2. Critical Path

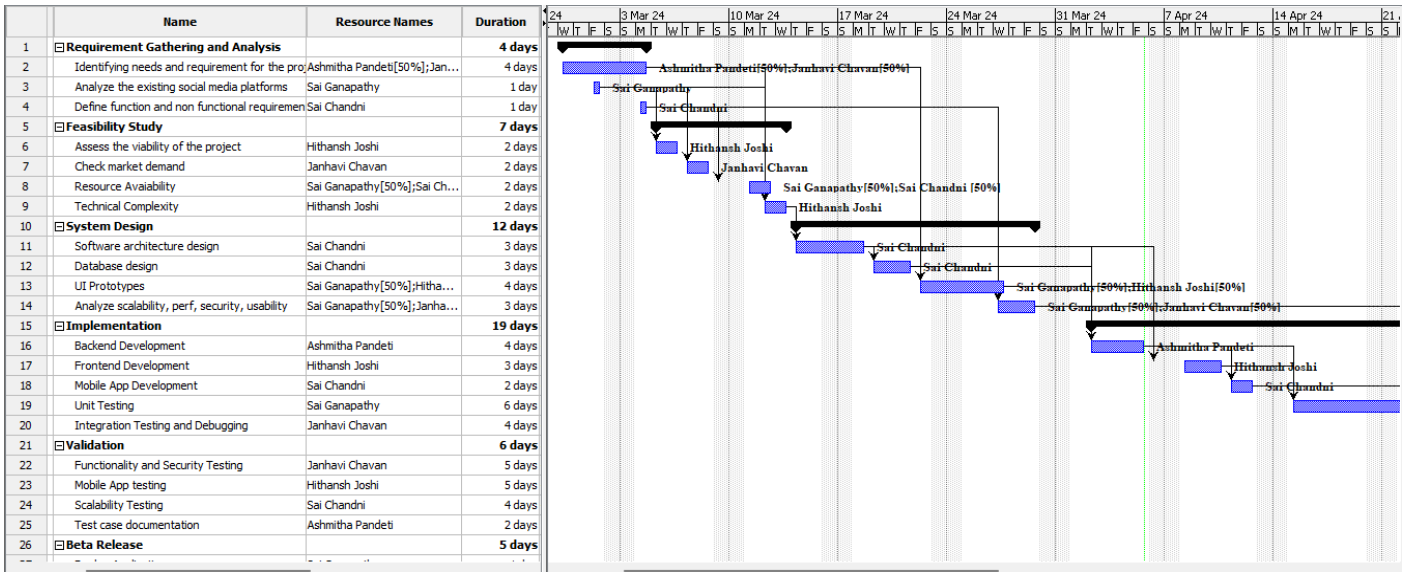
Critical path refers to sequence of activities that require least time for completing a project. It is the longest path in a project's network diagram, which means that if any of the tasks on this line are delayed, it will result in extension of the total project's time frame. There is no float or slack available for operations along this path because any delay will affect the entire project. Understanding what constitutes the critical path helps managers to focus on areas that matter most towards timely completion of each activity. Leaders can therefore allocate more

resources towards other necessary tasks while taking into account crucial ones as well as those with some slack. This results in resource allocation and minimizes instances of delays, improved planning and scheduling of work among others thereby maximizing efficiency. Also by monitoring activities being done across critical paths, Project Managers may be able to see potential spots for bottlenecks and other problems that could happen and manage to mitigate them on time so projects can be executed smoothly without issues related to timing when they must be handed over back to clients. Fig 3.2.1.C shows the critical path chart of our project.

The estimated time of completion for our project is 78 Days
The estimated date of completion for our project is 16/05/2024

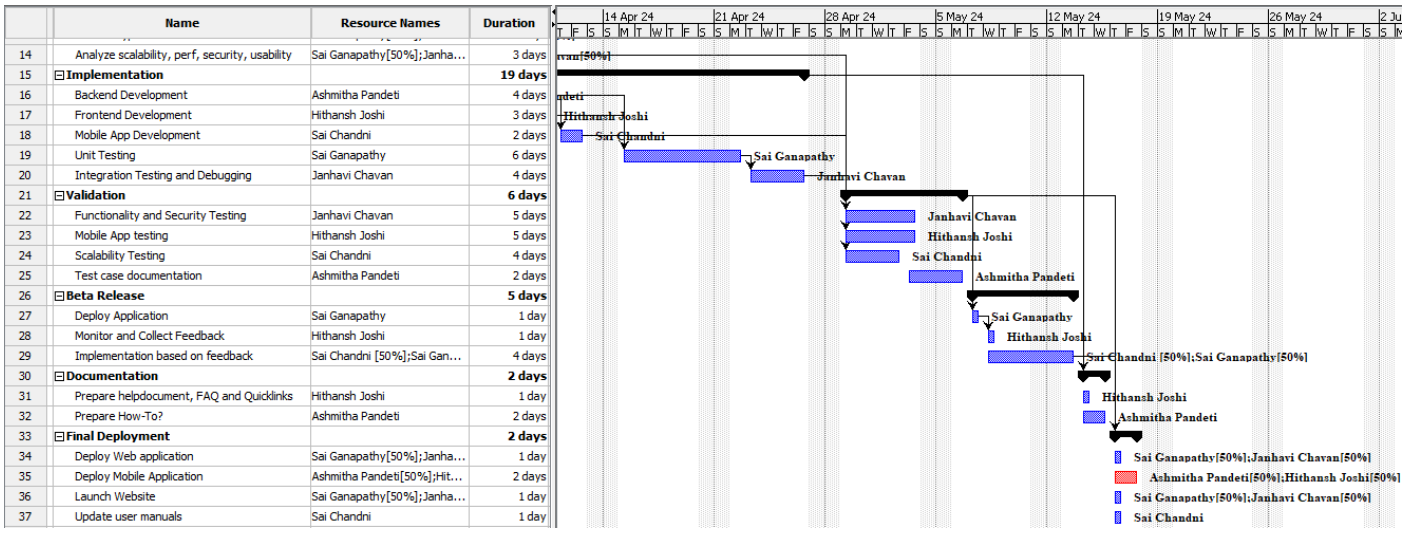
	Name	Duration	Start	Finish	Predecessors	Resource Names
1	**Requirement Gathering and Analysis**	4 days	**2/28/24 8:00 AM**	**3/4/24 5:00 PM**		
2	Identifying needs and requirement for the proj	4 days	2/28/24 8:00 AM	3/4/24 5:00 PM		Ashmitha Pandeti[50%];Jan...
3	Analyze the existing social media platforms	1 day	3/1/24 8:00 AM	3/1/24 5:00 PM		Sai Ganapathy
4	Define function and non functional requirement	1 day	3/2/24 8:00 AM	3/4/24 5:00 PM		Sai Chandni
5	**Feasibility Study**	7 days	**3/5/24 8:00 AM**	**3/13/24 5:00 PM**		
6	Assess the viability of the project	2 days	3/5/24 8:00 AM	3/6/24 5:00 PM	3	Hithansh Joshi
7	Check market demand	2 days	3/7/24 8:00 AM	3/8/24 5:00 PM	3	Janhavi Chavan
8	Resource Avaiability	2 days	3/9/24 8:00 AM	3/12/24 5:00 PM	4	Sai Ganapathy[50%];Sai Ch...
9	Technical Complexity	2 days	3/12/24 8:00 AM	3/13/24 5:00 PM	2;3;4	Hithansh Joshi
10	**System Design**	12 days	**3/14/24 8:00 AM**	**3/29/24 5:00 PM**		
11	Software architecture design	3 days	3/14/24 8:00 AM	3/18/24 5:00 PM	9	Sai Chandni
12	Database design	3 days	3/19/24 8:00 AM	3/21/24 5:00 PM	11	Sai Chandni
13	UI Prototypes	4 days	3/22/24 8:00 AM	3/27/24 5:00 PM	2;4	Sai Ganapathy[50%];Hitha...
14	Analyze scalability, perf, security, usability	3 days	3/27/24 8:00 AM	3/29/24 5:00 PM	4;11;12	Sai Ganapathy[50%];Janha...
15	**Implementation**	19 days	**4/2/24 8:00 AM**	**4/26/24 5:00 PM**		
16	Backend Development	4 days	4/2/24 8:00 AM	4/5/24 5:00 PM	11;12;14	Ashmitha Pandeti
17	Frontend Development	3 days	4/6/24 8:00 AM	4/10/24 5:00 PM	11;13;14	Hithansh Joshi
18	Mobile App Development	2 days	4/11/24 8:00 AM	4/12/24 5:00 PM	16;17	Sai Chandni
19	Unit Testing	6 days	4/15/24 8:00 AM	4/22/24 5:00 PM	16;17;18	Sai Ganapathy
20	Integration Testing and Debugging	4 days	4/23/24 8:00 AM	4/26/24 5:00 PM	19	Janhavi Chavan
21	**Validation**	6 days	**4/29/24 8:00 AM**	**5/6/24 5:00 PM**		
22	Functionality and Security Testing	5 days	4/29/24 8:00 AM	5/3/24 5:00 PM	20	Janhavi Chavan
23	Mobile App testing	5 days	4/29/24 8:00 AM	5/3/24 5:00 PM	18	Hithansh Joshi
24	Scalability Testing	4 days	4/29/24 8:00 AM	5/2/24 5:00 PM	14	Sai Chandni
25	Test case documentation	2 days	5/3/24 8:00 AM	5/6/24 5:00 PM		Ashmitha Pandeti
26	**Beta Release**	5 days	**5/7/24 8:00 AM**	**5/13/24 5:00 PM**		
27	Deploy Application	1 day	5/7/24 8:00 AM	5/7/24 5:00 PM	21	Sai Ganapathy
28	Monitor and Collect Feedback	1 day	5/8/24 8:00 AM	5/8/24 5:00 PM	27	Hithansh Joshi
29	Implementation based on feedback	4 days	5/8/24 8:00 AM	5/13/24 5:00 PM		Sai Chandni [50%];Sai Gan...
30	**Documentation**	2 days	**5/14/24 8:00 AM**	**5/15/24 5:00 PM**	**15**	
31	Prepare helpdocument, FAQ and Quicklinks	1 day	5/14/24 8:00 AM	5/14/24 5:00 PM		Hithansh Joshi
32	Prepare How-To?	2 days	5/14/24 8:00 AM	5/15/24 5:00 PM		Ashmitha Pandeti
33	**Final Deployment**	2 days	**5/16/24 8:00 AM**	**5/17/24 5:00 PM**	**21;29**	
34	Deploy Web application	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM		Sai Ganapathy[50%];Janha...
35	Deploy Mobile Application	2 days	5/16/24 8:00 AM	5/17/24 5:00 PM		Ashmitha Pandeti[50%];Hit...
36	Launch Website	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM		Sai Ganapathy[50%];Janha...
37	Update user manuals	1 day	5/16/24 8:00 AM	5/16/24 5:00 PM		Sai Chandni

Figure 3.2.1.A: Gantt Chart Schedule



	Name	Resource Names	Duration
1	**Requirement Gathering and Analysis**		**4 days**
2	Identifying needs and requirement for the pro	Ashmitha Pandeti[50%];Jan...	4 days
3	Analyze the existing social media platforms	Sai Ganapathy	1 day
4	Define function and non functional requiremen	Sai Chandni	1 day
5	**Feasibility Study**		**7 days**
6	Assess the viability of the project	Hithansh Joshi	2 days
7	Check market demand	Janhavi Chavan	2 days
8	Resource Avaiability	Sai Ganapathy[50%];Sai Ch...	2 days
9	Technical Complexity	Hithansh Joshi	2 days
10	**System Design**		**12 days**
11	Software architecture design	Sai Chandni	3 days
12	Database design	Sai Chandni	3 days
13	UI Prototypes	Sai Ganapathy[50%];Hitha...	4 days
14	Analyze scalability, perf, security, usability	Sai Ganapathy[50%];Janha...	3 days
15	**Implementation**		**19 days**
16	Backend Development	Ashmitha Pandeti	4 days
17	Frontend Development	Hithansh Joshi	3 days
18	Mobile App Development	Sai Chandni	2 days
19	Unit Testing	Sai Ganapathy	6 days
20	Integration Testing and Debugging	Janhavi Chavan	4 days
21	**Validation**		**6 days**
22	Functionality and Security Testing	Janhavi Chavan	5 days
23	Mobile App testing	Hithansh Joshi	5 days
24	Scalability Testing	Sai Chandni	4 days
25	Test case documentation	Ashmitha Pandeti	2 days
26	**Beta Release**		**5 days**

Figure 3.2.1.A Gantt Chart with Critical Path - Along with WBS View



	Name	Resource Names	Duration
14	Analyze scalability, perf, security, usability	Sai Ganapathy[50%];Janha...	3 days
15	**Implementation**		**19 days**
16	Backend Development	Ashmitha Pandeti	4 days
17	Frontend Development	Hithansh Joshi	3 days
18	Mobile App Development	Sai Chandni	2 days
19	Unit Testing	Sai Ganapathy	6 days
20	Integration Testing and Debugging	Janhavi Chavan	4 days
21	**Validation**		**6 days**
22	Functionality and Security Testing	Janhavi Chavan	5 days
23	Mobile App testing	Hithansh Joshi	5 days
24	Scalability Testing	Sai Chandni	4 days
25	Test case documentation	Ashmitha Pandeti	2 days
26	**Beta Release**		**5 days**
27	Deploy Application	Sai Ganapathy	1 day
28	Monitor and Collect Feedback	Hithansh Joshi	1 day
29	Implementation based on feedback	Sai Chandni [50%];Sai Gan...	4 days
30	**Documentation**		**2 days**
31	Prepare helpdocument, FAQ and Quicklinks	Hithansh Joshi	1 day
32	Prepare How-To?	Ashmitha Pandeti	2 days
33	**Final Deployment**		**2 days**
34	Deploy Web application	Sai Ganapathy[50%];Janha...	1 day
35	Deploy Mobile Application	Ashmitha Pandeti[50%];Hit...	2 days
36	Launch Website	Sai Ganapathy[50%];Janha...	1 day
37	Update user manuals	Sai Chandni	1 day

Figure 3.2.1.B Gantt Chart with Critical Path - Along with WBS View - Continuation

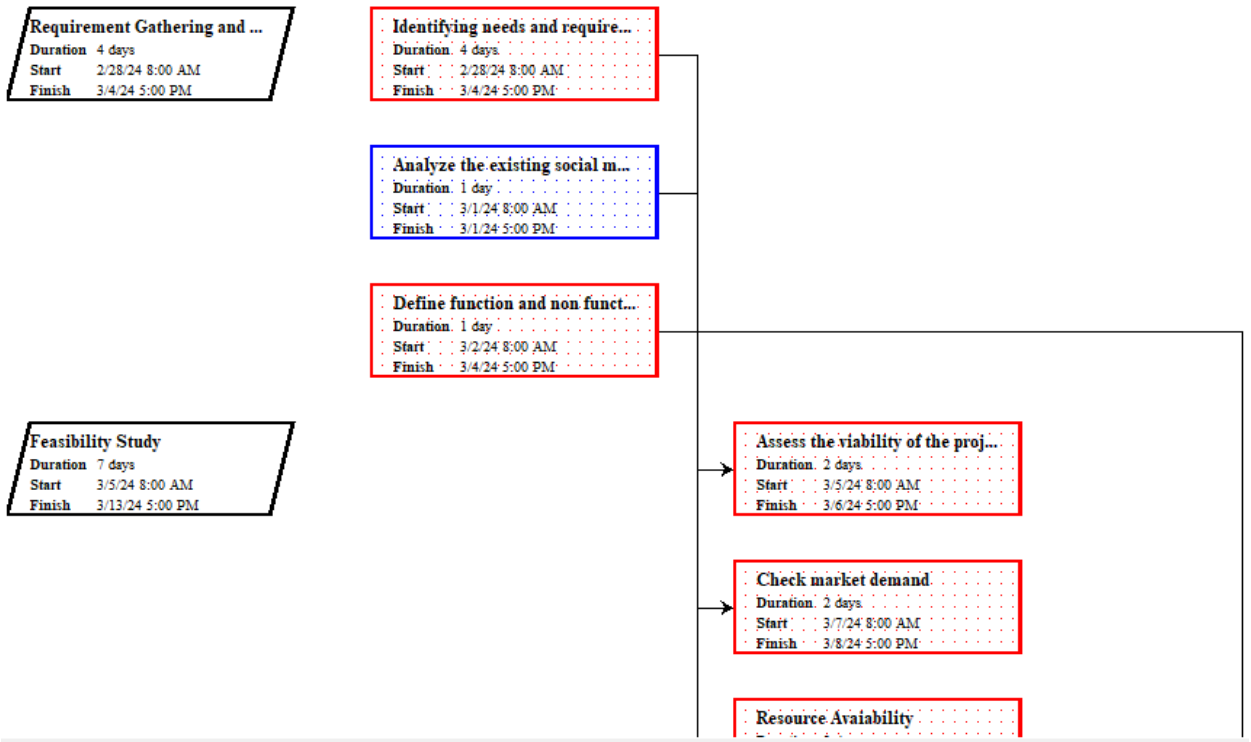


Figure 3.2.1.D Network Diagram

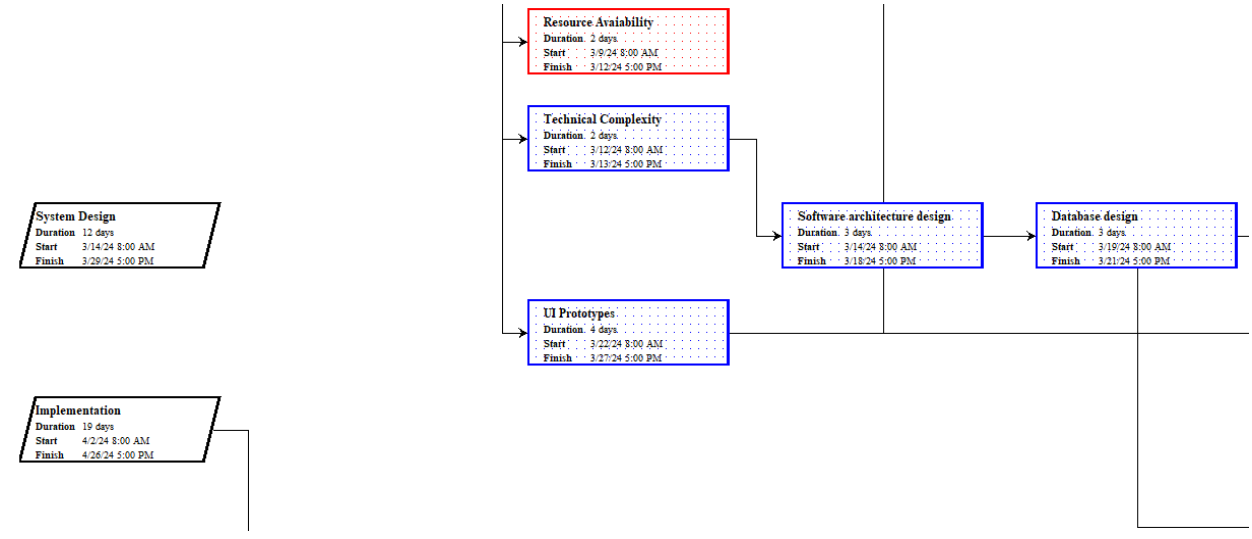


Figure 3.2.1.E Network Diagram - Continuation

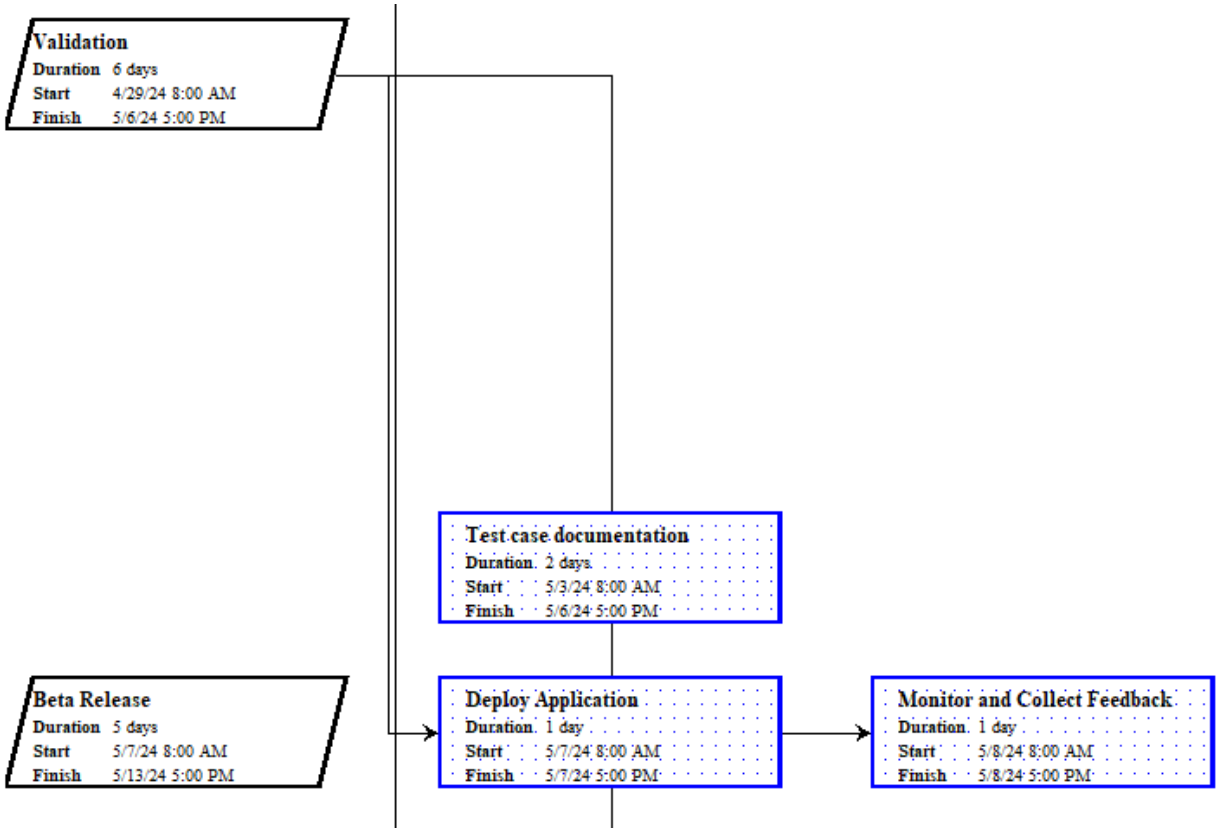


Figure 3.2.1.F Network Diagram - Continuation

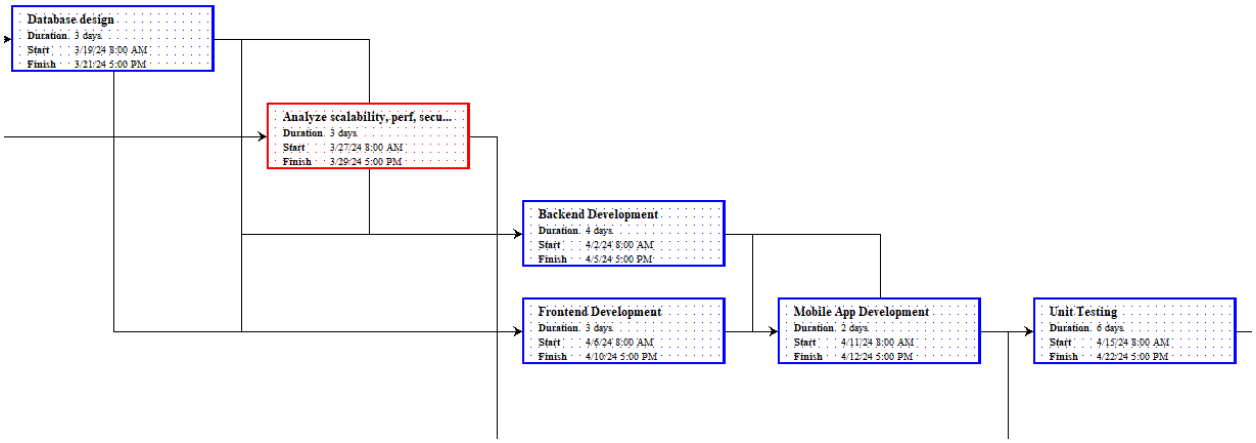


Figure 3.2.1.G Network Diagram - Continuation

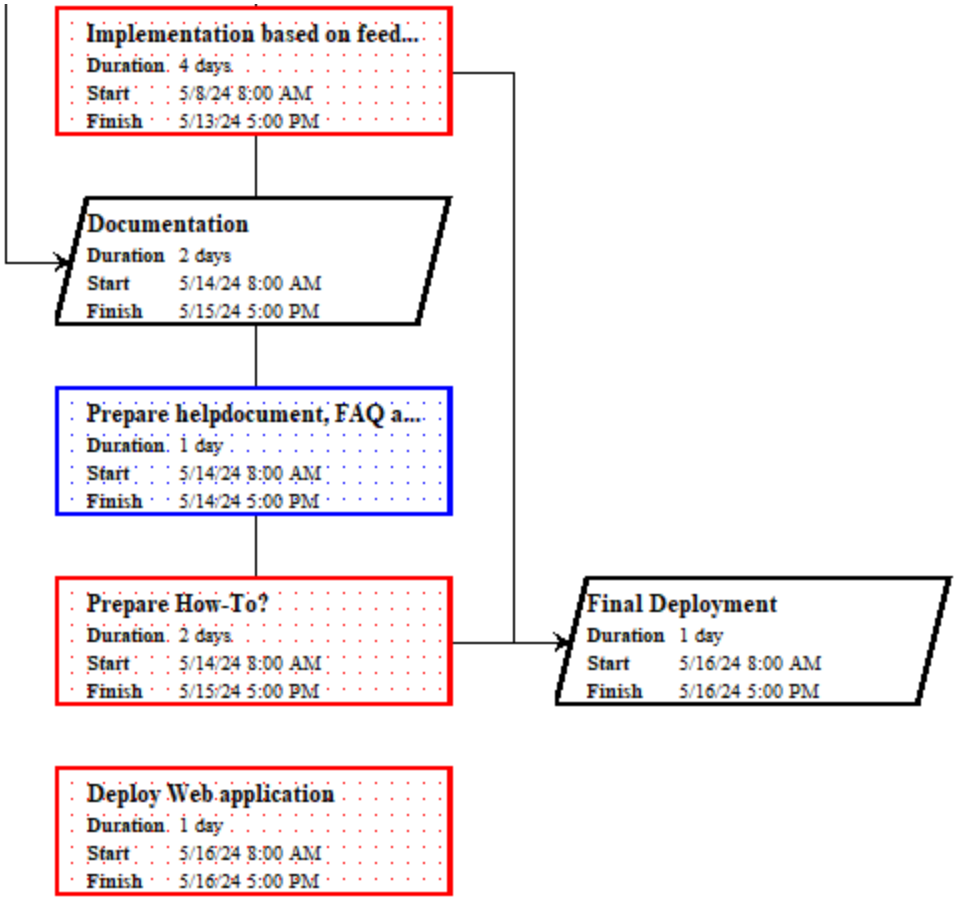


Figure 3.2.1.H Network Diagram - Continuation

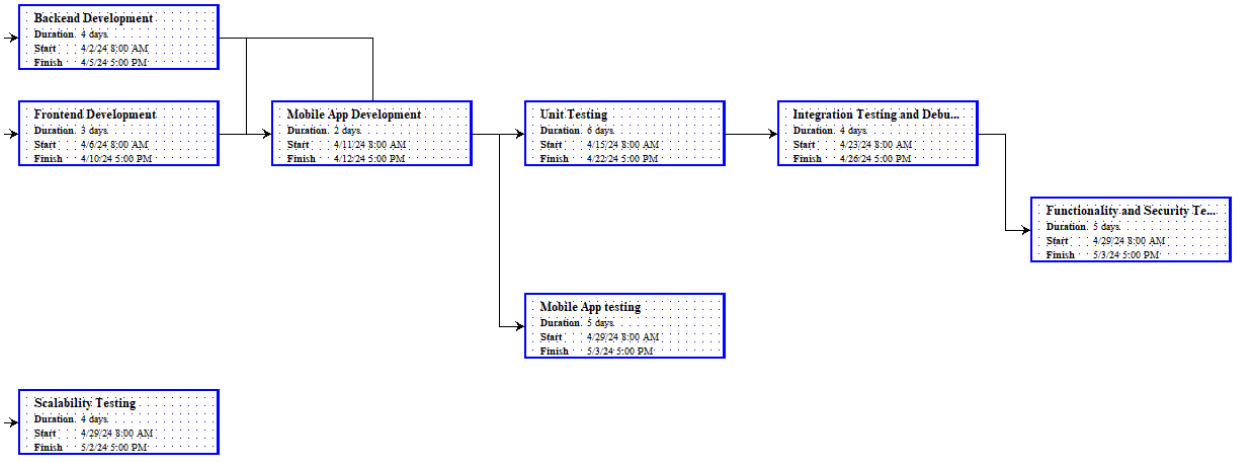


Figure 3.2.1.I Network Diagram - Continuation

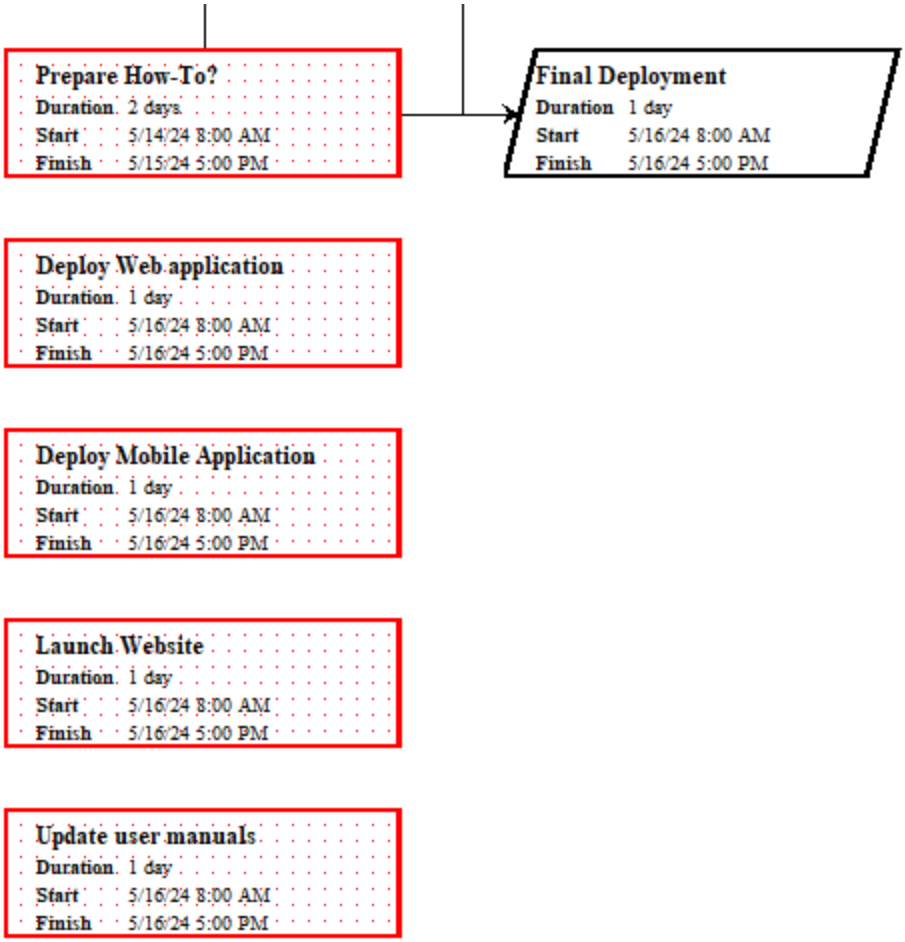


Figure 3.2.1.J Network Diagram - Continuation

3.3. Resource Allocation

We've made sure by efficiently allocating and scheduling the resources at our disposal. The success of the InteGreat project. These are some ProjectLibre screenshots.

Name	Initials	Max. Units	Cost Per Use	Standard Rate	Overtime Rate
Sai Ganapathy	SG	100%	$0.00	$60.00/hour	$20.00/hour
Sai Chandni	C	100%	$0.00	$55.00/hour	$20.00/hour
Ashmitha Pandeti	AP	100%	$0.00	$55.00/hour	$20.00/hour
Janhavi Chavan	JC	100%	$0.00	$50.00/hour	$20.00/hour
Hithansh Joshi	HJ	100%	$0.00	$50.00/hour	$20.00/hour

Figure 3.3.A Resource Allocation and Cost

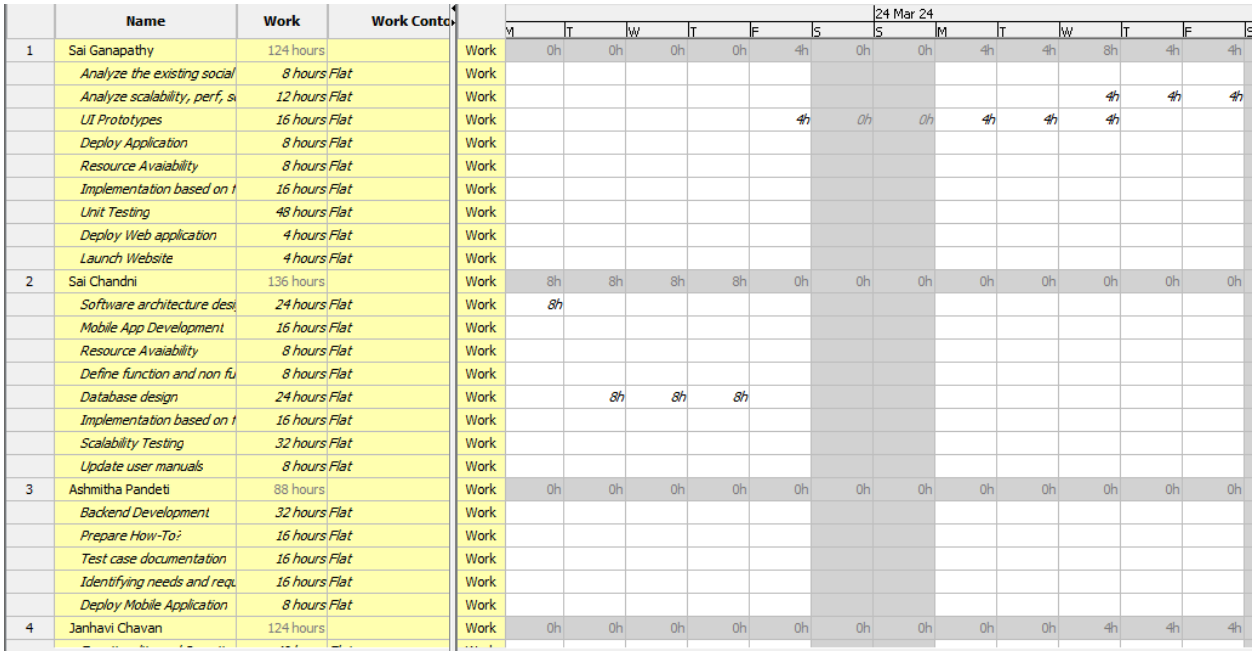
Resource Sheet

With the resource sheet, we can see details about InteGreat project resources and their assignments.

	Name	Work	Work Contour
1	Sai Ganapathy	124 hours	
	Analyze the existing social media platforms	*8 hours*	*Flat*
	Analyze scalability, perf, security, usability	*12 hours*	*Flat*
	UI Prototypes	*16 hours*	*Flat*
	Deploy Application	*8 hours*	*Flat*
	Resource Avaiability	*8 hours*	*Flat*
	Implementation based on feedback	*16 hours*	*Flat*
	Unit Testing	*48 hours*	*Flat*
	Deploy Web application	*4 hours*	*Flat*
	Launch Website	*4 hours*	*Flat*
2	Sai Chandni	136 hours	
	Software architecture design	*24 hours*	*Flat*
	Mobile App Development	*16 hours*	*Flat*
	Resource Avaiability	*8 hours*	*Flat*
	Define function and non functional requirements	*8 hours*	*Flat*
	Database design	*24 hours*	*Flat*
	Implementation based on feedback	*16 hours*	*Flat*
	Scalability Testing	*32 hours*	*Flat*
	Update user manuals	*8 hours*	*Flat*
3	Ashmitha Pandeti	88 hours	
	Backend Development	*32 hours*	*Flat*
	Prepare How-To?	*16 hours*	*Flat*
	Test case documentation	*16 hours*	*Flat*
	Identifying needs and requirement for the project	*16 hours*	*Flat*
	Deploy Mobile Application	*8 hours*	*Flat*
4	Janhavi Chavan	124 hours	
	Functionality and Security Testing	*40 hours*	*Flat*
	Integration Testing and Debugging	*32 hours*	*Flat*
	Check market demand	*16 hours*	*Flat*
	Identifying needs and requirement for the project	*16 hours*	*Flat*
	Analyze scalability, perf, security, usability	*12 hours*	*Flat*
	Deploy Web application	*4 hours*	*Flat*
	Launch Website	*4 hours*	*Flat*
5	Hithansh Joshi	136 hours	
	Assess the viability of the project	*16 hours*	*Flat*
	Monitor and Collect Feedback	*8 hours*	*Flat*
	Technical Complexity	*16 hours*	*Flat*
	Frontend Development	*24 hours*	*Flat*
	Mobile App testing	*40 hours*	*Flat*
	Prepare helpdocument, FAQ and Quicklinks	*8 hours*	*Flat*
	UI Prototypes	*16 hours*	*Flat*
	Deploy Mobile Application	*8 hours*	*Flat*

Figure 3.3.B Resource Allocation Table

Resource Usage



	Name	Work	Work Contc		24 Mar 24												
					M	T	W	T	F	S	S	M	T	W	T	F	S
1	Sai Ganapathy	124 hours		Work	0h	0h	0h	0h	4h	0h	0h	4h	4h	8h	4h	4h	
	Analyze the existing social	*8 hours*	*Flat*	Work													
	Analyze scalability, perf, s	*12 hours*	*Flat*	Work										4h	4h	4h	
	UI Prototypes	*16 hours*	*Flat*	Work					4h	0h	0h	4h	4h	4h			
	Deploy Application	*8 hours*	*Flat*	Work													
	Resource Avaiability	*8 hours*	*Flat*	Work													
	Implementation based on f	*16 hours*	*Flat*	Work													
	Unit Testing	*48 hours*	*Flat*	Work													
	Deploy Web application	*4 hours*	*Flat*	Work													
	Launch Website	*4 hours*	*Flat*	Work													
2	Sai Chandni	136 hours		Work	8h	8h	8h	8h	0h	0h	0h	0h	0h	0h	0h	0h	
	Software architecture desi	*24 hours*	*Flat*	Work	8h												
	Mobile App Development	*16 hours*	*Flat*	Work													
	Resource Avaiability	*8 hours*	*Flat*	Work													
	Define function and non fu	*8 hours*	*Flat*	Work													
	Database design	*24 hours*	*Flat*	Work		8h	8h	8h									
	Implementation based on f	*16 hours*	*Flat*	Work													
	Scalability Testing	*32 hours*	*Flat*	Work													
	Update user manuals	*8 hours*	*Flat*	Work													
3	Ashmitha Pandeti	88 hours		Work	0h	0h	0h	0h	0h	0h	0h	0h	0h	0h	0h	0h	
	Backend Development	*32 hours*	*Flat*	Work													
	Prepare How-To:	*16 hours*	*Flat*	Work													
	Test case documentation	*16 hours*	*Flat*	Work													
	Identifying needs and requ	*16 hours*	*Flat*	Work													
	Deploy Mobile Application	*8 hours*	*Flat*	Work													
4	Janhavi Chavan	124 hours		Work	0h	0h	0h	0h	0h	0h	0h	0h	0h	4h	4h	4h	

Figure 3.3.C Resource hour allocation

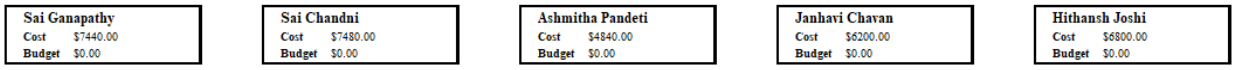


Figure 3.3.D Resource Breakdown Structure

Resource Usage Capacity Histograms

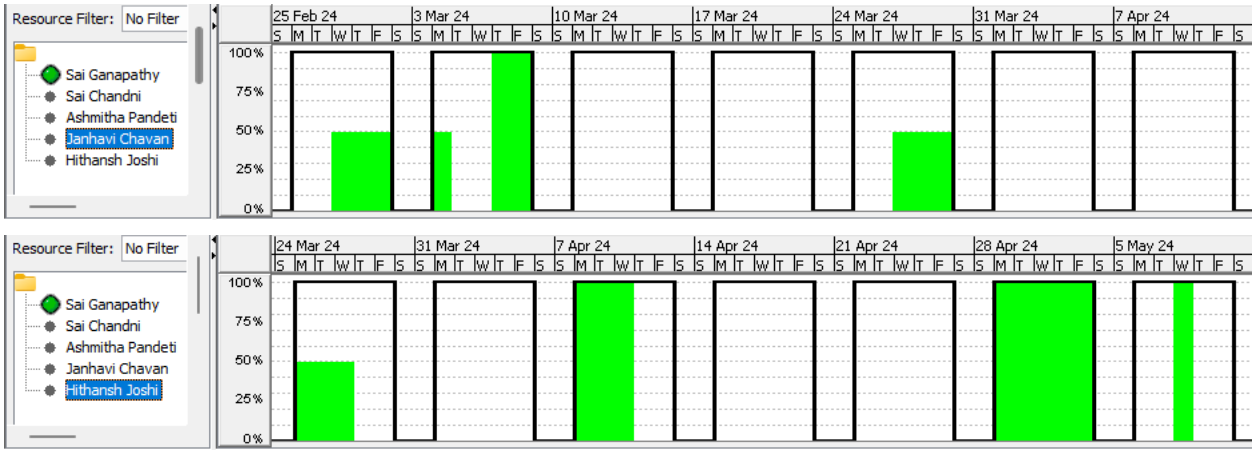


Figure 3.3.E Resource Usage Histograms

The histograms above show that no team member was overworked. Because of this. Our workflow is not constant so outsourcing work that peaks during could be a cost-cutting strategy. weeks when additional assistance is required. The project will gain new momentum from outside perspectives. It is easier to prevent team morale issues and burnout when there are no overutilized human resources participants.

4. Project Budget

4.1. Project Resources

In this section we outline the project estimate for project personnel resources. We detail the project cost associated with the individual's salary, overhead cost etc,.This breakdown will provide a clear understanding of the financial commitment required for the project personnels for successful project execution. We have assumed the overhead cost to be around 40%. See the below Figure 4.1.A for project resource budgeting.

Name	Title	Resource Type	Salary	Hourly Rate	Fully Loaded Rate*	Time (hrs/wk)	Duration (Weeks)	Cost
Ashmitha Pandeti	Product Manager	Tech Management	$105,000	$55	$77	8	11	$6,776
Hitansh Joshi	Data Analyst	Engineering (Data Science, Business Analytics)	$96,000	$50	$70	12	11	$9,240
Janhavi Chavan	Quality Analyst	Security and Testing	$96,000	$50	$70	11	11	$8,470
Sai Chandni Chellakumar	Software Developer	Core Engineering (Software and Database)	$105,000	$55	$77	12	11	$10,164

Name	Title	Resource Type	Salary	Hourly Rate	Fully Loaded Rate*	Time (hrs/wk)	Duration (Weeks)	Cost
Sai Ganapathy Swaminathan	Project Manager	Management	$115,000	$60	$84	11	11	$10,164
Note : Overhead cost has been calculated at 40%.								**Total $44,814**

Figure 4.1.A Project Resource table to showcase resource distribution

4.2. Other Costs

4.2.1. Hardware Costs

This hardware section costs will cover the costs of all the materials like computers and other equipment that are required for the development of the project. All the items that are bought in bulk will be listed at a discounted price. Please refer to the table 4.2.1.A for hardware components required and the cost for them.

Hardware Name	Details	Quantity	Cost/Item	Total Cost
Server	Dell PowerEdge R450 Rack Server	2	3,089$	7,178$
Workstation	Lenovo ThinkStation P3	10	1,002.82$	10,028.20$
Monitors and Other Accessories	Dell Monitor Bundle	10	200$	2,000$
Network Equipments	Router, Switch, Ethernet and WiFi Adapters, Firewall Fortigate Firewall Cisco Router, Switch, Ethernet Cables	5	350$	1,750$
Workspace Setup	Work desk and Chair	10	1,000$	10,000$
				Total 30,956$

Figure 4.2.1.A Hardware Cost Associated with the development of InteGreat

4.2.2. Software Costs

This project mainly requires software tools on a user-count basis or by licensing. AWS cloud services are billed as per hour usage. These below charges are an

estimation for development of the application and deployment. Tools like IDE require licenses that are bought from the vendor using the company's domain name and it can be used in any number of workstations and users for 1 year. When the user size (i.e employee count) of the org increases the software tools that are billed for the number of users will increase as per the count. Refer the below table 4.2.2.A for the softwares that will be used for this project and costs.

Software Name	Cost	Total Cost (Approximation)
Data Visualisation Tools - PowerBi	20$ / User / Month	300$
AWS - Cloud Computing Instances Subscriptions	0.1$ / hr usage	2,000$
AWS - Automation Testing Tools - Selenium	0.1$ / hr usage	2,000$
UI Design Tools - Figma, Adobe, LucidChart	25$ / User / Month	150$
Backend Development Tools - IDEs	778$ / Year	1,600$
Version Control Tools - GIT, Mercurial	Open-Source	0
Licensing for third-party dependencies	Open-Source	0
Project Management Tools Subscription - Libre	Open-Source	0
ITOM and ITSM Software - ServiceNow	250$ / User / Month	7,500$
Cybersecurity Tools - Wireshark, Postman, OWASP ZAP	Open-Source	0
Team Collaboration Tool - Slack, MSTeams	Free for < 5 member team	0
Database Systems - Oracle, PgSql	Open-Source	0
		Total: 13,550$

Figure 4.2.2.A Software Costs Associated with the development of InteGreat

4.3. Cost Estimate

The total cost estimation below in Fig. 4.2.3 covers the entire cost of the project from initiation phase to the deployment phase. The costs are estimates only and not the actual cost. The project will use a contingency amount of 20% of the estimated cost for the uncertain expenses or incidental expenses that may occur during the tenure of the project. Including the contingency the project cost is mentioned in the below table. This estimation is based on the price of hardware and software products at current market value. In addition, the operation costs and business travel cost of the project are also considered below as project cost along with contingency limit keeping the inflation prices in account. Please refer the below table for the overall

Type of Cost	Total Value
Human Resource	44,815$
Hardware	30,956$
Software	13,550$
Operational-Cost	15,000$
Business Travel	10,000$
Pre-Contingency Total	114,321$
Contingency (20%)	22,864$
Total Cost Estimation	**137,216$**

Figure 4.3.A Overall Cost Estimation

4.4. Time-Phased Budget

Time phased budget is an informative tool that represents the budget of the project split across the entire tenure. The monthly budget in the below Fig 4.4.A includes the hardware and software purchases and maintenance charges. The electricity, network connection , maintenance of office space, cleaning and maintenance charges and etc. are accounted for under the operations costs which are splitted across all the months along with the major milestone achievement of the project.

Time Phased Budget					
	Months				
Activity	February (1 Week)	March (4 weeks)	April (4 weeks)	May (3 weeks)	Totals
Data Gathering and Analysis	$6,883				6882.5
Resource Procurement	$30,956	$13,550			$44,506
Feasibility and POC		$9,283			$9,283
System Design		$5,985	$10,982		$16,966
Implementation - Backend			$6,271	$11,210	17480
Implementation - UI/UX			$4,771	$7,720	12490
Testing and Security Analysis			$6,229	$5,936	12164
Beta Release				$7,683	7682.5
Documentation				$5,282	5281.5
Final Deployment				$4,482	4481.5
					137216.5

Figure 4.4.A Time Phased Budget Estimates

5. Communications Management

5.1. Communications Management Plan

In project management, a communication management plan explains how communication will take place during the project. It involves identifying stakeholders, setting goals, defining channels and frequency of communication, assigning roles, establishing escalation processes and feedback mechanisms among other things. This ensures that there is transparent, timely and efficient communication for the success of the project. Effective communication is vital for any business to thrive, hence this aspect of Communication Management ensures that an appropriate message is delivered to the intended recipients through suitable medium at appropriate moment. Fig 5.1.A shows the detailed communication plan for our project.

Purpose of Communication	Schedule Frequency	Media or Mechanism Used	Called By	Participants
Daily Stand-Up Meetings	Daily (15 minutes)	Virtual	Project Manager	Required Project Team Members
Weekly Stakeholder Meetings	Weekly	Virtual / In Person	Project Manager	Project Team Members & Clients
Review Meetings	End of Milestones	Virtual / In Person	Team Leads	Team Leads & Team Members
Monthly Project Updates	Monthly	Virtual / In Person	Project Manager	Project Manager, Team Leads & Clients
Quarterly Project Updates	Quarterly	Virtual / In Person	Client Manager	Client Manager, Project Manager & Leadership
Conflict Resolution Meetings	As needed	Virtual / In Person	Team Leads/ Project Manager	Required Team Leads , Team Members & Leadership
Go or No-Go Meeting	As needed (Before Deployment)	In Person	Project Manager	All Team Leads, Project Manager & Client
Product Demo Meetings	As needed (Before/After Launch)	Conference Halls	Project Manager	All Team Members, clients and customers
Post Moterm/ Lessons Learnt Meeting	As needed(After Launch)	Conference Halls	Project Manager	All Team Members

Fig 5.1.A Communication Management Plan

6. Tracking and Status Update

6.1. Tracking Method

Tracking involves following individual activities within a project to ensure their timely completion within the budget while milestone tracking provides significant points of reference for success of timeframes. Progress reporting enhances transparency and cohesion by sharing accomplishments, challenges faced and deadlines coming up soonest, among other things. It should be noted that problem solving is made easier when there is issue identification alongside risk management since this helps in tackling them early enough before they escalate into disruptions hence saving time as well as resources. Project managers can take care of problems before they occur if they continuously monitor the status and updates while at the same time pointing projects towards successful completion.Fig 6.1.A shows different tracking methods to track our Milestones.

Event	Milestone	Milestone Meeting Date
Milestone 1	Requirement Gathering and Analysis	28-Feb-24
Milestone 2	Feasibility Study	05-Mar-24
Milestone 3	System Design	14-Mar-24
Milestone 4	Implementation	02-Apr-24
Milestone 5	Validation	29-Apr-24
Milestone 6	Beta Release	07-May-24
Milestone 7	Documentation	14-May-24
Milestone 8	Final Deployment	16-May-24
Milestone 9	Maintenance and Support	16-May-24

Fig 6.1.A Milestone Tracking Plan

6.2. Notification Record

6.2.1. Communication

In project management, it is important to communicate well so that all people involved know what's going on with regard to things like budget and current state of the project. A project manager bridges the gap between the team and stakeholders. They need to facilitate communication effectively. They should be able to deliver briefs on financial updates and progress made so far in terms of project completion, among other things, to everyone and the leadership. This may require regular meetings, report writing, power point presentation creation and

sending emails back and forth between members within different organizations until information reaches those who need it most.

6.2.2. Updating Records

In order to have transparent Communication and stay updated, all tasks should be in the records usually through email. This way there is a complete storage of relevant information about the project which can be referred to whenever necessary. Furthermore, these records need constant updating so as to reflect new advances, determinations and agreements made.Project managers are able to follow up on the progress of the project because of these documents and records detect any inconsistencies or problems and also ensure that every member of staff and stakeholder is provided with correct details which are up-to-date.

6.2.3. Sign Off

In communication, getting approval from all interested parties and top management is very important. This means formally recognizing and accepting project deliverables, decisions or even events considered to be of great value. Managers do this to ensure that stakeholders are involved and stay focused on the goals & objectives set for the project. It also makes them accountable because they now own up to what they have done or been assigned as their responsibility during execution stages etcetera. Sometimes sign offs happen at different points such as initiating projects, reaching key points during implementation phase or closing down projects altogether which keeps everyone informed

6.3. Control Systems

The Control systems that we will use for our project are as follows.

1. **Control of configuration:** A management plan for configuration will be made and kept under constant surveillance. All versions of control will be monitored, and records shall be maintained. Configuration must be reviewed frequently and audited.
2. **Control by design:** Conduct in-depth examinations on the design to see if it conforms with requirements. Keep updating the design through constant audits on designs when new versions come up.
3. **Monitoring trends:** Establish indicators and metrics to monitor performance and progress of projects regularly analyze performance information for trends, anomalies or variations from expected results.
4. **Controlling documents:** Review project documents periodically to verify their accuracy, relevance, and compliance with project specifications. Add all files into structured folders while granting access rights to necessary team members or stakeholders.
5. **Procurement Control:** Monitor project equipment, materials or services required for development or implementation.

6. **Specification Control:** Regularly evaluate whether the deliverables meet defined specifications during this phase so as to ensure compliance as well as quality assurance.

7. Project Closeout

7.1. Closeout Accounts

When the project was first planned all financial information was taken care of (See Figure 3.2.1.A) and completed when the project was finished.

7.2. Lessons Learned

Throughout the duration of this project, many important lessons were acquired. Our main objective at the project's onset was to deliver a service that would meet our customer's expectations satisfactorily. Understanding the inevitability of encountering obstacles, we made proactive efforts to anticipate and address them.

1. **Challenges and Solutions (Exceptions) :** Expecting difficulties like delays in finishing a task. As predicted these kinds of incidents did happen. That being said, they didn't stop us from achieving our goal. Aligning our understanding with the customers can be challenging especially when it comes to software version licensing. Nevertheless, we were able to resolve this discussion while staying within our financial restriction.
2. **Mitigation Strategies:** We put in place a check-and-balances system to stop problems from getting worse. To quickly address customer concerns and offer practical solutions our leadership worked closely with managers and employees. Maintaining a strict schedule was also essential for preventing any setbacks.
3. **Success Evaluation:** Even though there were obstacles to overcome we finished the project on schedule. Even though we fell short of our goal exactly, we still made progress. Our pre-planned mitigation strategies worked well which helped us overcome most of the obstacles we faced. Incentives also ensured that our team members remained enthusiastic and committed.
4. **Recommendations for the Future:** Moving forward we want to streamline our procedures by developing software templates for projects that we have planned. By pre-selecting software solutions and customizing them to meet unique company requirements we anticipate significant time savings and increased efficiency in product delivery. In the future this strategic approach will be a great place to start as it will enable greater customer satisfaction and smooth project execution.

7.3. Integrated Project Plan Lessons Learned

During this group project of developing the Project Proposals we have encountered many difficulties and overcame them with sheer understanding between the team members and the use of PMI guidelines, Books and Articles mentioned in the reference section. Below are a few lessons that we have learned during this project.

1. The technical skills about Software development life cycle (SDLC) need to be known prior to planning a software project

2. The Project risks can only be understood by referring different case studies and the mitigation steps need to be formed by brainstorming session by the team
3. The budgeting of the project needs extensive analysis on product suitable for the project and their costs in the current market
4. Lerant to use project management tools like ProjectLibre and other techniques like Gantt chart , Network Diagram , Critical Path , etc.
5. Team coordination and performing as a team
6. Leadership skills
7. Learnt how to plan a project from start to end keeping the risks accountable

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